STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION

# BID PROPOSAL

# CONTRACT T202104204

# HEP KC, SR15/KENTON RD. AT CENTRAL CHURCH RD. INTERSECTION IMPROVEMENTS

Advertisement Date: January 13, 2026

**INCLUDED IN THIS DOCUMENT:**

**BID PROPOSAL:**
*GENERAL DESCRIPTION*
*PROSPECTIVE BIDDER'S NOTES*
*GENERAL NOTICES*
*PREVAILING WAGES*
*SPECIAL PROVISIONS*
*STATEMENTS*
*SAMPLE AFFIDAVIT - CRAFT TRAINING*
*QUANTITY SHEET SUMMARY*

**ADDITIONAL BID PROPOSAL ITEMS:**

**ATTACHED OR POSTED DOCUMENTS:**
*PROJECT PLANS*
*QUESTIONS & ANSWERS (if posted)*
*BREAKOUT SHEETS*
*DIESEL FUEL FORM*

**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, for subscribers bidx.com/de/

**Internet Bids** for Bidders with Bid Express® accounts can be submitted at 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, FEBRUARY 10, 2026**

## GENERAL DESCRIPTION

**A. BIDS DUE: FEBRUARY 10, 2026 PRIOR TO 2:00 P.M. Local Time** – unless changed via Addendum.

**BIDS MUST BE SUBMITTED VIA**:

**(a) Internet -** Bidders with DelDOT Bid Express® accounts can submit bids at bidx.com/de/.
**OR:**
**(b) Paper Bid Delivered To:** Delaware Department of Transportation, Administration Building
North Entrance, Bidders Room, 800 Bay Road, Dover, DE 19901

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 deliver in a sealed envelope; the Bid Form, completed CD, and 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 and documents will be rejected.*

**BID OPENING:** Bids will be publicly opened and read aloud at the Date and Time of the Bid Opening. The Bid Opening will be held at the 'Paper Bid Delivered To' address shown above. Bidder bears the risk of late delivery, bids received after the stated time will be returned unopened.

**NEW** 

Attendance is not required. DelDOT offers a call-in number to hear the Bid Opening telephonically.
The telephone number to call is (302) 504-8986.
When prompted, enter Meeting number (access code): 651 529 280#
It is anticipated the telephone access information will remain the same for all Bid Openings.

**B. PRE-BID MEETING: No**

**C. LOCATION:** Kent County
These improvements are more specifically shown on the Location Map(s) of the attached Plans.

**D. DESCRIPTION:** The improvements consist of furnishing all labor and materials for intersection improvements which involves construction plan development for a proposed new roundabout at the intersection of Kenton Road (K104) and Central Church Road (K155). The project area extends approximately 550 feet from the intersection along all four legs. The project is in Dover, Kent County, Delaware. The purpose of this project is to increase safety and improve traffic operations at the intersection of Central Church Road and Kenton Road. The proposed improvements involve construction of a roundabout to replace an existing 4-way stop, minor utility relocations, and installation of a new open and closed drainage system. Follow other incidental construction in accordance with the location, notes and details shown on the plans, and as directed by the Engineer.

**E. COMPLETION TIME:** All work on this contract must be complete within 99 Calendar Days.
Extensions of contract time due to weather are specified in the Standard Specifications Section 108.7F, weather days.
It is estimated a Notice to Proceed is issued such that work starts on or about April 20, 2026.

**F. SPECIFICATIONS** FOR ROAD AND BRIDGE CONSTRUCTION, DELAWARE DEPARTMENT OF TRANSPORTATION, JANUARY 2024 apply to this Bid Proposal and Project. The Contractor shall make himself aware of any revisions and corrections and apply them to the applicable item(s) of this contract. The Standard Specifications can be viewed here. Units of Measure can be found at 101.4.

**G. ATTACHMENTS:** Included as part of this Bid Proposal are; *Project Plans*; *Questions & Answers* (if posted); *Addenda* (if issued), *Referenced Documents, Documents Posted with this Bid Proposal*; and *Bid documents mailed to contractors.*

**H. 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.

**I. 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.

**J. ROAD USER COSTS:**

## FAILURE TO OPEN PROJECT TO UNRESTRICTED HIGHWAY TRAFFIC ON TIME

**Late Opening of Temporary Lane Closures**

Interim Road User Costs (RUC) for delays in opening lanes will be assessed according to the below chart(s). Refer to the Allowable Lane Closure matrix(icies) in the Maintenance of Traffic (MOT) plans for start and end times of allowable lane closures.

**Table 1**

| Kenton Road and Central Church Road | |
|---|---|
| Time All Lanes Reopened After End of Allowable Lane Closure Hours | Road User Cost |
| 1st 15-minute increment | $38 |
| 2nd 15-minute increment | $76 |
| 3rd 15-minute increment | $114 |
| 4th 15-minute increment | $152 |
| 5th 15-minute increment | $190 |
| 6th 15-minute increment | $228 |
| 7th 15-minute increment | $266 |
| 8th 15-minute increment | $304 |
| **After the first two hours beyond the allowable lane closure hour limit, RUC will accrue at $38 per 15min, up to a day total of $1,824. The RUC values within the chart are not cumulative, payments made after the first two hours are.* | |

Examples of calculation for Assessment of Road User Cost:

1) Failure to reopen Kenton Road until 8:05 PM, during the 5th 15-minute increment, local time:

   Per Table 1 a RUC of $190 will be assessed.

2) Failure to reopen Central Church Road until 10:20 PM, local time:

   Per Table 1, a RUC of $532 will be assessed.
   - 7:00 PM – 8:59 PM = $304 for the first two-hour period
   - 9:00 PM – 10:20 PM = $38 x (6) 15min increments = $228

Assessment of the RUC will be made through Item 763525 – Road User Cost. The Engineer will be the sole approving authority as to when the project is complete after traffic is returned to the ultimate alignment and when the contractors work activities will permit highway traffic ultimate lane width and shoulder widths.

A RUC of $31,000 will be assessed for each calendar day that the intersection of Kenton Rd. and Central Church Rd. is not fully opened to traffic. The full daily RUC is assessed regardless of what time of day the roadway or ramp is reopened, starting at 12:00 AM. As such, no consideration will be given for partial calendar days.

Example of calculation for assessment of Road User Cost:

The duration of the Phase 2 detour according to the Plans is 27 calendar days. If the roadway is reopened at 12:05 AM on day 28, the full amount of the $31,000 RUC will be assessed.

Assessment of the RUC will be made through Item 763525 – Road User Cost. The Engineer will be the sole approving authority as to when the project is complete after traffic is returned to the ultimate alignment and when the contractors work activities will permit highway traffic ultimate lane width and shoulder widths.

## K. FLAGGERS:

A. Included in the Bid Proposal are the prevailing wages for highway construction 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.
B. Flaggers must be bid at a minimum equal to the Laborer wage rate and may be bid up to, but not to exceed, 3 times the Laborer wage rate in accordance with the County where the Work is being performed.
C. The Department will adjust the bid to the minimum for prices bid below the minimum acceptable bid and to the maximum for prices bid above the maximum allowable bid prior to award of the Contract.
    1. Flagger overtime must be bid at minimum of 1.45 times and may be bid up to a maximum of 4.35 times, the Laborer wage rate in accordance with the County where the Work is being performed.
    2. When a Contract for a Project contains both Federal Davis-Bacon and State of Delaware prevailing wage standards, the employer's minimum wage obligations are determined by whichever standards are higher.
D. Overtime:
    1. Payment for overtime will be considered on a weekly basis for time worked in excess of 40 hours for a continuous 7-day period beginning Monday and ending Sunday inclusive.
    2. Time worked on other Projects or Work activities other than flagging will not be counted in the normal 40 hours or the overtime.
E. The cost of the flagging operation when performed by others who are not the Contractor's employees will not be included in the 50% subcontracting limit as outlined in Section 108.1.

## L. PROSPECTIVE BIDDERS NOTES:

### 1. CRAFT TRAINING REQUIREMENT (29 Del. C. §6960A)

a) The awarded contractor must include a craft training program for each craft in the project if at the time the contractor executes the contract, all of the following apply:

1. This project requires prevailing wages.
2. The contractor employs 10 or more total employees.
3. This project is not a federal highway project (except for the US 301 project from the MD-DE state line to SR1).
4. There is an apprenticeship program for a craft in the project on the list provided by the Delaware Department of Labor.

b) The awarded contractor must commit that all subcontractors provide craft training if the above applies to the subcontractor.

c) The contractor must satisfy the craft training requirement before the contract is executed. A contractor or subcontractor may satisfy the craft training requirement by doing any of the following for each craft required:

1. Having at least 1 active apprentice in a craft training program for the craft.
2. Having at least 1 active apprentice who completes a craft training program for the craft within the 6 months before the date the contract was executed.

3. Being a member of a consortium that provides craft training for the craft and all of the following apply to the craft training program for the craft:
   (a). The consortium requires a regular financial contribution.
   (b). The contractor or subcontractor has access to the craft training program.
   (c). There is at least 1 active apprentice in the craft training program.
4. Making a payment under paragraph (e) of this section.

d) The craft training program under above paragraphs c)1. and c)2. may be provided by the contractor or subcontractor or through agreement with another entity.

The active apprentice under paragraphs c)1. and c)2. does not have to work on this project.

e) A contractor or subcontractor may satisfy the craft training requirement by making a payment in the amount established under § 204 of Title 19, for the craft into the Apprenticeship and Training Fund of the Department Labor. For each calendar year, a contractor or subcontractor satisfies the craft training requirement for all contracts executed during that year when payments made after January 1 equal the following amounts:

1. For employers with 10 through 25 employees, payments that total $10,000.
2. For employers with more than 25 employees, payments that total $20,000.

f) PENALTY: If the successful bidder fails to comply with the Craft Training Requirements:

1. The contractor must pay the amount of the payment required under paragraph e) above to the Apprenticeship and Training Fund.
2. An amount that does not exceed 10 percent of the payment under paragraph f)1. of this section.
3. A penalty assessed under paragraph f)1. may be fully or partially remitted or refunded by the agency awarding the contract only if the contractor establishes compliance within 60 days of the notice of the penalty. A claim for remission or refund of a penalty may only be granted if an application for the remission or refund is filed within 1 year of the notice of the penalty.
4. Any contractor or subcontractor who fails to provide required craft training under 29 Del. C. § 6960A may be subject to suspension or debarment.

**2.** **BIDDERS MUST BE REGISTERED** with DelDOT in order to submit a bid. Registrations are now completed online through SimpliGov. To complete registration or for more information, click here.

**3.** **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.

**4.** **DELAWARE'S CONTRACTOR REGISTRATION ACT** - 19 Del.C. §§ 3601 *et seq*, requires all contractors and subcontractors to register with the Delaware Department of Labor before performing construction services or maintenance. Refer to the GENERAL NOTICES section for further information.

**5.** **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.

6. **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.

7. **NO RETAINAGE** will be withheld on this contract unless through the Performance-Based Rating System.

8. **EXTERNAL COMPLAINT PROCEDURE** can be viewed on DelDOT's Website, Contractor Compliance/EEO - Delaware Department of Transportation or request a copy by calling (302) 760-2555.

9. **DELAWARE BUSINESS LICENSE;** a copy of your firm's Business License must be submitted with your bid.

10. **FLATWORK CONCRETE** TECHNICIAN CERTIFICATION TRAINING:
    Section 501.3, 503.3, 505.3, 610.3, 701.3 and 702.3 of the 2024 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.

11. **BREAKOUT SHEETS** MUST be submitted with your bid documents. Attach the breakout sheet(s) to the proposal. Failure to submit the breakout sheet with the proposal will result in the Department declaring the proposal as non-responsive and rejecting the bid.

12. **SIGNAGE LANGUAGE**:
    In order to maintain effective communication with the traveling public, only place signs, banners, flags, or other displays within the projects limits that meet the requirements of the latest version of the Delaware Manual on Uniform Traffic Control Devices. Any signs or other materials which deviate from the MUTCD, must be preapproved by the Engineer. The only signage and materials which may be displayed upon vehicles and equipment within the Project area are signs denoting the name of the Contractor and any subcontractors and other signs and/or materials required and approved pursuant to the MUTCD and the Engineer. Contractor shall immediately remove any signs or materials within the Project that does not meet these requirements immediately upon notification by the Engineer. Failure to remove signs or other materials following notification from the Engineer will result in Liquidated Damages being assessed in the manner and amount specified in the Standard Specifications section 108.9.A.

13. **DIESEL FUEL COST PRICE ADJUSTMENT FORM** is posted and part of this Bid Proposal.

14. **APPENDIX B – TECHNICAL SPECIFICATIONS** for Tidewater Utilities Waterline Work are posted and part of this Bid Proposal.

*- end –*

*remainder of page is blank*

## GENERAL NOTICES

CONTRACTOR REGISTRATION ACT

On July 1, 2021, the Contractor Registration Act, as codified in 19 Del.C. §§ 3601 *et seq,* took effect. This law requires all contractors to register with the Delaware Department of Labor before performing construction services or maintenance. The Contractor Registration Act applies to all contractors that engage in construction and maintenance within the State of Delaware. Additionally, it requires contractors to have Delaware workers' compensation insurance where required, compliance with labor laws, and proof of a state business license. The Delaware Department of Labor's Office of Contractor Registration is responsible for enforcement of the requirements of the Contractor Registration Act. If you have any questions about the contractor registration process, please call 302-430-7739 or email Contract.Registry@delaware.gov. Registration at https://onestop.delaware.gov/.

SPECIFICATIONS :

The Delaware specifications entitled "*Standard Specifications for Road and Bridge Construction January, 2024*", hereinafter referred to as the *Standard Specifications*; and *Revisions* 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.

The Department requires the use of various electronic applications for various documentation processes.
These processes will be identified, and the Contractor's required use will be detailed during the Preconstruction Meeting.
No additional payments will be made to the contractor to use or interface with the applications.

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.

PREFERENCE FOR DELAWARE LABOR:

Delaware Code, Title 29, Chapter 69, Section 6962, Paragraph (d), Subsection (4)b: "In the construction of all public works for the State or any political subdivision thereof, or by firms contracting with the State or any political subdivision thereof, preference in employment of laborers, workmen or mechanics shall be given to bona fide legal citizens of the State who have established citizenship by residence of at least 90 days in the State. Each public works contract for the construction of public works for the State or any political subdivision thereof shall contain a stipulation that any person, company or corporation who violates this section shall pay a penalty to the Secretary of Finance equal to the amount of compensation paid to any person in violation of this section."

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 shall obtain a license upon making application to the Division of Revenue.

CONTRACTOR / SUBCONTRACTOR LICENSE: 29 DEL. C. §6967:

(b) No agency shall accept a proposal for a public works contract unless such contractor has provided a proper and current copy of its occupational and/or business license, as required by Title 30, to such agency.

(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 of 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.

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)

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 DELAWARE 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 [Delaware] 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."

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) 318-2769

Mailing Address:
252 Chapman Road
Suite 210
Newark, DE 19702

Located at:
252 Chapman Road
Suite 210
Newark, DE 19702

PREVAILING WAGES FOR **HIGHWAY CONSTRUCTION** EFFECTIVE MARCH 14, 2025

| CLASSIFICATION | NEW CASTLE | KENT | SUSSEX |
|---|---|---|---|
| BRICKLAYERS | 66.79 | 66.79 | 71.09 |
| CARPENTERS | 67.79 | 62.56 | 50.80 |
| CEMENT FINISHERS | 72.72 | 44.60 | 45.46 |
| ELECTRICAL LINE WORKERS | 36.72 | 59.33 | 29.04 |
| ELECTRICIANS | 83.92 | 83.92 | 83.92 |
| IRON WORKERS | 89.37 | 32.59 | 34.62 |
| LABORERS | 56.58 | 52.08 | 51.11 |
| MILLWRIGHTS | 22.01 | 21.36 | 18.46 |
| PAINTERS | 83.14 | 83.14 | 83.14 |
| PILEDRIVERS | 98.33 | 32.46 | 91.23 |
| POWER EQUIPMENT OPERATORS | 84.74 | 54.11 | 49.57 |
| SHEET METAL WORKERS | 31.09 | 27.76 | 25.12 |
| TRUCK DRIVERS | 53.26 | 38.59 | 48.99 |

CERTIFIED: 12/31/2025 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) 318-2769.

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

**PROJECT: T202104204 HEP KC SR15 Kenton Rd. at Central Church Rd. Intersection Improvements Kent County, Kent County**

# SPECIAL PROVISIONS

| S.P. Code | SPECIAL PROVISION DESCRIPTION |
|---|---|
| 202514-20 | PIEZOMETERS |
| 401502-20 | ASPHALT CEMENT COST ADJUSTMENT |
| 401510-20 | TACK COAT |
| 401580-20 | RIDE QUALITY OF BITUMINOUS PAVEMENT |
| 401699-20 | QUALITY CONTROL/QUALITY ASSURANCE OF BITUMINOUS CONCRETE |
| 602505-20 | PERSONNEL SAFETY GRATE |
| 705521-20 | PATTERNED PORTLAND CEMENT CONCRETE SIDEWALK, 8" |
| 707500-20 | CHANNEL BED FILL |
| 710601-20 | INSTALLATION OF WATER MAINS AND ACCESSORIES, TW |
| 763501-20 | CONSTRUCTION ENGINEERING |
| 763520-20 | ELECTRONIC TICKETING |
| 763525-20 | ROAD USER COST |
| 763598-20 | FIELD OFFICE, SPECIAL I |
| 763626-20 | DIESEL FUEL COST PRICE ADJUSTMENT |
| 806500-20 | TRAFFIC OFFICERS |
| 850521-20 | LUMINAIRE (LED), 250 WATTS, HPS EQUIVALENT |
| 908503-20 | WETLAND MITIGATION GRASS SEEDING |
| 908524-20 | CONCRETE BLOCK LINING |
| 908527-20 | REFORESTATION |

# 202507 - INCLINOMETERS

# 202514 - PIEZOMETERS

# 202516 - MULTIPOINT BOREHOLE EXTENSOMETER (MPBX)

# 202517 - SETTLEMENT PLATFORM

# 202518 - SETTLEMENT MONUMENT

## Description.

This work consists of providing, installing, reading, protecting, and maintaining required instrumentation for data collection, and reporting the data from each instrument.

## Project Conditions.

A. Prior to bidding, visit and examine the work site and all conditions thereon and take into consideration all such conditions that may affect this work, in accordance with Section 102.5. Subsurface data collected from the site is available in geotechnical reports upon request from the engineer.

B. Protection of Existing Structures:
    1. Protect existing structures, underground utilities, and other construction from any possible or potential damage during drilling operations.

## Submittals.

A. Qualifying Experience
    1. Submit proof of 3 or more projects of similar size and complexity on which the firm and personnel assigned to the project have successfully installed similar instrumentation within the last three years. Present the following information for each project listed as a reference at or prior to any preconstruction meetings:
        a. Project Name, Location, Project Description, and Completion Date.
        b. Surface and Subsurface Conditions.
        c. Type and number of instruments installed.
        d. Installation equipment and techniques utilized when applicable.
        e. Provide names, current phone numbers, and current business addresses for the owner/designer, geotechnical consultant, and contract manager.

B. Geotechnical Instrumentation Monitoring (GIMS) Plan
    1. No instrumentation shall be delivered or installed on the site prior to the review and approval by the engineer of the materials, products, and installation procedures presented in the (GIMS).

2. Submit the following to the engineer for review at least 45-calendar days prior to proceeding with installation work:
    a. Schedule and Procedures:
        i. Proposed schedule and procedures for instrumentation installation and performance of initial baseline readings and monitoring of the instruments. Detailed step-by-step procedure for installation, together with a sample installation record sheet. Bind and index the procedures for each instrument. For instruments that are installed through a borehole, include the following in the installation procedures:
            (1.) The method to be used for cleaning the inside of casing for instruments installed in boreholes.
            (2.) The methods to be used for drilling of holes.
            (3.) Drill casing type and size.
            (4.) Depth increments for backfilling boreholes with sand and grout, as applicable.
            (5.) Method for overcoming buoyancy of instrumentation components during installation in borehole.
            (6.) Method for sealing of joints in pipes and inclinometer casing to prevent ingress of grout.
        ii. Detailed step-by-step procedures developed in conjunction with the engineer for conducting all survey measurements to obtain initial baseline readings to the specified accuracy, including types of surveying equipment.
    b. Product Data:
        i. Manufacturer's catalog cuts, shop drawings, material specifications, installation and maintenance instructions, and other data pertinent to the work of this section.
    c. Grout Mix:
        i. Material specifications and mix designs for grout required for piezometer, extensometer, and inclinometer installations along with verification from a certified testing laboratory that this mix is in accordance with the requirements specified. Include specifications for proposed grout mixes, commercial names, proportions of admixtures and water, mixing sequence, mixing methods and duration, pumping methods and tremie pipe type, size and quantity.

C. Installation Submittal
    1. Within 5-workdays of receipt of each instrument at the site, submit to the engineer a copy of factory calibration, manufacturer's test equipment certification, completed copy of quality assurance checklist, and warranty for each portable readout unit.

2. Certifications:
    a. Manufacturer's certifications that products, materials, and equipment furnished meet the specified requirements.
3. Instrumentation layout and installation details:
    a. Submit the following within 5-days of installing each instrument:
        i. Instrument type, identification numbers and locations, with initial elevations, stations and offsets, and coordinates, as applicable for each instrument.
        ii. As-built installation details of each instrument, including depths, lengths, elevations, materials used, and dimensions of key elements.
        iii. A separate statement describing the procedure used for the installation of each instrument.
        iv. A log of subsurface data indicating the elevations of strata changes encountered in the borehole. Soil strata nomenclature shall conform to ASTM D2488.
        v. Other data pertinent to instrument installation.

**Schedule for Installations and Readings.**

A. Prior to installation of the instruments, submit an installation schedule as described in this specification. The installation of all instruments must generally precede the placement of embankment material by at least 14-days so that neutral, or initial baseline readings can be obtained. Notify the engineer within 24- hours of successful installation of each instrument.

B. Take baseline readings on extensometers, settlement platforms and monuments within 72-hours of successful installation of the instrument. Perform a spiral check and confirmation of groove alignment for inclinometers within 72-hours of installation. Take inclinometer and piezometer baseline readings after allowing grout to cure for 5-7 days and again 24-to 72-hours afterwards to verify the initial data.

C. Readings shall be collected at a minimum frequency as follows:
    1. Vibrating Wire Piezometers – hourly (if required).
    2. Inclinometers – twice a week during active construction and weekly following construction until primary consolidation is considered complete and horizontal deflection has stopped and as indicated in the Plans. Maintain access to inclinometers for purposes of long-term readings. Readings shall be coordinated with those from the settlement platforms so that these coincide on the same day.
    3. Multipoint Borehole Extensometers –daily during construction and weekly following construction until primary consolidation is considered to be complete.
    4. Settlement Plates and Monuments – twice a week during active construction and weekly following construction until primary consolidation is considered to be complete. Record and report elevation of embankment fill at each monitoring station on a weekly basis.

D. Protection of Instrumentation and Repair of Damage - Take the following measures to protect the installed instrumentation and repair any damages which occur:

1. Protect all instruments and appurtenant fixtures, leads, connections, and other components of instrumentation systems from damage due to construction operations.
2. If an instrument is damaged or made inoperative due to operations or the operation of subcontractors, notify the engineer immediately. The engineer will be the sole judge of whether repair or replacement is required.
3. Repair or replace damaged instruments within 24-hours of initial damage. Construction operations in the area of a damaged instrument(s) may be halted as directed by the engineer, until replacement of each damaged instrument is complete.

**Interpretation of Data and Implementation of Plans of Action.**

A. The engineer may require a temporary delay from planned construction schedules before a stage of fill placement is commenced and/or completed in a given area if the instrumentation readings indicate the potential for unstable conditions or if settlement exceeds the maximum estimated settlement indicated in the Plans. Resume fill placement as directed by the engineer when instrumentation readings indicate sufficient stability has been achieved. Record all data in the following form:
    1. Present raw and reduced data in tabular format.
    2. Plot reduced data for up to 6 like instruments that are located in the same geographical area on the same graphical plot.
    3. Data plots for piezometers, extensometers, and settlement plates shall present reduced data versus time and the height or elevation of fill placed in the vicinity of the sensors will be noted with each plot.
    4. Sign data reports prepared by the Contractor by either a Professional Engineer or Professional Land Surveyor licensed in the State of Delaware.

**Quality Control.**

A. Follow the measures below prior to and during the installation of the instrumentation to ensure proper installation and operation:
    1. Control of Materials
        a. The materials to be used in fulfilling the requirements of instrumentation work are subject to the approval of the engineer. Approval of the materials to be used for instrumentation do not relieve the contractor of the responsibility to provide instrumentation in accordance with these specifications.
        b. Inspect, test, and approve the workmanship of the instrumentation equipment, prior to, and/or after installation.
    2. Field Monitoring
        a. The engineer will approve the method of installation and maintenance of monitoring devices in accordance with these specifications.
        b. Perform all measurements and readings of the monitoring devices.

c. Notify the engineer of monitoring devices which become damaged or inoperable immediately.

3. Factory Calibration
   a. Conduct a factory calibration on all instruments at the manufacturer's facility prior to shipment. Each factory calibration shall include a calibration curve with data points clearly indicated, and a tabulation of the data. Mark each instrument with a unique identification number.
   b. Make factory calibrations of piezometers against a pressure gage traceable to the National Institute of Standards and Technology. The accuracy of the pressure gage shall not be less than twice the specified accuracy of the piezometers. Make full scale calibrations in two complete cycles, recording the reading in 10 equal increments during two loading and two unloading cycles.
4. Field Calibration
   a. Upon receipt of the instruments at the project site check all instruments and perform field calibrations to ensure that they are functioning properly in accordance with manufacturer instructions.

**Materials.**

A. Materials for the installation of the instrumentation shall be in accordance with the following:
   1. Vibrating Wire Piezometers -
      a. Provide vibrating wire transducer type piezometers capable of measuring pore water pressures up to 100 psi. The piezometers shall be Model 4500 produced by Geokon, Inc., West Lebanon, New Hampshire; Model VW2100 produced by RST Instruments Ltd, Coquitlam, B.C., Canada; or an approved equal. Supply piezometers with thermistors built into the transducers to measure the temperature at the transducer location. Use a readout box to obtain pore pressure readings as required. This readout box shall be a Model GK-401 produced by Geokon, Inc., West Lebanon, New Hampshire; Model VW2104; produced by RST Instruments Ltd, Coquitlam, B.C., Canada; or an approved equal.
      b. Vibrating wire transducers shall have factory-attached cables of sufficient length to route to the terminal box without splicing. Provide cable of the same commercial source as the piezometers, and provide 4-conductor, 22-gauge, with 2 shielded twisted pairs, and a common shield wire. Attach cable to the piezometers through an integral bulkhead seal, consisting of an interior water stop seal and cable entry seal. Transducers must be water-tight over the specified pressure range of the transducer.
      c. Provide Geokon GeoNet Nodes Model 8800 series, sensemetrics Strand VW4, or an approved equal as needed based on instrument location and planned data logging locations.
      d. Install surge protection circuit boards on every lead wire connected into the terminal box to protect the vibrating wire piezometers. Provide surge protection circuit boards containing a combination of gas tube discharge rectifiers, solid state diode circuits, and coils to suppress electrical transients.

e. Grounding rods: Install 3/4-inch diameter by 10-feet long, copper clad steel as manufactured by Copperweld; Blackburn; or approved substitute at each logger location.

f. Ground cable: Install ASTM B8 copper, No. 4 AWG bare wire to ground each logger.

g. Cable identifications tags: Affix a label containing the serial number of the instrument near the end of each cable.

h. Where traffic is likely to run over the casing, install the piezometers with steel casing over the cable. PVC casing may be used elsewhere.

2. Inclinometer

   a. Inclinometers are subsurface displacement monitoring devices consisting of a grooved casing to be read with a manual probe or by placement of a shape accelerometer.

   b. Provide 2.75-inch diameter DGSI QC casing, Geokon Glue-Snap ABS Casing Model 6400, or an approved equal with end caps and other accessories as needed.

   c. Provide a GK-604 D Inclinometer system as manufactured by Geokon, a Digitilt AT System as manufactured by DGSI, or an approved equal. Provide a cable of sufficient length to take readings at the bottom depths of all inclinometer casings.

3. Multipoint Borehole Extensometer (MPBX)

   a. Multipoint borehole extensometers are sub-surface settlement/heave monitoring devices consisting of anchor points at depths as indicated on drawings connected to steel rods that are read by an automated head unit.

   b. MPBX shall be Geokon Model 1100, Geosense GEO-XB2, or approved equal with Geokon Model 4450 Vibrating wire transducers or approved equal.

   c. MPBX shall be connected to an automated data logger capable of transmitting data to the cloud-based monitoring platform.

4. Settlement Plate

   a. Settlement plates are sub-surface displacement reference platforms placed on the prepared ground surface prior to embankment fill placement. Risers are extended from the settlement plate as the fill is placed. A casing is placed around the riser for protection. Settlement plates are monitored by optical survey methods to determine vertical displacements occurring during and after embankment construction.

   b. Settlement Plates shall be Geokon Model 4625 approved equal. The riser pipe and outer casing shall be steel pipe conforming to the requirements of ASTM A53, Grade B, standard weight. The casing and the risers shall be as shown on the plan. The casing pipe shall have a minimum wall thickness of 0.375-inches. The riser pipe shall be SCH40 galvanized steel. Couplings, pipe caps, etc. shall conform to the requirements of ASTM A865. Threaded pipes shall be used for riser and casing pipe extensions.

   c. Sand shall conform to the requirements of ASTM C33.

5. Settlement Monuments
    a. Settlement monuments shall be three-dimensional fixable survey prisms suitable for installation in horizontal and vertical surfaces and capable of capturing settlement movement to an accuracy of 1/8-inch.
    b. Provide a stainless-steel bolt Monitoring Mini Prism (Leica GMP104) and an adhesive-backed squared reflective tape targets, (Leica GZM 29/30/31) or acceptable equivalent.
    c. Structure monitoring points shall have an identification tag with a punched number for identification.

    v

6. Telemetry System:
    a. The telemetry system shall be capable of providing a secure data connection to the cloud for data visualization services.
    b. Provide Geokon GeoNet Node Series 8800 or sensemetrics Strand to log and transmit vibrating wire data. Alternately, wire vibrating wire devices to centralized locations to be multiplexed using a Geokon LC2 or Campbell AVW200 with 16/32 MUX box with direct connection to the cloud telemetry device.
    c. Provide sensemetrics Thread Model X3 or approved equal to coordinate the vibrating wire loggers and to provide datalogging and transmission for digital instruments such as shape arrays. Provide sensemetrics Connect cables or other digital cables as needed to connect each instrument to the telemetry system.
    d. The telemetry system shall be powered by a suitable solar panel mounted at its location.
    e. Provide all necessary hardware to firmly connect the data logger and solar panel to the galvanized steel poles, in accordance with manufacturer recommendations.
    f. Provide PVC conduit as needed to protect cabling from sensors to data logger locations. Horizontal conduit runs shall be buried in trenches to provide protection from construction equipment and vehicles. Buried conduit shall be Schedule 40 PVC, rated for 90-degrees C, complying with applicable NEMA and UL standards.
    g. Provide fittings for PVC conduit, including elbows, terminations, expansions, and fasteners. All PVC fittings shall be glued using PVC primer and cement.
7. Grout for Extensometers and Inclinometers
    a. Provide cement-bentonite grout for backfilling instrumentation borings as recommended by instrument manufacturer. Bentonite shall be mixed with water before adding cement.
        i. Portland cement shall conform to the requirement of ASTM C150 for Type I or II cement.
        ii. Water shall be clean and free from injurious amounts of oil, acid, organic matter or other deleterious substance.

iii. Bentonite shall be premium-grade powdered natural Wyoming sodium-montmorillonite.

**Construction.**

A. Equipment

1. Provide all necessary plant, labor, material, and equipment, and perform all operations required for the installation of the instrumentation.
2. Protect and maintain instruments in working order for the duration of the contract.
3. If an instrument is damaged, moved, or disturbed due to causes other than settlement, repair, reset, or replace the damaged instrument within three days after being damaged. The engineer will be the sole judge of whether repair, resetting, or replacement is required. Do not place additional fills within 50-feet of a damaged instrument until the damage has been corrected to the satisfaction of the engineer. The engineer may impose a work stoppage in the vicinity of the damaged instrument until it is again operational.

B. Installation

1. Vibrating Wire Piezometers -
    a. Install the vibrating wire piezometers in boreholes at the locations and depths in accordance with the plans. Place vibrating wire piezometers within the compressible soil layer(s) to monitor pore pressures during and after construction of the embankments. Extend the piezometer's cable housing as the fill is placed or extend the cable outside the embankment area. Route cables around so that rigid inclusions are not crossed over.
    b. Drill boreholes either without drilling mud or with a material that degrades rapidly with time, such as Revert J. Extend the hole from 12 to 24-inches below the proposed piezometer location and wash it clean of drill cuttings. If applicable, saturate any porous elements, and fill the piezometer with water prior to installation. Have the diaphragm facing upwards prior to being lowered into position. While holding the instrument in position (a mark on the cable is helpful), take a field zero reading.
    c. Tremie grout the hole with special grout consisting of portland cement, bentonite and water. If the hole is greater than 50-feet deep, grouting shall be done in stages to prevent over-ranging the piezometer due to head of grout during installation. Provide a non-shrink and non-metallic special grout material that does not contain calcium chloride or other salts, aluminum, or other harmful metals. When tested in accordance with ASTM C827, the material shall show no shrinkage in the plastic state. When tested in accordance with ASTM C109, the material shall show a seven-day strength of not less than 3.5-pounds per square inch (psi) and a 28-day strength of between 5.0 and 7.0-psi as measured on 2-inch cubes. Use potable water in the special grout.

d. Route the cables for the vibrating wire piezometers up through the boreholes and place them in trenches leading to the readout boxes. These trenches shall be a minimum of one foot deep and one foot wide. Snake the cables in the trenches to include a minimum of 10-feet of additional cable length for every 100-feet of cable.
e. Allow grout to set for a minimum of 5-7 days prior to collection of baseline data.
f. Connect to telemetry system.

2. Inclinometer
   a. Install inclinometer casings in boreholes at the locations and depths as specified on the Drawings.
   b. The A-A orientation of the groves at the top of the casing shall be within 10-degrees of perpendicular to the face of MSE wall. The casing shall not deviate from vertical by more than 4-percent of the depth of that portion of the casing. Correct casing groove orientation shall be maintained throughout installation and the casing shall not be twisted upon completion of installation to align the grooves.
   c. Replace inclinometers that do not meet the specified requirements at no additional cost.
   d. A post-installation acceptance test will be performed to verify that no grout is in the inclinometer casing following installation, that the groove orientation and verticality are correct, and that the inclinometer probe tracks correctly in all 4 orientations. The casing groove spiral shall not exceed 1-degree per 10-feet of length after installation as verified with a spiral probe or an inclinometer probe with spiral readout capabilities.
   e. Provide surveyed elevation of top of inclinometer casing at time of baseline reading. Survey the inclinometer casing elevations weekly.
   f. Protect casing during fill placement. Extend casing as necessary during fill placement to maintain access to the inclinometer. Record surveyed top of casing elevation prior to adding an extension. Provide snap together casing extensions or sleeved casing extensions such that the groove alignment is maintained. Survey elevation of top of casing extension shall be provided at the time when the extension is added.
3. Multipoint Borehole Extensometer
   a. Install MPBX in boreholes at the locations and anchor depths in accordance with the plans.
   b. Anchor the head of the extensometer at the top of the borehole.
   c. Route cabling in trenches to data logger locations.
   d. Use a bentonite grout mix for backfilling per manufacturer's mix recommendations.
   e. Allow grout to cure for 3-5 days before setting instrument head.
   f. Connect to telemetry system.
   g. Extensometers abandoned at the completion of the project shall have their rods and casings cut off two feet below roadway subgrade level and backfilled with grout.

4. Settlement Platforms and Monuments
    a. Perform all readings on the settlement platforms and settlement monuments. Assume full responsibility for establishing benchmarks, submittals, and providing, installing, and maintaining the settlement platforms.
    b. Install the settlement monuments at locations in accordance with the plans or as directed by the engineer.
    c. Tamp the sand base to provide a firm, level, and unyielding bearing surface for the base plate. Mark the riser pipe in 1-foot increments and labeled at 5-foot increments to indicate the distances above the plate extending up through the embankment fill. Mark riser extensions in the same increments after the riser is joined at the threaded connection.
    d. The initial casing and riser pipes shall have a maximum length of 5-feet for each section. Provide spacers between the riser pipe and the casing at a minimum of 5-foot intervals to ensure concentricity. Do not directly attach the spacers to the riser pipe or otherwise install such that movement of the riser pipe would be impeded.
    e. As the height of fill above the settlement plate changes, increase or decrease the casing and riser pipes in a maximum of 5-foot intervals to maintain the top of the riser pipe and casing above the embankment. Record survey readings immediately before addition of a riser extension. As each additional length of pipe is added or removed, immediately transfer the pipe cap on the casing to the top section on the settlement plate so as to prevent fill material from entering the casing. At other times, only remove the cap to check settlement. Record survey reading immediately after addition of riser at the new top of riser.
    f. Indicate the casing pipe locations by flags, cones, bollards or other approved method to clearly show its location and to warn equipment operators and others of its location. Maintain the indicators during the entire length of the contract and replace indicators that are missing. At no time shall the settlement plate risers and casings extend higher than 6 feet above the ground surface elevation. Add or remove sections as necessary during embankment construction to maintain the tops of the risers and casings at least 0.5-foot above the ground surface.
    g. Settlement Plates which are to be abandoned at the completion of the project shall have their riser pipes cut off two feet below roadway subgrade level and capped.
    h. The use of the settlement platforms for collecting data related to embankment foundation response will extend beyond the time of completion of the embankment placement operations. Assure that all platforms are in working order until the time of completion of the monitoring period as described above.
    i. Read the instrumentation as indicated above.
    j. For vertical deformation monitoring, runs shall be performed by a single run beginning and ending on two different benchmarks installed in accordance with NGS standards. Use settlement

monitoring monuments or points as turning points or as intermediate foresights from two different turning points, allowing elevations to be adjusted and eliminating significant observational errors. The maximum length of line of sight shall be 150-feet, and the imbalance between backsight and foresight shall not exceed 30-feet. Allowable level loop misclosure shall not exceed ±0.033 times the square root of M feet (where M is the distance of the level run in miles) for a single run between two benchmarks. A formal initial reading on a settlement monitoring point will consist of the average of three elevations, from three independent level runs, which meet the closure specified herein. Determine elevations established subsequent to a formal initial reading by a single run as specified herein. The least count (without estimation) of the rod and level combination shall read to 0.003-foot or less, such that the accuracy of an elevation measurement shall be ±0.01-foot (at 95-percent level of confidence).

k. Record in U.S. survey feet.

l. Instruments used for vertical deformation monitoring shall have a minimum accuracy of plus or minus 0.005-foot (standard deviation for 3300-feet of double run leveling) and a minimum setting accuracy of plus or minus 1.0-arc-seconds. Leveling rods shall be non-telescopic in design (i.e., "Chicago" style leveling rod). Use a bull's eye bubble to plumb the leveling rod. Fiberglass rods will need approval of the engineer prior to use.

**Method of Measurement:**

A. The Department will measure inclinometers, piezometers, settlement platforms, and multipoint borehole extensometers per each installed, monitored and accepted.

B. No measurement will be made for extension of instruments due to placement of fill.

C. The telemetry system will not be measured.

**Basis of Payment:**

A. The Department will pay for instruments at the contract unit price per each complete in place. Price and payment will constitute full compensation for:

1. Providing all instruments and materials;
2. drilling of holes;
3. casing;
4. conduits;
5. pipe;
6. sand;
7. terminal boxes and covers;
8. telemetry;
9. reporting;
10. installation;

11. measurement;
12. maintenance of the instruments;
13. abandonment of instruments no longer required;
14. repair or replacement of faulty equipment; and
15. incidentals necessary to complete the Work.

B. The Department will not pay for any instruments replaced or repaired due to damages or inoperative due to operations or operations of the subcontractor.

2/28/23

## 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 link for the posting is https://deldot.gov/Business/bids/index.shtml?dc=asphalt_cement_english.

The Project Asphalt Cement Base Price will be the Delaware Posted Asphalt Cement Price in effect on the date of advertisement.

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.

If the Contractor exceeds the authorized allotted completion time, the price of asphalt cement on the last authorized allotted workday, 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.

12/14/2020

# 401510 – TACK COAT

**Description:**

The Department will not measure and will make no payment for this item. This language replaces Section 1011 of the Standard Specifications.

## SECTION 1011 -TACK COAT

### 1011.1 Description.

Provide material in accordance with 1011.2 for thin lift maintenance applications, or as directed by the engineer. Provide material in accordance with Section 1011.3 and selected from the approved product list and in accordance with manufacturer recommendations for all other applications.

### 1011.2 Asphalt Cement (PG Graded).

Provide PG-64-22 (PG 64S-22) as tack coat in lieu of emulsified asphalts.

### 1011.3 Emulsified Asphalts.

1. Anionic emulsified asphalt in accordance with M140 except the sieve test requirement for field samples collected at the point of use shall be a maximum of 0.4 percent.
2. Cationic emulsified asphalt in accordance with M208 except the sieve test requirement for field samples collected at the point of use shall be a maximum of 0.4 percent.
3. Polymer-modified cationic emulsified asphalts in accordance with M316 except the sieve test requirement for field samples collected at the point of use shall be a maximum of 0.4 percent.
4. Non-Tracking emulsified asphalt in conformance with Table 1011.3-1.

**Table 1011.3-1 Non-Tracking Emulsified Asphalt Requirements.**

| Property | Test Method | Requirement |
|---|---|---|
| Saybolt Viscosity at 77 F, (SFS) | AASHTO T59 | 15-100 |
| Storage Stability Test, 24 hours, (%) | AASHTO T59 | 1 maximum |
| Residue by Distillation or Residue by Evaportation, (%) | AASHTO T59 | 50 minimum |
| Sieve Test, No. 20, (%) | AASHTO T59 | 0.4 maximum for field samples |
| Penetration at 77 F, 100 g, 5 s, (dmm) | AASHTO T49 | 10-40 |
| Solubility in Trichloroethylene, (%) | AASHTO T44 | 97.5 minimum |

6/11/2024

## 401580 - RIDE QUALITY OF BITUMINOUS PAVEMENT

### Description:

This specification outlines requirements for an acceptable ride surface in addition to requirements established in DelDOT 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.

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.

**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.

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

Where: L = Length Segment (ft.)

W = Lane Width (ft.)

T = Plan Thickness (in.)

*IRI Incentive / Disincentive = 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:

*(∑ IRI adj for each section) - 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 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 DelDOT 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 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 2000$^{th}$ 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 sublot basis. The size for each sublot shall be 100 to 500 tons and testing for the sub lots will be completed on a daily basis. For each sublot, 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

- 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 with 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.

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 140ÇF 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. 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.**

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 target) + (single test tolerance) - (mean value)) / (standard deviation).
3. For each parameter, calculate the Lower Quality Index (QL):

   QL = ((mean value) - (JMF target) + (single test tolerance)) / (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.
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, 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 |
| 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 |
| 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 | | | | | | | |
|---|---|---|---|---|---|---|---|
| PU or PL | QU and QL for An@ Samples | | | | | | |
| | 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 |
| 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 sublot tests values, to the nearest 0.001 unit. Obtain the Theoretical maximum Specific Gravity values from the corresponding laboratory sublot tests.
2. Calculate the Degree of Compaction:

   Degree of Compaction =

   ((Core Bulk Specific Gravity) / (Theoretical Maximum Specific Gravity)) x 100% recorded to the nearest 0.1%.
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:

   Construction Pay adjustment = (Lot Quantity) x (Bid Price) x (Pay Adjustment Factor) x 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

| **Table 5A: Compaction Price Adjustment Other[1] 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.

**.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 Contractors request where the results substantiate the acceptance test result will be assessed a fee of $125. Any additional Dispute Resolution samples that substantiate the Contractors 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 - DelDOT 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:

- 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.

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.

Newly placed materials use a different set of structural coefficients. They are as follows:

| New Material | Structural Coefficient |
|---|---|
| HMA | 0.40 |
| Asphalt Treated Base (BCBC) | 0.32 |
| Soil Cement | 0.20 |
| GABC | 0.14 |

**Example:**

Location includes placement of a 1.25" Type C overlay on 2.25" Type B. Existing roadway is cored and is shown to consist of 2" HMA on 7" GABC.

Calculation:

For the Type B lift the calculation would be:

| | | | |
|---|---|---|---|
| Existing HMA | 2 * 0.32 | = | 0.64 |
| GABC | 7 * 0.14 | = | 0.98 |
| | | | **1.62** |

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 |
| | | | **2.52** |

11/3/20

# 602505 - PERSONNEL SAFETY GRATE

## DESCRIPTION:

This work consists of providing all materials, fabricating, delivering and constructing personnel safety grates for pipe inlets.

## MATERIALS:

| | |
|---|---|
| A. Grout | Section 1047 |
| B. Welding | AASHTO / AWS D1.1 Welding Code |
| C. Castings | Section 1039.7 |
| D. Hardware and fasteners | Section 1039.10 |

## CONSTRUCTION METHODS:

A. Prepare and submit working drawing in accordance with section 105.4.

B. Construct personnel safety grates for pipe inlets in accordance with the Standard Construction Details and as shown on the plans.

## METHOD OF MEASUREMENT:

The Department will measure as each the number of personnel safety grates installed and accepted.

## BASIS OF PAYMENT:

A. The Department will pay for personnel safety grates at the contract unit price per each placed and accepted. Price and payment will constitute full compensation for:

1. preparing submittals and working drawings;
2. providing and placing all materials;
3. fabricating;
4. disposal;
5. pad lock;
6. bar reinforcement;
7. coating; and
8. all labor, equipment, and other incidentals.

3/6/2023

# 705509 - PATTERNED PORTLAND CEMENT CONCRETE SIDEWALK, 4"

# 705519 - PATTERNED PORTLAND CEMENT CONCRETE SIDEWALK, 6"

# 705521 - PATTERNED PORTLAND CEMENT CONCRETE SIDEWALK, 8"

## Description:

This work consists of constructing patterned PCC sidewalk.

## Materials:

| | | |
|---|---|---|
| A. | PCC, Class B | Section 1022 |
| B. | 1/2-Inch Preformed Expansion Material | Section 1042 |
| C. | Joint or Crack Sealant Material | Section 1045 |
| D. | Internally Incorporated Concrete Pigment Admixture | ASTM C979 |

E. Release Agent
   1. Provide a clear release agent formulated to prevent bonding of texturing tools to the concrete surface and that is compatible with the sealant manufacturer recommendations.

F. Topically Applied Non-Film Forming, Amorphous Colloidal Silica Based Finishing Aid
   1. SkaCem-190, or equal.

G. Silane-Based Concrete Sealer — Section 1045.3

## Construction:

A. Contractor Requirements and Submissions
   1. Submit patterned concrete contractor qualifications verifying successful completion of at least 3 separate patterned concrete projects within the last 5 years to the engineer for approval.
   2. Provide a minimum 3-foot x 3-foot sample size of each pattern and color of patterned concrete proposed for use to the engineer for approval.
   3. Any necessary field changes to the color will be directed by the engineer.

B. Incorporate concrete pigment admixture directly into the concrete.

C. Construct concrete in accordance with section 705.3.

D. Apply non-film forming, amorphous colloidal silica-based finishing aid in accordance with manufacturers recommendations.

E. Spray release agent onto the patterning tool. Reapply release agent as needed during patterning.

F. While concrete is still in plastic stage of set, imprint the engineer approved pattern and texture.

G. Cure concrete in accordance with section 501.3.6.B.

H. Prepare patterned PCC surface for silane-based concrete sealer application in accordance with section 613.3.B.

I. Apply silane-based concrete sealer to patterned PCC surface in accordance with section 613.3.D.

**Method of Measurement:**

The Department will measure patterned sidewalk quantity as square feet of patterned sidewalk completed and accepted.

**Basis of Payment:**

A. The Department will pay the quantity of patterned sidewalk at the contract unit price per square feet. Price and payment constitute full compensation for:
    1. Excavation within the template of the item including the foundation;
    2. removal and disposal of existing materials;
    3. foundation preparation;
    4. providing and placing all materials;
    5. compaction;
    6. forms and forming;
    7. supplying, coloring, placing, finishing, patterning, sealing, and curing PCC;
    8. joints;
    9. expansion joint material;
    10. surface preparation ahead of sealing;
    11. sealing;
    12. backfill and backfilling;
    13. removing surplus materials; and
    14. removing and replacing cracked or damaged sidewalk as directed by the engineer.

B. The Department will pay for:
    1. Excavation and embankment outside the template of the item in accordance with Section 202 at the direction of the engineer or in accordance with the contract;
    2. rock removal in accordance with Section 202;
    3. undercut excavation in accordance with Section 202;
    4. PCC removal in accordance with Section 211;
    5. saw cutting in accordance with Section 762;
    6. GABC in accordance with Section 301; and
    7. bituminous pavement patching in accordance with Section 401 in addition to the curb item.

C. The Department will not pay for any modifications due to color selection during the sample approval process.

1/29/24

## 707500 - CHANNEL BED FILL

### Description.

This work consists of providing and placing channel bed fill.

### Materials.

A. Provide aggregate material meeting the following requirements:

1. Natural, rounded, unwashed and uncrushed aggregate material meeting the gradation of Table 1 when tested in accordance with AASHTO T-11 and T-27.
    a. Aggregate material meeting this requirement may be located within the excavation area of the project. This material may be salvaged by separating and stockpiling the material meeting the requirements of Table 1 and Notes 1&2.
    b. Angular quarried aggregate is unacceptable.

**Table 1**

| Percent Passing | Light [3] | Medium [4] | Heavy |
|---|---|---|---|
| 5-inch | 100 | 90-100 [1] | Gradation to be noted on Plan sheets |
| 1-inch | 70-100 [1] | 0-20 [2] | |
| 3/4-inch | 30-95 | | |
| 3/8-inch | 0-10 [2] | | |

**Notes:**

[1] Salvaged materials may contain material exceeding this size and be acceptable.

[2] Salvaged materials may contain up to 20% passing the 3/8-inch sieve but not to exceed 10% passing the #200 sieve when tested in accordance with AASHTO T-11.

[3] Unless noted otherwise on plan sheets, light gradation shall be used in locations in Sussex County

[4] Unless noted otherwise on plan sheets, medium gradation shall be used in locations in Kent and New Castle Counties.

### Construction.

Place channel bed fill to the dimensions and at the locations shown on the plans or as established by the engineer.

### Method of Measurement.

The Department will measure the quantity channel bed fill as the number of cubic yards of material placed and accepted.

**Basis of Payment.**

A. The Department will pay for channel bed fill at the contract unit price per cubic yard. Price and payment will constitute full compensation for:

1. Providing all materials;
2. salvaging and stockpiling;
3. hauling;
4. removal and disposal; and
5. all incidentals required to complete the Work.

B. The Department will pay for excavation in accordance with section 203.

1/20/22

# 710601 – INSTALLATION OF WATER MAINS AND ACCESSORIES, TW

## Description:

This work consists of providing and installing all materials to relocate the water main and accessories.

Any requirements included in the Technical Specifications that are not addressed on the plans or by these Special Provisions shall be performed in accordance with the applicable sections of Appendix B Technical Specifications. The Contractor is advised to obtain and be fully acquainted with the applicable specifications of the Owner. Costs to comply are considered incidental to Item 710601.

The Owner of the water line on this portion of the project is Tidewater Utilities, Inc. and their Technical Specifications for Waterline (TW) Work are included in this contract as Appendix B to the Special Provisions. When referenced in these Special Provisions, or the Technical Specifications, the Owner is intended to be represented by an employee of Tidewater Utilities, Inc.

"Breakout Sheets" are included in the contract to establish unit prices for the items listed in the specific Breakout Sheet. The total of these unit prices multiplied by the estimated quantities, as totaled for all Breakout Sheets, will establish the total Lump Sum price to be submitted with the bid. Each listed item will be measured in the field as a unit price item. The final Lump Sum payment for Item 710601 will be adjusted by change order, either plus or minus, to match the final totals of all unit price items established in the Breakout Sheets. Failure to complete and submit the Breakout Sheets with the bid will cause the bidder to be considered unresponsive.

## Special Requirements

A. As listed in the Appendix B Technical Specifications 01000, 01300, 01400, 01600, 02221, 02222, 02660, 02661, 02662, 02663, 02666 and Contractor Requirements for Water Relocation Work.

B. An inspector representing the Owner must be present during any service connections. A Licensed Plumber must perform all service connections from the meter to the customer's service line.

C. All work on this item shall be performed by a contractor prequalified and acceptable to Tidewater Utilities, Inc. A list of contractors currently pre-qualified by Tidewater Utilities is included in Appendix B, along with a process to request pre-qualification of other firms.

## Materials

A. Provide materials in accordance with the Plans and Owner specifications.

B. PCC, Class B — DelDOT Section 1022

C. Borrow, Type B and C — DelDOT Sections 209 and 1001

## Construction

A. Submittals
   1. In addition to the as-built drawings outlined in Technical Specifications Section 01300, submit sources of supply and catalog cuts to DelDOT for all materials provided as part of Item 710601 as required by Standard Specification Section 106.
   2. Submit for review and approval by the Engineer a detailed plan for dewatering the work zone prior to beginning any water relocation work. It is intended to place all pipe and appurtenances in a "dry trench". Refer to Technical Specifications for additional bedding details.
   3. Submit the proposed materials, procedure, and sequence of operations for review and approval by the Engineer and Owner before beginning work on any "wet taps".
   4. Submit to the Owner and the engineer, material certifications identifying AIS/BABA compliance, and BABA Certification letter

B. In cases of conflict between the contract and the utility owner’s specifications, the priority order is as follows with number 1 having the highest priority:
   1. Contract Plans
   2. Tidewater Specifications (Appendix B)
   3. This Special Provision
   4. DelDOT Standard Specifications

C. Construct in accordance with the Technical Specifications and the Plans.

D. Fill all abandoned pipes to be abandoned in place with flowable fill as directed by the engineer.

## Method of Measurement

A. The Department will not measure this item.

B. The Department will measure the items identified as linear foot in the Breakout sheets as the total length of the item end to end, of the final length installed and accepted. The Department will not measure the quantity of fittings, bends, tees, or reducers.

C. The Department will measure the items identified as each in the Breakout sheets as the quantity of items installed and accepted.

## Basis of Payment

A. The Department will pay for installation of watermains and accessories at the contract lump sum price. Price and payment will constitute full payment for:
   1. Providing and placing all materials;
   2. Adjusting, relocating, or repairing the services;
   3. Testing the water main system;
   4. Repairing leaks and defects;
   5. Connecting to existing water main systems and services;
   6. Maintaining service during the work;
   7. Excavating;
   8. Disposing of excess excavated material;
   9. Backfilling and backfill material;
   10. Concrete thrust blocks and other Owner requirements;
   11. Necessary fittings including but not limited to tees, bends, reducers, caps, restraints;
   12. Pipe bedding;
   13. Providing, placing, and removing shoring;
   14. Temporary support of existing utilities;
   15. Dewatering;
   16. Salvaging, abandoning, or removing existing pipes;
   17. Cutting and capping new or existing lines; and
   18. As-built preparation and collection.

B. B. The Department will make no separate payment for temporary bypasses. Emergency repairs are the contractor's responsibility. Upon notification by telecommunication from the utility owner, attend to repairs immediately. In the event the utility owner is unable to contact the contractor, or the contractor fails to make the emergency repairs in a length of time determined by the utility owner, the utility owner reserves the right to perform the emergency repair work. In such a case, reimburse the utility owner for the costs of the repairs.

C. The breakout sheet price for each item shall include providing and installing all materials to resolve any alignment conflict between a water main and storm sewer or other Utility pipe.

D. The Department will pay for any excavation and backfill below the originally designed elevations due to unsuitable material in accordance with Section 202.

E. The Department will pay for the following items at their applicable unit bid prices if required due to field conditions:
   1. Pavement Sawcutting,
   2. Roadway Patching materials (GABC and warm mix) above the Borrow, Type C backfill,
   3. Removal of existing concrete,
   4. Topsoil,
   5. Seeding,

6. 57 stone bedding,
7. All Maintenance of Traffic items
8. Flowable Fill

F. For Service Connections, the breakout sheet price per each shall also include all materials for the installation of necessary service lateral pipe, labor and equipment necessary to adjust an existing service connection and/or meter box. Also included in the breakout sheet price per each is the cost to have any service connections performed by a Licensed Plumber.

G. A percentage of the total Lump Sum bid price will be paid based on the work performed in each pay period. The percentage will be calculated by multiplying the total units of each completed Breakout Item times the appropriate unit price; then adding the total dollars of completed work, divided by the total Lump Sum bid price for item 710601, Water Main and Accessories. Final payment may result in less than 100% of the total Lump Sum based on actual work performed. Should the Lump Sum total be exceeded, a Change Order will add additional funds based on the best available estimate. Failure to fully complete the Breakout Sheets for this Item will result in the bid being declared non-responsive.

H. All emergency repairs required during this Contract period shall be the Contractor's responsibility. However, in the event the Owner or Engineer is unable to contact the Contractor for the immediate emergency repair items of work, or in the event the Contractor does not take action when contacted within one hour, the Owner of the utility reserves the right to attend to any and all emergency repair work items and to resubmit the costs directly to the Contractor for complete payment.

I. Breakout Items

| **Breakout Item** | **Description** |
|---|---|
| **TU-1** | Waterline STA 1000+00 to STA 1004+71.51 [Lump Sum]<br>Waterline STA 1100+00 to STA 1101+95.02 [Lump Sum] |
| **TU-2** | Waterline STA 1004+71.51 to STA 1005+62.49 [Lump Sum] |
| **TU-3** | Additional Items: Fire Hydrants Tied Into Existing 8” Main [Lump Sum] |

11/17/25

## 763501 - CONSTRUCTION ENGINEERING

## 763597 – UTILITY CONSTRUCTION ENGINEERING

### DESCRIPTION:

A. This work consists of construction lay out. Subsection 105.10 Construction Stakes, Lines and Grades will be replaced by this spec.

B. The Department will only establish the following:
   1. Original and final cross-sections for borrow pits.
   2. Final cross-sections:
      a. Top and bottom pay limit elevations for all excavation bid items that are not field measured by construction inspection personnel.
      b. 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.
   3. Line and grade for extra work added on to the project plans.

C. When applicable, this work will also consist of providing construction and right-of-way/easement information to utility companies performing work (as defined in the Utility Statement) within the LOC.

### MATERIALS:

Not applicable.

### CONSTRUCTION METHODS:

A. Equipment
   1. Use and 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. Renew the certification a minimum of every 9 months. The equipment/instrument shall have a minimum measuring accuracy of [3mm+2ppmxD] and an angle accuracy of up to 2.0 arc seconds or 0.6 milligons.
   2. If the use of GPS technology in construction stakeout is chosen, provide the engineer with a GPS rover and automatic level for the duration of the contract. The GPS rover must be in good working condition and of similar make and model. Provide formal training on the GPS system being used to a maximum of 4, of the engineer’s appointees. The formal training must be up to 8 hours or to the satisfaction of the engineer. At the end of the contract, the engineer will return the GPS rover. If any of the equipment/instruments are found to be out of adjustment or inadequate to perform its function they shall be immediately replaced to the satisfaction of the engineer.

3. Choosing to use GPS technology does not give the authority to use machine control. Construction Engineering (GPS) Machine Control Grading shall only be used if noted in the contract outlining the available files that will be provided 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 contract shall be provided. If 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.

B. Engineering/Survey Staff

1. Provide and have available an adequate engineering staff that is competent and experienced to set lines, grades, and compatibility with the scope of the project. Additionally, 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 subcontracting requirements of Subsection 108.1. Assume full responsibility for any errors and/or omissions in the work of the engineering staff.

C. Performance Requirements

1. Construction Engineering shall include establishing:
   a. the survey points and survey centerlines;
   b. finding, referencing, offsetting the project control points;
   c. running a horizontal and vertical circuit to verify the precision of given control points.
2. Establishing plan coordinates and elevation marks for:
   a. culverts
   b. slopes
   c. subbase
   d. subsurface drains
   e. paving
   f. subgrade
   g. retaining walls
   h. any other stakes required for control lines and grades.
3. Setting vertical control elevations for:
   a. footings
   b. caps
   c. bridge seats and deck screed.
4. Preserve the Department's project control points and benchmarks. 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. Replace any or all stakes that are destroyed at any time during the life of the contract as directed by the engineer. 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 feet times. The horizontal control precision ratio shall have a minimum precision of 1:20,000 feet of distance traversed prior to adjustment.

5. Perform construction centerline layout of all roadways, ramps, connections, and driveways from project control points set by the engineer. Use the profiles and typical sections provided in the plans shall calculate proposed grades at the edge of pavement or verify information shown on the Grades and Geometric sheets.
6. Advise the engineer of any horizontal or vertical alignment revisions needed to establish smooth transitions to existing facilities. 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.
7. Establish the working points at 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 in accordance with the contract. Before completion of the fabrication of beams for bridge superstructures, verify the locations, both vertically and horizontally, of all bearings and 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, survey top of beam elevations at a maximum of 10-foot stations and compute screed grades. Submit the beam elevations 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 intervals as established by the engineer to assure that all components of the structure are constructed in accordance with the lines and grades shown on the plans. Take full responsibility for all structure alignment control, grade control and all necessary calculations to establish and set these controls.
8. Investigate proposed construction for possible conflicts with existing and proposed utilities. Report any conflicts to the engineer for resolution.
9. Stake all sidewalk and curb ramp grades in accordance with the contract. Review the stakeout with the engineer prior to construction. The engineer must approve any deviation from the contract in writing.
10. Stake all drainage inlets in accordance with the contract. The offsets and top of grate elevations need to be calculated for each type of drainage inlet specified in the contract in order to line up the drainage inlet's flow line with the specified curb or ditch flow line as shown in the contract. The engineer must approve any deviations from the contract in writing.
11. If wetland areas are involved and specifically defined on the plans the following shall apply:
    a. Do not enter, damage, or destroy wetland areas, which exist beyond the LOC. These provisions will be strictly enforced, and all personnel shall understand the importance of these provisions.
    b. Delineate wetlands at the LOC throughout the entire project, before any clearing operations commence as shown on the plans to the satisfaction of the engineer.

c. Use orange vinyl flagging material with "Wetland Boundary" printed on the flagging. In wooded areas, tie the flagging on the trees, at approximate 20-foot intervals through wetland areas. In open field and yard areas that have been identified as wetlands, drive 6-foot posts into the ground at approximate 50-foot intervals and tie with the flagging. The flagging shall extend approximately 12-inches in length beyond the post. Use oak posts with cross sectional dimensions of 1 1/2-inches to 2-inches by 1 1/2-inches to 2-inches or 1/4-inch rebar.

d. If the flagging has been destroyed and the engineer determines that its use is still required, reflag the area. Flagging shall be replaced within 48 hours of notification that replacement is needed. After 48 hours the engineer may proceed to have the area reflagged.

e. Remove all posts and flagging at project acceptance.

f. Assume any responsibility for any damages to wetlands located beyond the LOC, which occurs from his/her operations during the life of the contract. Restore all temporarily disturbed wetland areas to their preconstruction conditions.

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

D. Submittals

1. All computations, survey notes, electronic files, and other records necessary to accomplish the work shall be preserved and 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 and any necessary correction to the work shall be made as soon as possible. Provide the engineer with such assistance as may be required for checking all lines, grades, and measurements necessary for the execution of the work. Checking by the engineer shall not relieve responsibility for the accuracy or completeness of the work. Copies of all notes must be provided to the engineer at the completion of the project.

2. 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.

E. Machine Control Grading

1. Machine control grading to be used on the project if authorized by the engineer.
2. 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.
3. Materials:
   a. Provide all equipment required to perform GPS machine control grading, including equipment needed by to verify the work to the engineer.
   b. Use manufacturer's GPS machine control equipment and system to achieve the grading requirements in accordance with the contract.
4. Construction
   a. Convert the electronic data provided by the Department into the format required for the equipment.
   b. The Department will provide no additional electronic data.
   c. Perform at least one 500 foot test section with the selected GPS system to demonstrate 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. Failure to demonstrate this ability to the satisfaction of the engineer, construct the project using conventional surveying and staking methods.
   d. DelDOT Responsibilities:
      i. The Department will set initial vertical and horizontal control points in the field for the project as indicated in the contract.
      ii. The Department will provide the project specific localized coordinate system.
      iii. The Department may provide data in an electronic format as indicated in the general notes.
         (1.) The information provided shall not be considered a representation of actual conditions to be encountered during construction. Providing this information does not relieve the responsibility of making an investigation of conditions to be encountered. This includes site visits, and basing the bid on information obtained from these investigations, and the professional interpretations

and judgments of the contractor.

(2.) The Department will develop and provide electronic data for use as part of the contract in the format as indicated in the general notes.

iv. The Department will provide the following electronic files:

(1.) ASCII data files with coordinates and elevations for proposed points as selected by the engineer.

(2.) Existing digital terrain model in .dtm file format compatible with software currently used by the Department.

(3.) Proposed digital terrain model in .dtm file format compatible with software currently used by the Department.

(4.) Design file in .dgn file format, that contains 3D features lines for the proposed design, 3D feature lines are for the proposed top surface elevation only.

v. The engineer will perform spot checks of the machine control grading results, surveying calculations, records, field procedures, and actual staking. If the work is not being performed in a manner that will assure accurate results, the engineer may order the work to be redone to the requirements of the contract. The engineer may also require the use of conventional surveying and staking.

e. Contractor's responsibilities:

i. No less than 2 weeks before the scheduled preconstruction meeting, 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.

ii. If the need to establish new control points, traverse from existing control points and verify to be accurate by conventional surveying techniques.

iii. Assume all risks and liabilities of any assumptions or manipulations marked from the electronic information provided or if chosen to develop a separate digital terrain model.

iv. Ensure that the electronic data provided will function in their machine control grading system.

v. 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. Provide a total of 8 hours of formal training on the GPS machine control system to the engineer and up to three additional Department appointees per rover.

vi. Review and apply the data provided by the Department to perform GPS machine control grading.

vii. Convert the electronic data provided by the Department into a format compatible with their system.

viii. At the beginning of each work day check and if necessary, recalibrate the GPS machine control system in accordance with the manufacturer's recommendations, or more frequently as needed to meet the requirements of the project.

ix. Meet the accuracy requirements as detailed per the Department's standards.

x. 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 not to exceed 1000 feet intervals. 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. Assume responsibility for all errors resulting from these efforts and correct deficiencies to the satisfaction of the engineer.

xi. Provide stakes at all alignment control points, at every 500 foot stationing, and where required for coordination activities involving environmental agencies and utility companies.

xii. Set hubs, at a minimum of 500 foot intervals, at the top of finished grade at all hinge points on the cross section 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, and wetland mitigation sites. These control points shall be established using conventional survey methods for use by the engineer to check the accuracy of the construction.

xiii. Preserve all reference points and monuments that are identified and established by the engineer for the project.

xiv. Provide control points and conventional grades stakes at critical points such as, PC's, PT's, superelevation points, and other critical points required for the construction of drainage and roadway structures.

xv. 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.

xvi. 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 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. Operate and maintain all elements of the Machine Grade Control continuously once the operations begin until otherwise approved by the engineer.

5. Contract Control Plan:
    a. Develop and submit a Contract Control Plan for use of Machine Control Grading. Contract control includes all primary and secondary horizontal and vertical control which will be used for the construction contract. Upon the completion of the initial survey reconnaissance and control verification, but prior to beginning primary field operations, submit a Contract Control Plan document. The Contract Control plan shall be signed and sealed by a Delaware licensed Land Surveyor or Delaware Professional Engineer who oversees its preparation for acceptance by the engineer. The plan shall include the following:
        i. A control network diagram of all existing horizontal and vertical control recovered in the field as contract control.
        ii. 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.
        iii. 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.
        iv. 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.
        v. 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.
        vi. 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.
        vii. If chosen 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 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.

F. Utility construction methods:
    1. The engineer must approve all requests for Utility Construction Engineering before the work begins.
    2. Instruct utility companies to submit their requests to the engineer. The engineer will decide if the requested work meets the criteria for Utility Construction Engineering or is normal Construction Engineering and

pass the requests along with the decision.

3. The survey crew size shall be adequate to efficiently perform the work required and must be approved by the engineer.
4. Work covered under Utility Construction Engineering will fall into two categories:
   a. Engineering/surveying work that is not necessary for construction of the project, staking the clear zone line, providing cut/fill grades at proposed utility pole locations, staking back of drainage structures, and staking right-of-way lines where construction of the project (exclusive of utilities) is within the right-of-way.
   b. Engineering/surveying work that is necessary for construction but must be provided for utility companies well in advance of the need and will likely need to be redone later, as determined by the engineer. This can be any of the Construction Engineering work that when done early cannot be expected to remain undisturbed until needed for construction of the project (non-utility).

**METHOD OF MEASUREMENT:**

A. The Department will not measure construction engineering.
B. The Department will measure the quantity of utility construction engineering as the actual number of hours the survey crew is in the field actively engaged in utility construction engineering work.

**BASIS OF PAYMENT:**

A. The Department will pay the lump sum unit bid price for this work. Price and payment constitute full compensation for:
   1. the work associated with construction engineering;
   2. providing all equipment and instruments;
   3. providing and placing stakes;
   4. flagging and any reflagging;
   5. reconstruction of work;
   6. all costs related to the development of separate digital terrain model;
   7. reestablishing reference points; and
   8. wetland restoration.
B. The Department will pay for utility construction engineering at the contract unit price per hour actively engaged in performing the work. Price and payment will constitute full compensation for:
   1. Office work;
   2. providing all labor;
   3. equipment;
   4. instruments;
   5. stakes; and
   6. other materials necessary to complete the work.

C. The Department will make monthly payment in proportion to the amount of work done as determined by the engineer.

D. The Department will not make any adjustment in payment for any issues with equipment to operate the GPS machine control system for any construction items or be justification for granting contract time extension.

E. The Department will not make any consideration 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.

F. The Department will not make any adjustments for all liability, costs, or delays if the contractor chooses to develop a separate digital terrain model.

4/20/21

# 763520 - ELECTRONIC TICKETING

## Description:

This work consists of providing electronic data for material weight tickets delivered to the project. This work also consists of placing an identifying vehicle number on the driver side and the passenger or rear sides of the delivery vehicle. This does not preclude or dismiss any requirement for paper tickets required by the Standard Specifications or other rules and regulations.

## General Requirements:

A. Send electronic tickets (eTicket) to the Department's Electronic Ticketing Portal https://tickets.deldot.gov as they are generated. The Department will reject any load that does not have a corresponding eTicket unless the cause is beyond the contractor's control. In such circumstances paper tickets may be permitted at the discretion of the engineer.

B. Payment for material weight delivered to the project will be based upon the eTickets marked *"Delivered",* less waste, excess material weight as noted in 105.12 of the Standard Specifications, and any audit corrections.

C. Do not reissue or reprint tickets that have been marked "*Delivered"* or *"Rejected"* without first notifying the engineer. The engineer may reject a reissued or reprinted ticket at their discretion. When a reissued or reprinted ticket is rejected, payment will be based upon the original ticket.

## Data Integration:

Request a list of the Department's naming nomenclature. Include in the request an identification of what system the supplier utilizes for its load read-out weighing system. If necessary, create an Application Programming Interface (API) to integrate with the Department's eTicketing Portal. Utilize the API to provide electronic data from the load read-out weighing system at the material source that is readable by the Department's eTicketing Portal. Update the load read-out weighing system and API as necessary to maintain connection the Department's eTicketing Portal.

The data shall be provided as follows:

| Reference Field No. | Description | Examples | Data Type | Required |
|---|---|---|---|---|
| 1 | Ticket Number | 5126349, 101R, 539-19 | String | Yes |
| 2 | Contract Number | T202011001 | String | Yes |

| | | | | |
|---|---|---|---|---|
| 3 | Contract Name (Job) | Walnut Street Streetscape Improvements | String | Yes |
| 4 | Contractor Name (Customer) | Mumford & Miller, Inc.; A Del Construction | String | Yes |
| 5 | Supplier Name | River Asphalt; Allan Myers Materials | String | Yes |
| 6 | Supplier Plant | Plant #1 Dagsboro; Dover Asphalt | String | Yes |
| 7 | Job Number (Location) | Task 1; Location 5 | String | Yes |
| 8 | Weigh Master Name | Johnny Scales | String | Yes |
| 9 | Weigh Master ID | 1234567 | String | Yes |
| 10 | Left Intentionally Blank | | | No |
| 11 | Mix Design ID (Product) | 1628p; AM-WILM-29 76-22 | String | Yes |
| 12 | Material Type (Product Description) | 9.5mm top; 19MM 76-22 NON CARB | String | Yes |
| 13 | Item No. (Product Code) | 401005; 401016 | String | Yes |
| 14 | Load Number | 75 | Number | Yes |
| 15 | Identifying Vehicle Number | T-1 | String | Yes |
| 16 | Hauler | John Doe Trucking | String | Yes |
| 17 | Legal Gross Vehicle Weight | 73,280 | Number | Yes |
| 18 | Loading Date & Time | 2020-06-15T13:45:30 | String | Yes |
| 19 | Gross Weight | 72,980 | Number | Yes |
| 20 | Net Weight | 27,900 | Number | Yes |
| 21 | Truck Tare Weight | 45,080 | Number | Yes |
| 22 | Void | 280 | Number | No |
| 23 | Daily Running Total | 44.43 | Number | Yes |

All provided weights shall be accurate to 0.01 tons.

Loads which do not have the required data shall be rejected.

**Setup and Calibration:**

Conduct a test of each supplier's integration with the Department's eTicketing Portal prior to shipping material. Complete test at least 14 days prior to shipping material unless otherwise approved by the engineer. The test must involve at least four calibration eTickets from each supplier approved for use on the project. The calibration eTickets must accurately reflect the categories 1-7 shown above; all other categories shall be marked *"TEST"*. After the engineer confirms the calibration eTickets have been entered into the Department's eTicket Portal, void the eTickets with the reason *"Calibration Testing"*.

**Uptime**:

Uptime reliability of the material supplier's ticketing system must be 99.5% over any 30-day rolling period. Uptime is defined as the ability for the Department to receive electronic tickets within a maximum of 10 minutes from when the ticket was created.

**Load Identification:**

Ensure the identifying vehicle numbers on the delivery vehicle correspond to the ticket. Place the numbers on the delivery vehicles such that at least one can be safely read from within the work area. Delivery vehicles without identifying vehicle numbers shall be rejected.

**Method of Measurement:**

The Department will not measure electronic ticketing.

**Basis of Payment:**

A. The cost associated with creating and maintaining an API, providing electronic ticketing data, and placing identifying vehicle numbers on the delivery vehicles is incidental to the item being placed.
B. The Department will make no payment for material that is rejected.

01/18/2022

## 763525 – ROAD USER COST

**Description:**

Road User Cost shall be assessed to compensate failure to open the project to unrestricted highway traffic on time in accordance with the contract's General Description.

**Method of Measurement:**

The Department will not measure Road User Cost.

**Basis of Payment:**

The assessment will be determined by the Road User Cost documentation in the General Description of the Contract.

8/3/23

## 763598 – FIELD OFFICE, SPECIAL I

## 763599 - FIELD OFFICE, SPECIAL II

**Description:**

This work consists of providing, erecting, equipping, maintaining, and removing modular offices and adjacent parking areas. These field office units may be situated in different locations. Each field office and parking area are for the exclusive use for Department personnel, engineers, designers, consultants, and inspectors.

**Materials:**

A. Each modular office and adjacent parking lot must meet the requirements in Table 1, Table 2, Table 3 and as described below:
   1. Weatherproof construction; tightly floored and roofed with air space above the ceiling for ventilation; and fully skirted with rigid, watertight covering overlapping the bottom of the exterior siding to the existing ground.
   2. Supported above the ground and safely secured to its support if the support is an in-ground anchored foundation or by tie-downs to the ground.
   3. Contain interior and exterior paneling, lighting, and plumbing fixtures.
   4. Provide suitable indoor toilet facilities in accordance with the requirements of state and local Boards of Health, or of other bodies or courts having jurisdiction in the area.
   5. Connect to the local water and sanitary lines. If public utilities are not available, utilize freshwater and wastewater holding tanks to provide with running water.
   6. Provide an adequate positive locking system on the inside of the restroom doorway to ensure privacy.
   7. When separate facilities for men and women are not available or required, place a sign with the wording "Rest Room" (letter height 1-inch minimum) over the doorway.
   8. Equip with heating and cooling capabilities to provide comfortable working conditions; this includes an exhaust fan, heating equipment, and air conditioning connected to an operational power source.
   9. Provide electrical, water, fuel, or other utility necessary to fully power HVAC equipment. If electrical service is not readily available from the utility provider, provide and maintain a temporary generator (including fuel) until power can be established.
   10. Perform or arrange all necessary utility connections and/or their maintenance.
   11. Provide maintenance of the heating, exhaust fan, and air conditioning equipment by validated service contracts for the length of the contract.

12. Provide maintenance of the potable water supply equipment, refrigerator, and microwave by validated service contracts for the length of the contract. Service contracts must allow a Department-authorized individual to deal directly with the service organization to request repair or maintenance.
13. Provide and maintain the interior with new furnishings. All furnishings must be approved by the engineer prior to installation in the modular field office. Office furnishings remain the property of the Contractor at the conclusion of the Project. Place the following furnishings as directed by the engineer:
    a. 12 folding chairs;
    b. 1 large conference table for a minimum of 12 people;
    c. 2 trash cans with lids and new plastic liners at each disposal interval – 1, 30+ gallons, 1, 10+ gallons;
    d. 2 dry erase boards a minimum of 4-foot x 3-foot each with markers and erasers;
    e. 1 floor mat at each entrance;
    f. 1 long-handled large-size broom with synthetic bristles and dustpan;
    g. 2 rough plan racks;
    h. 2 legal size filing cabinets with 4 drawers;
    i. 1 legal size fire-resistant filing cabinet with lock and key with 4 drawers and meeting underwriters' approval for not less than one hour test.
14. Provide and maintain the following office equipment for each modular field office; engineer must approve the equipment prior to installation in the field office. Deliver the equipment in new and working condition:
    a. 2 all-in-one print/copy/scan/fax machine capable of producing 35-pages per minute, double-sided, on 8 1/2-inch x 11-inch and 11-inch x 17-inch paper. Machine must be wireless capable and network capable and be able to print/copy/scan in color and in black and white;
    b. 2 combination electrical surge, spike, and noise protection devices.
15. Provide all consumables required for the office equipment and furnishings for the length of the contract. These consumables must be provided on request and include paper, tape, toner/printer ink, cleaning kits, and batteries. Provide maintenance of all office equipment by a validated service contract for the length of the contract. Service contracts must allow a Department-authorized individual to deal directly with the service organization to request repair.
16. 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. 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.
17. Provide and maintain a new telephone equipment system meeting the following requirements:
    a. 3 lines with a call forward busy feature with 1 line being dedicated to communication with the general public;

b. 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;
c. Locate telephone lines as directed by the engineer;
d. Allow a Department-authorized project person to deal directly with the telephone company to report outages and/or request repair;
e. Install and perform initial setup of the specified telephone system. Initial installation, setup costs, and final disconnection shall be the responsibility of the Contractor. All subsequent monthly billings, after initial installation and setup, for each field office telephone system shall be received and paid by the Contractor.

B. Construct a field office parking lot for each modular field office in accordance with all applicable city, county, state, and federal codes.
   1. The parking area and entrance pathways shall be a minimum of 6-inch graded aggregate subbase.
   2. Provide a stabilized construction entrance in accordance with Section 908 adjacent to the parking area within 25-feet of the water service connection.

C. Construct a stair and deck platform at each exterior door with hand and safety rails designed to last the life of the contract. Rails must 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.

D. Maintenance of the modular field office and its adjacent parking area includes the following:
   1. Remove snow and/or ice from the parking area and from the entrance pathways to the field office within 12-hours of each occurrence.
   2. Maintain and replace all provided items, furnishings, and equipment.
   3. Provide bottled water and drinking cups for the water cooler.
   4. Provide lavatory supplies, trash bags, and janitorial supplies.
   5. Provide replacement items for all lighting fixtures.
   6. Maintain all utilities including telephone system.
   7. Provide janitorial and waste disposal services twice a week.
   8. Clean up trash and debris from the parking lot once a week.
   9. Maintain the facilities in clean and good working condition; keep rest room stocked with adequate lavatory and sanitary supplies at all times during the period of the Contract.

E. Field Office, Special Type I consists of 1 single wide trailer measuring 50-foot length by 12-foot width.

F. Field Office, Special Type II consists of 1 single wide trailer measuring 50-foot length by 12-foot width and 1 double wide trailer measuring 50-foot length by 24-foot width.

G. Remove the field office from the premises when directed by the Department.

**TABLE 1. General Field Office Requirements for Each Modular Office**

| | |
|---|---|
| Doors Leading to Exterior | Minimum of 2 insulated doors; equip each with a keyed passage lock and a keyed deadbolt lock. |
| Electrical Outlets | Located a minimum of every 10 ft along each wall with a minimum of 2 outlets per room. |
| Exit Sign | 1 lighted "EXIT" sign for each exterior passage door. |
| Fire Extinguisher | 1 per exterior door; may be chemical or dry powder and be UL Classification 10-B:C (min.) and be suitable for Types A:B:C fires. |
| First Aid Kit | Commercial- or industrial-type first aid and safety kit suitable for Project conditions and hazards, including snakebites. |
| Height (Floor to Ceiling) | 8'-0" nominal. |
| Insulation | Exterior walls, ceiling, and floor must be insulated. |
| Internet Access | Via a broadband connection with WiFi access utilizing WPA2 security. Options include cable modem, DSL, or similar service; dial-up is not acceptable. Position the WiFi router to provide sufficient coverage in the field office with a minimum 50-ft radius. Provide 2 data jacks in locations indicated on the approved office plan accepted by the Department. Provide usernames and passwords for authorized wireless users as determined by the Department Construction Project Manager. Ascertain the means by which the Internet source will be provided. Provide Internet download and upload speeds of at least 100 Mbps at all times. Coordinate the Internet source with the Department Construction Project Manager to assure compatibility with the Department's hardware/software requirements. Provide and maintain an operational wireless access point. At the Department's sole discretion, a 4G LTE wireless hotspot may be acceptable. |

| | |
|---|---|
| Keys | Minimum of 2 complete sets; give to the engineer's representative. |
| Lighting | One 4,000-lumen overhead light centrally located and evenly spaced every 10 ft along the interior ceiling, with a minimum of 1 overhead light per room. |
| Microwave | New; minimum 900 watts. |
| Other Material Requirements | Free of asbestos and all other hazardous materials. |
| Parking Spaces | 12 functional spaces, each measuring 9'-0" x 20'-0". |
| Refrigerator | New; minimum 2.6 cubic ft. |
| Smoke Detector | New; minimum 1 working combination smoke and carbon dioxide detector per room. |
| Water Cooler | New potable water cooler with hot and cold taps; minimum 5-gallon capacity; maintain a supply of at least 5 gallons of extra water at all times. |
| Windows | Minimum of 6 insulated windows total; minimum glass area of 1,150 sq inches per window. Equip each window with a horizontal mini-blind covering the full glass area, a screen, and a locking device. Cover exterior of each window with steel bar grids. |
| Water Service Connections | At least 1 outside water service connection 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. |

**TABLE 2. Field Office Requirements for Single Wide Modular Field Office**

| | |
|---|---|
| Exterior Dimensions | The single-wide field office shall have minimum exterior dimensions of 50’-0” length by 12-0” width. |
| Floor Space | The single-wide field office shall be new and have a minimum floor space of 600 square feet. |
| Furnishing Requirements | 2 full-size office desks. Each with filing drawer and fully adjustable ergonomic design swivel chair with armrests and 5-leg base having wheel casters. |

**TABLE 3. Field Office Requirements for Double Wide Modular Field Office**

| | |
|---|---|
| Exterior Dimensions | The double-wide field office shall have minimum exterior dimensions of 50'-0" length by 24'-0" width. |
| Floor Space | The double-wide field office shall be new and have a minimum floor space of 1,200 square feet. |
| Furnishing Requirements | 6 full-size office desks. Each with filing drawer and fully adjustable ergonomic design swivel chair with armrests and 5-leg base having wheel casters. |

**Construction:**

A. General Requirements:

1. The Engineer will issue a Notice to Proceed and stipulate the date on or before which the Contractor is expected to begin work in accordance with Section 108.2. Have the office units, their entrances, and their adjacent parking areas and all materials and equipment ready for use at least 7 calendar days prior to the date on which the work is expected to begin as stipulated in the Notice to Proceed and before any construction operations begin. Contract time charges will begin on the day work actually starts or on the date stipulated in the notice to proceed, whichever is earlier. There will be no delays in beginning the contract time charges due to delays in preparing the field office complex.
2. The Contractor is responsible for obtaining all required licenses and permits for installation, and placement of the field office and its parking area.
3. The field office must be available for use by the Department continuously throughout the duration of the Project.

B. Submittals:

1. Submit a specific location layout drawing and construction details for the proposed field office and its parking area for approval by the engineer.
2. Submit a copy of all validated field office, equipment, and maintenance service assistance and/or monitoring agreements and/or contracts as mentioned herein to the Department's administrative office on or before the first day the field office is ready for use.

**Method of Measurement:**

The Department will not measure field offices.

**Basis of Payment:**

A. The Department will pay for field office at the contract unit price per each month that the field office is acceptably provided as determined by the engineer. Partial months will be paid at the rate of 0.033-months per day. Price and payment will constitute full compensation for:

1. Providing, placing, and maintaining all materials;
2. installation and maintenance of stabilized construction entrance;
3. submittals and all drawings;
4. removal and restoration of each field office area, entrance, and adjacent parking area to original conditions;
5. removing hazardous material and/or underground tanks;
6. obtaining licenses and permits; and
7. all incidentals required for the Work.

01/31/2024

# 763626 - DIESEL FUEL COST PRICE ADJUSTMENT

**Description:**

This section defines the criteria for payments to the Contractor to reflect increases or decreases in the cost of diesel fuel consumed in the performance of applicable construction work.

**Contract Applicability:**

To have the Diesel Fuel Cost Price Adjustment provisions apply to this project, a properly completed Diesel Fuel Cost Price Adjustment Option form must be submitted to the Department with the Bidder's bid proposal. If a properly completed Diesel Fuel Cost Price Adjustment Option form is not provided by the bidder, the Department will consider the option to apply the Diesel Fuel Cost Price Adjustment provisions for the project to be declined. No further opportunity to elect Diesel Fuel Cost Price Adjustment for the project will be made available.

**Price Adjustment Provisions:**

A. These price adjustment provisions apply to contract items in the contract schedule of prices as grouped by category. Specific pay items to be adjusted are attached as an appendix to this Special Provision. General category descriptions and the fuel usage factors which are applicable to each are as follows:

1. Categories:

| Category | Description | Applicability |
|---|---|---|
| A | Earthwork | The combined total of applicable item plan quantities must exceed 5,000 CY. |
| B | Subbase and Aggregate Base Courses | The combined total of applicable item plan quantities must exceed 500 tons. |
| C | Bituminous Materials (Bases and Pavements) | The combined total of applicable item plan quantities must exceed 500 tons. |
| D | Rigid Materials (Bases and Pavements) | The combined total of applicable plan quantities must exceed 5,000 CY. |
| E | Structures | Contract items will be based upon the total value of work performed for each structure including any associated work, i.e. items not grouped under Categories A thru D. |

2. Diesel Fuel Usage Factors:

| Category | Description | Factor | Units |
|---|---|---|---|
| A | Earthwork | 0.34 | Gallons per CY |
| B | Subbase and Aggregate Base Course | 0.64 | Gallons per Ton |
| C | Flexible Bases & Pavements | 2.98 | Gallons per Ton |
| D | Rigid Bases & Pavements | 0.98 | Gallons per CY |
| E | Structures | 6.76 | Gallons per $1,000 of work performed |

| Category | Conversion | Factor |
|---|---|---|
| B | SY to ton | 90 lbs/sy-in |
| C | SY to ton | 112.5 lbs/sy-in |
| D | SY to CY | Inches of depth/36 |

3. Delaware Posted Diesel Fuel Price will be issued monthly by the Department at https://deldot.gov/Business/bids/index.shtml?dc=diesel_fuel.
    a. The Project Base Price Index (FB) is the index price posted by the Department on the project advertisement date in $/gallon.
    b. The Fuel Price Index for adjustment (FP), will be the index price posted by the department monthly in $/gallon.

**Price Adjustment Determination:**

A. The following criteria and conditions will be considered in determining a price adjustment for diesel fuel cost fluctuations on a monthly basis.
    1. Unit Price Adjustment Calculation.

a. When the ratio FP/FB is calculated to be less than 0.95 or calculated to be greater than 1.05, the Department will adjust unit bid price prices in accordance with the following formula:

AUP = (FP-FB)(F)+(UBP)

where:

AUP = Adjusted Unit Price

FP = Fuel Price Index for the month in which prices are adjusted for applicable construction work.

FB = Project Base Price Index

F = Diesel Fuel Usage Factor (See above chart in section 1.2 for usage factors.)

UBP = Unit Bid Price specified in the Contractor's Bid Proposal

**Payment of Adjusted Unit Prices:**

A. The unit bid prices of work items affected by the fuel escalation will be adjusted by change order, either up or down. The Diesel Fuel Price Index will be used for all the applicable items performed during the monthly period.

B. If the Contractor exceeds the authorized allotted completion time, the adjusted item prices on the last authorized allotted calendar day or working day shall be the prices used during the time liquidated damages are assessed. However, if the posted price for diesel fuel goes down, the item prices shall be adjusted downward accordingly.

C. Upon completion of the work and determination of final pay quantities, an adjusting work order will be prepared to reconcile any difference between estimated quantities previously paid and the final quantities. In this situation, the value for FP used in the price adjustment formula will be the average of all FP's previously used for computing price adjustments.

D. The Department reserves the right to inspect the records of the prime contractor and its subcontractors and material suppliers to ascertain actual pricing and cost information for the diesel fuel used in the performance of applicable items of work.

E. When applicable items of work, as specified herein, are added to the contract as Extra Work in accordance with the provisions of Section 104.2.E, no price adjustment will be made for fluctuations in the cost of diesel fuel consumed in the performance of the extra work, unless otherwise approved by the Engineer. The current price for diesel fuel is to be used when preparing required backup data for extra work to be performed at a negotiated price. For extra work performed on force account basis, reimbursement for material and equipment along with specified overhead and profit markups will be considered to include full compensation for the current cost of diesel fuel.

Any Price Increases or Price Rebates that are calculated based on items of work performed by subcontractors will be added to or deducted from payments due to the Contractor in the appropriate pay period. The Contractor shall then accurately record on the appropriate CN-103 form the additions or deductions into adjusted contract value. The Contractor shall make payment to the subcontractor(s) who actually performed the work in accordance with DelCode Title 17, Chapter 8.

## Appendix - Item 763626 Diesel Fuel Cost Adjustment

| | Item Numbers |
|---|---|
| **Category A:** Earthwork Excavation & Embankment, Borrow (total qty must exceed 5000 CY) | 202000, 202003, 207000, 207021, 209001, 209002, 209006 |
| **Category B:** Subbase and Agg. GABC, PTB, Soil Cement Base (total qty must exceed 500 T) | 301001, 302002 |
| **Category C:** Flexible Bases and Pavements Warm Mix Asphalts (total qty must exceed 500 T) | 401014, 401016, 401036, 401046 |

# 806500 – TRAFFIC OFFICERS

## Description:

In accordance with Section 806.1.

## Materials:

Not applicable.

## Construction:

In accordance with Section 806.3.

## Method of Measurement:

In accordance with Section 806.4.

## Basis of Payment:

A. The Department will pay for traffic officers at the contract unit price per hour. Price and payment constitute full compensation for providing traffic officers, vehicles, and equipment.
B. For bidding purposes, the Department has fixed the unit price at $180.00 per hour. The Department will pay for traffic officers based on a submitted invoice from the police department plus 10 percent.

**850520 - LUMINAIRE (LED), 150 WATTS HPS EQUIVALENT**

**850521 - LUMINAIRE (LED), 250 WATTS HPS EQUIVALENT**

**850522 - LUMINAIRE (LED), 400 WATTS HPS EQUIVALENT**

**850523 - LUMINAIRE (LED), 640 WATTS HPS EQUIVALENT (HIGH MAST ONLY)**

**850524 - LED WALL PACK, 250 WATTS HPS EQUIVALENT**

**850525 - LED WALL PACK, 400 WATTS HPS EQUIVALENT**

**850526 - LED WALL PACK, 75 WATTS HPS EQUIVALENT**

**850527 - LED WALL PACK, 150 WATTS HPS EQUIVALENT**

## Description.

This work consists of providing and installing an LED light fixture (luminaire) on pole (not inclusive in this item) with wattage, lamp type and distribution type.

## Materials.

The LED Wattages above are based on the equivalent output to HPS lighting. Refer to maximum LED Wattages below.

Provide a complete fixturewith a heavy-duty, cast-aluminum housing, door with extruded aluminum heat sink, tool-less entry, hinged removable power tray door for easy maintenance, and have fastening hardware that is stainless steel or zinc plated steel. The fixture shall meet ANSI 136.31 3.0 G vibration requirements. Fixture shall have a two-bolt slip fitter system for mounting on a 1 1/4-inch to 2 3/8-inch mounting arm connection. A grey powder coat finish shall be applied to the fixture unless otherwise shown on the plans, or as directed by the engineer.

The fixture shall also meet the following criteria:

1. Lamps: LED
2. Wattage:

a. 50 Watt Maximum for Item No. 850526

b. 90 Watt Maximum for Item No. 850520 and 850527

c. 175 Watt Maximum for Item No. 850521 and 850524

d. 250 Watt Maximum for Item No. 850522 and 850525

e. 450 Watt Maximum for Item No. 850523

3. Voltage: 120V - 277V

4. CRI: 70 Minimum

5. Lumens:

    a. 3,000 to 5,000 for Item No. 850526

    b. 8,000 to 12,000 for Item No. 850520 and 850527

    c. 16,00 to 20,000 for Item No. 850521 and 850524

    d. 27,000 to 31,000 for Item No. 850522 and 850525

    e. 40,000 to 50,000 for Item No. 850523

6. Rated L70 Lamp Life: 100,000-hours minimum when operated at 77-degrees F.

7. Distribution: Type II or Type III (unless otherwise indicated).

8. Color Temperature: 3,000 K - 4,500 K.

9. Drive Current: 850-mA maximum.

10. Driver: 0-10V dimming.

11. IP66 Rating for optical portion of the housing.

12. 10kV/10kA minimum internal surge suppression module, meeting UL 1449/ANSI C62.41.2 Category C.

13. 3 Pin NEMA Photocontrol Receptacle with a Shorting Cap.

Luminaire mounting height shall be as indicated on drawings. Luminaire shall provide point illumination of not less than the given values in the table that follows:

| Luminaire | Foot-candle Point Table | |
|---|---|---|
| | Point 1 | Point 2 |
| Luminaire (LED), 75 Watts HPS Equivalent | 0.10 | 0.11 |
| Luminaire (LED), 150 Watts HPS Equivalent | 0.16 | 0.22 |
| Luminaire (LED), 250 Watts HPS Equivalent | 0.27 | 0.37 |
| Luminaire (LED), 400 Watts HPS Equivalent | 0.46 | 0.55 |
| Luminaire (LED), 640 Watts HPS Equivalent | 0.55 | 0.60 |

coordinates are 90 feet longitudinal distance. Point 2 coordinates are 90-feet longitudinal and 30-feet transverse. The point values given in the table are based on a 30-foot mounting height with a Light Loss Factor of 1. The point values produced by the submitted fixture shall be included with the fixture submittal.

Metal Parts shall be free of burrs and sharp corners and edges. Doors, frames, and other internal access shall be smooth operating and free of light leakage under operating conditions.

Factory applied labels shall comply with UL 1598. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place. Labels shall include the following lamp characteristics:

1. CCT and CRI for all luminaires

Luminaire finish shall be manufacturers standard paint applied to factory-assembled and tested luminaire before shipping.

**Construction.**

A. Install luminaires in accordance with the manufacturer's installation instructions and shall follow the following installation requirements:

1. Comply with NECA 1.
2. Fasten luminaire to pole.
3. Install luminaires at height indicated on drawings and level and square with finished grade.
4. Perform an illumination test.

B. Luminaire identification decals shall be installed to the luminaire housing in accordance with NEMA conventions. Ensure the decal is readily visible from the ground and meets ANSI C136.15-2015 Roadway and Area Lighting Equipment-Luminaire Field Identification standard.

C. After installation of luminaires and control devices and after electrical circuitry has been energized, test units to confirm proper operation.

D. Inspect each installed luminaire for damage. Replace damaged luminaires and components.

E. Luminaires will be considered defective if they do not pass tests and inspections. Provide fixture cutsheets, details, and the IESNA LM-79 and LM-80 test reports to the engineer for shop drawing review before purchasing.

F. Provide documentation that demonstrates that the proposed model of LED luminaire has been tested for electromagnetic compliance following the measurement protocols specified in ANSI standard C63.4-2003 and required by 47 CFR 15.31.

G. If the Contract require each light fixture to be provided with an independent photoelectric control device, provide a photocell with each lighting fixture in place of the shorting cap. Provide photoelectric control using solid state circuitry, cadmium sulfide type with hermetically sealed silicone rectifier rated 120-volt, 60-cycle AC and 1000-watts maximum load. Provide photoelectric control with "Fail On" functionality such that in the event of a photocell becoming inoperative, the light fixture will remain in a permanent "On" state through day and nighttime hours. Photo control shall be twist lock type, with suitable mounting bracket with locking type receptacle.

H. The photoelectric control shall be set to operate, by default factory setting or by field adjustment, using the following criteria:

1. Turn on the light fixture at a minimum vertical illumination value of 3-foot-candles.

2. Turn off the light fixture at a maximum vertical illumination value of 6-foot-candles.

I. All electrical materials shall conform to the requirements of the National Electrical Code of the National Fire Protection Association, and to all local and state laws and/ordinances governing such installations.

**Method of Measurement.**

The Department will measure the quantity of LED luminaires as the number luminaires provided, installed, and accepted.

**Basis of Payment.**

A. The Department will pay for LED luminaires at the contract unit price of each luminaire installed, and accepted. Price and payment will constitute full compensation for:

1. All materials, including the luminaires; and

2. incidentals required to complete the Work.

2/9/23

## 908503 - WETLAND MITIGATION SEED MIX

**Description:**

This work consists of providing and placing seed in wetland mitigation area.

**Materials:**

Wetland mitigation seed mix requirements:

| | Max.% Weed Seeds | Min.% Purity | Min.% Germination | Seeding Rate (lb/Ac) |
|---|---|---|---|---|
| Big Bluestem (*Andropogon gerardii*) | 1.00 | 85 | 75 | 5 |
| Deertongue (*Dichanthelium clandestinum*) | 1.00 | 95 | 60 | 20 |
| Switchgrass (*Panicum virgatum*) | 1.00 | 95 | 70 | 15 |
| Sneezeweed (*Helenium autumnale*) | 5.00 | 75% | 50 | 0.5 |
| | | | Total Seed Quantity (lb/Ac) | 40.5 |

Provide seed that is fresh, clean, from new crop seed, and delivered to the site in original unopened tagged packages in accordance with Delaware Code and respective State laws.

**Construction:**

A. Complete seeing in accordance with Section 908.3 and as dictated in the Plans.

B. Apply the Wetland Mitigation Grass Seeding between the following dates: March 1st to April 15th.

C. Use Low-pressure tires or equipment for preparation of the seed bed and on seeding equipment.

D. No Lime or Fertilizer is permitted in the Wetland Mitigation Grass Seeding.

**Method of Measurement**

The Department will measure Wetland Mitigation Seed Mix by the square yard.

**Basis of Payment:**

The Department will pay for Wetland Mitigation Seed Mix at the contract unit price per square yard and in accordance with Sections 908.5.D and 908.5.E.

10/15/2024

## 908524 – CONCRETE BLOCK LINING

### Description:

This work consists of providing and installing tied concrete block mats.

### Materials:

A. Acceptable Tied Concrete Block Mat with Doubled Layered Underlayment systems are:
   1. Flexamat Standard, manufactured by Motz Enterprises, Inc. (see https://www.flexamat.com/flexamat-erosion-control-solutions )
   2. Approved equal

### Construction:

A. Provide block mats at the wetland mitigation site in the areas in accordance with the plans, this specification, and the manufacturer's recommendations.

B. Prepare the subgrade to provide a clean, smooth, firm, and unyielding base for the concrete block matting.

C. If vegetation is specified, place the topsoil and required seeding prior to installing the concrete block matting.

D. Install mats to the line and grade in accordance with the plans and per the manufacturer's guidelines. Contact the manufacturer or authorized representative to provide technical assistance during preparation and installation of the concrete block mats as needed.

E. Provide a minimum 18 in. deep concrete mat embedment toe trench at all edges exposed to concentrated flows. Recess exterior edges subject to sheet flow a minimum of 6 inches.

F. Provide fastening or anchoring in accordance with the manufacturer's recommendations or engineer for the site conditions.

### Method of Measurement:

A. The Department will measure the quantity of concrete block lining in square yards, complete, in place and accepted.
B. The embedment toe trench will not be measured.

### Basis of Payment:

A. The Department will pay for concrete block lining at the contract unit price per square yard. Price and payment will constitute full compensations for:
   1. Providing and installing the concrete block matting system including all underlayment and fabric;
   2. providing and installing the embedment toe trench;
   3. grading and shaping the subgrade;
   4. fastening and anchoring devices; and
   5. equipment, labor, materials and any incidentals to complete the work.

07/19/2022

# 908527 - REFORESTATION

## Description:

This work consists of providing, transporting, storing, and placing plants for reforestation.

## Definitions:

The word "trees" is used as a general term for seedlings and saplings of both tree and shrub species.

## Materials:

A. Plant Quality & Size Requirements:
   1. Plants must be true to type and nomenclature and typical of their species or variety.
   2. Plants must have a normal habit of growth with well-developed branch systems and vigorous root systems.
   3. Plants must be sound, healthy and vigorous plants, free from visible defects, disfiguration, injury, recognizable disease of any kind, insect eggs, borers and any infestation.
   4. Plants must be nursery grown in a growth medium subject to approval by the Department. It will be the responsibility of the Contractor to inspect the plants before removal from the nursery where they have been grown to make sure that the plants meet these requirements.
   5. Plants must conform to all sizes and measurements detailed in these specifications or as indicated on the plans.
   6. Cull unacceptable plants at the nursery prior to being packed. No substitutions for any materials shall be made unless agreed to in writing by the Department. With the approval of the Department, plants larger in size than specified may be utilized, but such plants shall not increase the contract price. Plants must have a form and architecture that is easily planted for the stock specified.

B. Pine Bare Root Specifications and Requirements:
   1. For Loblolly Pine (*Pinus taeda*).
      a. Target root collar diameter of 7/32-inch.
      b. Minimum culling root collar diameter of 6/32-inch.

c. Target height of 10-inches, measured from root collar to terminal apical bud.
d. Minimum culling height of 8-inches , measured from root collar to terminal apical bud.

2. For Pitch Pine (*Pinus rigida*).
   a. Target root collar size of 5/32-inch.
   b. Minimum culling root collar diameter of 4/32-inch.
   c. Target height of 7-inches, measured from root collar to terminal apical bud.
   d. Minimum culling height of 4-inches, measured from root collar to terminal apical bud.
3. For Shortleaf Pine (*Pinus echinata*).
   a. Target root collar size of 6/32-inch.
   b. Minimum culling root collar diameter of 4/32-inch.
   c. Target height of 8-inches, measured from root collar to terminal apical bud.
   d. Minimum culling height of 6-inches, measured from root collar to terminal apical bud.
4. For Virginia Pine (*Pinus virginiana*).
   a. Target root collar size of 6/32-inch.
   b. Minimum culling root collar diameter of 4/32-inch.
   c. Target height of 8-inches, measured from root collar to terminal apical bud.
   d. Minimum culling height of 6-inches, measured from root collar to terminal apical bud.
5. For White Pine (*Pinus strobus*).
   a. Target root collar size of 1/4-inch.
   b. Minimum culling root collar diameter of 6/32-inch.
   c. Target height of between 10 and 12-inches, measured from root collar to terminal apical bud.
   d. Minimum culling height of 8-inches, measured from root collar to terminal apical bud.

6. All pines must have the following characteristics:
   a. A vigorous compact, fibrous root system with a minimum taproot length of 5 1/2-inches and a target taproot length of 6 to 7-inches. Each seedling should have a minimum of six first order lateral (side) roots derived from the main taproot. A minimum number of between eight and ten first order lateral roots is strongly preferred.
   b. Presence of secondary needles.
   c. Dormant tree with tight buds and little or no new root growth.
   d. Free of recognizable disease and mechanical damage.
   e. A continuous bark. Cambium green or yellowish in coloration.
   f. After lifting the stock from the growing beds and prior to bagging, apply a kaolin clay emulsion to the entire root system of all bare root stock. If specified on the plans or agreed to in writing by the Department, a gel emulsion may be utilized for the root treatment in lieu of the kaolin clay.

C. Hardwood and Bald Cypress Bare Root (*Taxodium distichium*).
   1. A minimum and target root collar diameter of 3/8-inch.
   2. Minimum height of 16-inches measured from root collar to tip.
   3. Target height of 24-inches measured from root collar to tip; a maximum height of 36-inches measured from root collar to tip.
   4. Dormant tree with tight buds and little or no new root growth.
   5. A vigorous compact, fibrous root system with a minimum taproot length of 8-inches and a target length of 8 to 10-inches, as measured prior to pruning.
   6. Provide plants having a minimum of six first order lateral (side) roots derived from the main taproot. A minimum number of between eight and ten first order lateral roots is strongly preferred.
   7. Unless directed otherwise by the Department, prune or undercut taproots and lateral roots greater than 8-inches in length at the nursery according to best forestry practices to a length of 8-inches.
   8. An early undercut of the stock is allowed. However, the resulting delivered stock shall be readily plantable and the stock shall not have "mop-head or paintbrush" root systems that are difficult to plant as herein specified.
   9. Free from recognizable disease and mechanical damage.
   10. A continuous bark. Cambium green or yellowish in coloration.
   11. After lifting the stock from the growing beds and prior to bagging, apply a kaolin clay emulsion to the entire root system of all bare root stock. If specified on the plans or agreed to in writing by the Department, a gel emulsion may be utilized for the root treatment in lieu of the kaolin clay.

D. Atlantic White Cedar (*Chamaecyparis thyoides*) Tubling.
   1. A target root collar diameter of 3/8-inch. A minimum culling root collar diameter of 1/4-inch.
   2. Target height of 15 to 12-inches. A minimum culling height of 12-inches measured from root collar to tip.
   3. A vigorous compact, fibrous root system with minimum taproot length of 6 1/2-inches and a target taproot length of 7 1/2-inches. The root system shall fully occupy the growing cell.
   4. Dormant tree with tight buds and little or no new root growth.
   5. A minimum of six first order lateral (side) roots derived from the main taproot. A minimum number of between eight and ten first order lateral roots is strongly preferred.
   6. Provide an extracted root system conforming to the shape and dimensions of the growing cells without sloughing soil or growth media, as determined during the on-site inspection. Materials not conforming to the dimensions of the cell may be rejected without compensation.

7. Provide an extracted root system having the majority of the roots in vertical orientation. If the horizontal roots are thick and flattened and the root plug stays in a thick net the shape of the original plug when the media is shaken loose, the tree will be determined to be "pot bound" and shall be considered unacceptable stock.
8. Free from recognizable disease and mechanical damage.
9. A continuous bark. Cambium green or yellowish green in coloration.
10. The growing cells shall have minimum cavity depth of 8-inches, a minimum cavity diameter of 1 1/2-inches, and a minimum cavity capacity of 10-cubic inches. The inner surface of the cell wall shall be vertically ribbed the full length of the cell wall in a manner that promotes downward root growth and limits root spiralling (USDA, Forest Service, Agricultural Handbook 674, Volume 2). Each cell shall have a minimum of four inner ribs.
11. Propagate the Atlantic White Cedar by stem cuttings. Obtain the stem cuttings from juvenile plants growing in wetland environments or orchard stock derived from wetland environments.
12. Grow and transport the Atlantic White Cedar as tublings in propagation cells, and not as bare root stock or extracted plugs. To ease field extraction, provide tubling cells free of individual cells and not molded into multiple cell units. Manufacture the tubling cells from either low-density or high-density polyethylene with bottom drainage. Prohibit use of Styrofoam blocks or Styrofoam cells when culturing Chamaecyparis because of problems associated with fine root penetration into Styrofoam walls and torn roots following extraction.
13. Provide Atlantic White Cedar, the growth media of either:
    a. 2 parts coarse perlite: 1 part Sphagnum peat moss by volume.
    b. 1 part coarse perlite: 1 part Sphagnum peat moss by volume.

    Growth media shall be provided for entire growing cell.

    Provide 6-inch cuttings that are 10,000 ppm IBA-dipped (Indolebutyric acid). Propagate the cuttings with mist or polytent with bottom heat during the winter months. Unless authorized in writing by the Department or as directed on the plans, follow the propagation guidelines for Chamaecyparis thyoides as found in The Reference Manual of Woody Plant Propagation: From Seed to Tissue Culture by Michael Dirr and Charles Heuser (Varsity Press, Inc., Athens, Georgia, 1987) and in Manual of Woody Landscape Plants: Their Identification, Ornamental Characteristics, Culture, Propagation and Uses by Michael Dirr (Stipes Publishing Company, Champaign, Illinois, 4th Edition, 1990).

E. Shrub Bare Root.
   1. A target root collar size of 7/32-inch. A minimum culling root collar diameter of 6/32-inch.
   2. Minimum height of 12-inches measured from root collar to tip.
   3. Target height of 18-inches measured from root collar to tip; a maximum height of 30-inches measured from root collar to tip.
   4. Dormant shrub with tight buds and little or no new root growth.
   5. A vigorous compact, fibrous root system with a minimum taproot length of 8-inches and a target length of 8 to 10-inches, as measured prior to pruning.
   6. A minimum of six first order lateral (side) roots derived from the main taproot. A minimum number of between eight and ten first order lateral roots is strongly preferred.
   7. Unless directed otherwise by the Department, prune or undercut taproots and lateral roots greater than 8-inches in length at the nursery according to best forestry practices to a length of between 6-inches and 8-inches.
   8. Allow an early undercut of the stock shall. However, the resulting delivered stock shall be readily plantable and the stock shall not have “mop-head” or “paintbrush” root systems that are difficult to plant as herein specified.
   9. Free from recognizable disease and mechanical damage.
   10. A continuous bark. Cambium green or yellowish in coloration.
   11. After lifting the stock from the growing beds and prior to bagging, apply a kaolin clay emulsion to the entire root system of all bare root stock. If specified on the plans or agreed to in writing by the Department, a gel emulsion may be utilized for the root treatment in lieu of the kaolin clay.

F. Containerized Plug.
   1. Stock age and type as shown on the plans.
   2. Target root collar diameter and minimum root collar diameter as shown on the plans.
   3. Target height and minimum height measured from plug surface to apical tip as shown on the plans.
   4. Dormant tree with tight buds and little or no new root growth.

5. A vigorous compact, fibrous root system with minimum taproot length and a target taproot length as shown on the plans.
6. A minimum of six first order lateral (side) roots derived from the main taproot. A minimum number of between eight and ten first order lateral roots is strongly preferred.
7. An extracted root system conforming to the shape and dimensions of the growing cells without sloughing soil or growth media, as determined during the on-site inspection. Materials not conforming to the dimensions of the cell may be rejected without compensation.
8. An extracted root system having the majority of the roots in vertical orientation. If the horizontal roots are thick and flattened and the root plug stays in a thick net the shape of the original plug when the media is shaken loose, the tree will be determined to be "pot bound" and shall be considered unacceptable stock.
9. Free from recognizable disease and mechanical damage.
10. A continuous bark. Cambium green or yellowish in coloration.
11. The top 1-inch of conifer stock shall possess stiff foliage and stems with firm terminal buds as a sign of proper hardening of the stock.

G. General Material Requirements:
   1. For all container stock (tublings and plugs), the growing methodology, arrangement and placement of growing cells in the nursery shall be done in a manner that promotes “air pruning” at the bottom drainage hole of the cavity (USDA, Forest Service, Agricultural Handbook 674, Volume 2). Unless specified on the plans, plug stock may be grown in individual free cells, joined cells or in polystyrene (Styrofoam) blocks. Each cell shall have a minimum cavity depth, minimum cavity capacity and minimum cavity diameter as measured at the top of the cell, as specified on the plans. The size of the cell should be sufficient to promote the natural root formation and inhibit the crowding and knotting of the root system. The choice of propagation cells, tube and growing trays shall be subject to approval by the Department.
   2. Genetic Origin.
      a. Provide complete information as to the genetic origin of all plant stock, by county and state. Make every effort to obtain plant materials whose genetic origin is the Delmarva Peninsula. Of second preference is genetic stock derived from the Mid-Atlantic Coastal

Plain. In the case of search failure in procuring materials whose genetic origin is the Delmarva Peninsula or the Mid-Atlantic Coastal Plain, limit the genetic origin of all stock, except for pine (*Pinus*), to the areas north of and including North Carolina and Tennessee, east of and including Ohio, Kentucky and Tennessee, and south of and including Massachusetts and New York. Derive the seed source for all loblolly pine (*Pinus taeda*) from the eastern shore of the Delmarva Peninsula. All other pine stock is limited in origin to the states of Delaware, New Jersey, Maryland and Virginia. Plants may be grown in nurseries outside of these geographical boundaries, subject to approval by the Department, but the genetic origin of the materials must meet the above geographical specifications. Choose the genetic origin to provide typical forms of the species and include the capacity to bear fertile fruits, as approved by the Department.

3. Nomenclature.
   a. For all plants, A Synonymized Checklist of the Vascular Flora of the United States, Canada and Greenland: Volume II—the Biota of North America (Kartesz and Kartesz, University of North Carolina Press, 1980, or later edition) shall be the authority for the plant names. Supply certification from the suppliers that the plants are those specified or agreed to under substitution.
4. Mycorrhizae Inoculation.
   a. If indicated on the plans, inoculate plant stock with mycorrhizae as specified and according to best forestry practices, as solely determined by the Department.
5. Miscellaneous Materials.
   a. All shipping materials, equipment, planting tools, planting bags, tubling carriers, tarps and incidentals necessary to complete the work are subject to approval by the Engineer. Do not use and remove from the site by the close of the working day any Sub-standard, defective or damaged tools and items, as determined by the Engineer. Specialized planting tools or tool configurations may be required, as specified on the plans or in the bid documents.
6. The kaolin clay slurry utilized must be recognized as suitable for root protection within the forestry industry and is subject to approval by the Department. If the use of a gel root coating is proposed by the Contractor, supply to the Department the name of the gel and manufacturer's product information for the gel with a written request for the usage of the gel. The gel utilized is subject to approval by the Department.

7. Provide an OST bar (dibble bar) to be utilized in the planting having a minimum 38-inches in length, a blade having a minimum of 3-inches wide and a minimum length of 10 1/4-inches. The thickness of the blade at the handle shall be a minimum of 3/4-inch.
8. Provide a KBC bar utilized in the planting having a minimum of 39-inches in length, a blade having a minimum of 4-inches wide at the middle of the blade, and a minimum length of 12-inches. The thickness of the blade at the handle shall be a minimum of 1-inch.
9. Provide hoedads for Atlantic White Cedar and bareroot hardwood plantings, each having a minimum blade length of 17-inches and a minimum width of 4-inches. If upon inspection of the plant material by the Department, it is determined that planting with a hoedad of a minimum blade length of 15-inches is appropriate, the Contractor may utilize those blades. Do not use hoedads specifically designed for plug plantings for the planting of bareroot hardwoods or Atlantic White Cedar.
10. Use the type, size, caliper and length of the required cylindrical dibble or plug extractor for the planting of tubling or plug stock as specified on the plans or by the Engineer. This information will be made available to the Contractor no later than 60-days prior to the opening of the planting window. When a cylindrical dibble planting or a plug extraction planting is specified, as back-up planting tools, the Contractor is required to have on site at least the minimum number of hoedads necessary to hand plant the stock while fully utilizing all members of the planting crew.
11. All planting bags shall be specifically designed for reforestation work with reflective bag liners or insulated liners. Utilize bags free of holes and in good condition. All bags shall be subject to approval by the Engineer. For hardwood and bald cypress trees, use a planting bag having a minimum diameter of 12-inches and 18-inches depth. For other conifers, use a planting bag having a minimum diameter of 12-inches and a depth of 15-inches or as approved by the Engineer. Use waterproof polyurethane insulated planting bags if specified on the plans. If tubling carriers are to be utilized by the planting crews, all tubling carriers are subject to approval by the Engineer.
12. Transport of materials will likely require the use of 4-wheel-drive vehicles equipped with appropriate off-road tires and capped transport beds. If directed by the Engineer, such vehicles shall be utilized without additional compensation by the Department. Smaller all-terrain vehicles may be useful for on-site transport. Regardless, the Contractor shall have a sufficient number of vehicles of the capability to transport the materials and efficiently supply

the planting crews with trees, as solely determined by the Engineer.

13. Use freshwater free from toxic substances and chemicals injurious to vegetation for the plant stock and to maintain the proper moisture levels in the planting bags. Salt or brackish water may not be used. All water sources are subject to approval by the Department.
14. Provide Perlite having an average particle size more than 3-millimeters.
15. Provide *Sphagnum* peat moss having a minimum 90 percent organic material with a minimum of 75 percent of the organic content being derived from the genus *Sphagnum*.
16. Use jute burlap with a dry weight of approximately 8-ounces per square yard. If used in conjunction with planting bags, soak new jute burlap in water for a minimum of 24-hours prior to use.
17. Provide tree shelters as specified below, or an approved equal as determined by the Department, and stakes having the nominal lumber as indicated in the contract.
    a. Tubex®: Manufacturer is Treessentials
       https://www.tubex.com
    b. Tree Pro: Manufacturer is Tree Pro
       https://www.treepro.com
    c. Blue-X®: Manufacturer is Blue-X Enterprises, Inc.
       https://www.growtube.com

H. Plant Lifting/Culling/Packaging/Nursery Storage:

1. Perform lifting, packing and storage of plants according to best forestry practices, as solely determined by the Department. Unless authorized by the Department, all lifting shall be preceded by lateral pruning and prelift undercutting to finalize the plant size. The lateral root pruning may occur several months prior to the actual lifting of the plants.
2. If a plant species is suitable for cold storage placement, do not lift trees until they have accumulated a minimum of 600 chilling hours and no trees are to be lifted prior to January 15 or as specified on the plans. Whenever possible, do not lift trees until the accumulation of 1,200 chilling hours, but lift all plants prior to dormancy release. Chilling hours are defined as the number of accumulated hours that the plant has experienced below 45 degrees F recorded after October 15, or as specified on the plans. Lift in the morning, or when the weather is cool and humid. Do not lift plants from frozen soils or saturated soils, or when the Plant Moisture Stress (PMS) exceeds minus 20-bars (a more negative value). Immediately

transport lifted plants to the packing shed.

3. Unless written authorization is provided by the Department, machine lift all plants. If requested in writing, the Department may allow hand lifting. Perform the hand lifting operations in such a manner as to minimize root stripping. During the lifting operations and the subsequent handling operations, minimize exposure of the root system to air, wind or sun.
4. Immediately following transport to the packing shed, assess the trees' moisture level. Proved a cool humid environment in the packing shed to protect against plant desiccation. While being handled in the packing shed, always keep the plant material moist. Maintain all plant materials at minus 5-bars Plant Moisture Stress or a less stressful condition. Mist the plants if Plant Moisture Stress exceeds minus 6-bars. Cull all plant stock in the packing shed for conformance to the material specifications. Do not use space heaters directed towards the packing or grading tables. Pack bareroot trees in sealed 3-ply kraft-polyethylene bags, or sealed polyethylene bags inside wax-impregnated cardboard boxes. With prior written approval of the Engineer, other shipping materials may be authorized. Unless indicated on the plans, ship plugs and tublings in sealed polyethylene bags inside supporting boxes. Ship tublings inside propagation cells.
5. Pack and mark the trees in shipping containers in such a way as to allow quick and easy identification of the materials. Clearly label each container with grower, species, quantity, chilling hours, lift date, packing date, cold storage date, recommended maximum storage time and any chemical treatment for field conditions, such as Furadan or Benlate. If more than one bag is packed in a shipping container, mark each bag with quantity and species. For each species, uniform packing quantities are desirable.
6. Except when specified and according to best forestry practices, plants may be placed into cold storage at the nursery prior to shipment. Unless directed in writing by the Engineer, do not place species or regional populations that are poorly adapted to placement in cold storage in a cold storage facility. Ensure that any plants placed in the cold storage are suitable for cold storage. When required for proper plant handling and outplanting survivalship or when specified, lift species at the nursery, process and ship within a 2-day period.
7. Operate and maintain cold storage facilities according to best forestry practices—temperature range 34-36 degrees F, as measured inside the shipping containers, with a minimum relative humidity of 90 percent and good ventilation. A temperature of 34 degrees F with a relative humidity of 95 percent is desired. Do not place plant material in freezing

temperatures. It is critical that the temperature of the stock as measured inside the packaging does not exceed 36 degrees F. Improper operation or maintenance of the cold storage facility may result in the rejection of the planting material, as solely determined by the Department. Do not ship or accept plants lifted prematurely, based on the proposed planting dates and the number of chilling hours accumulated, as solely determined by the Department. It is the sole responsibility of the Contractor to inform the nursery of this provision of the specifications.

I. Stock Transit:

1. All plant transit procedures, packing methods and use of materials are subject to approval by the Engineer. If plugs are specified, perform shipping and container handling of the plugs in such a manner as to limit soil loss from around the root systems to the maximum practical extent, as determined solely by the Department. Unless specified on the plans or approved in writing by the Department, open-bundled packing or shipping is not allowed. If open-bundled material is authorized by the Department, handle the material according to best forestry practices and, in this case, the Department will require the preparation of additional handling, shipping, and watering guidelines.
2. Unless directed by the Department, ship containers on strapped steel or wooden pallets. Number and mark each pallet for easy identification. A shipping slip indicating species and quantities for each pallet and total quantities must accompany each shipment. Perform the packing of the pallets to promote good ventilation around each of the individual shipping containers. Unless supported by spacers, racks, or platforms, limit stacking of shipping containers to 2 containers high per pallet. While in transit, pack and protect plant materials according to best forestry practices and in such a way as to prevent the drying, heating, bruising or possible desiccation of the plant tissues.
3. Unless supported by spacers, racks, or platforms, limit stacking of shipping pallets for bareroot stock to 2 pallets high and limit stacking of containerized stock to 1 pallet high. Place and stack pallets to ensure that containers are secure in their shipping positions and to maintain good air circulation around all sides of the pallets and good ventilation throughout the storage area, as solely determined by the Engineer.
4. During transit, keep the material from freezing and keep it covered, cool, moist, well-ventilated, and out of the wind and sun.

5. Conduct transport of all stock in refrigerated trucks with proper ventilation. Insulate the beds of the trucks from the exhaust system. During transit, the refrigeration unit must be operational at all times. Within the shipping compartment, maintain the temperature around the stock between 34-36 degrees F. A temperature of 34 degrees F with a minimum relative humidity of 95 percent is desired. The product temperature of the stock as measured inside the packaging may not exceed 36 degrees F. Unless taken directly to the project site, deliver the plant material to a cold storage facility in Delaware. The Delaware-based cold storage facility is subject to approval by the Department.
6. If shipped directly from the nursery to the project site, operate the refrigeration unit and the ventilation system at all times with on-site parking of the vehicle limited to 58-hours. Keep this refrigerated compartment closed to the maximum practicable extent. Unless directed by the Engineer, plant all materials prior to the departure of the refrigeration truck.
7. The Delaware-based cold storage facility shall be operated and maintained according to best forestry practices - temperature range 34-36 degrees F, as measured inside the shipping containers, with a minimum relative humidity of 90 percent and good ventilation. A temperature of 34 degrees F with a relative humidity of 95 percent is desired. Do not place plant material in freezing temperatures. It is critical that the stock temperature not exceed 36 degrees F. All lower-course stacking shall occur on raised pallets. Unless supported by spacers or racks, stacking of shipping containers is limited to 2 containers high. All stockpiling and stacking shall be done in such a manner as to maintain good air circulation around all sides of the pallets and good ventilation throughout the storage area, as solely determined by the Engineer. At the direction of the Engineer, the cold storage facility will be repacked according to best forestry practices without any additional compensation to the Contractor. Improper operation, stacking or maintenance of the cold storage facility may result in the rejection of the planting material, as solely determined by the Department.
8. Monitor the temperature and humidity levels within the cold storage facility twice daily and forward this information to the Engineer on a weekly basis. If the temperature or humidity levels are outside the specified guidelines, forward the information daily. Include in each monitoring at least one air temperature measurement and three separate readings of plant stock temperatures, as measured inside widely spaced shipping containers with probe soil thermometers. Place the probe soil thermometers in such a manner as not to promote

desiccation of the plant materials. Tightly seal thermometer entrance/exit holes both at the time of thermometer placement and removal.

**Submittals:**

A. Within 30-days of the award of the contract, forward in writing a complete listing of the proposed planting materials and the genetic origins of the materials to the following address:

Engineer, Locations & Environmental Studies Office

Department of Transportation

P.O. Box 778

Dover, Delaware 19903

The Department will review these submitted materials. If deficient, as solely determined by the Department, forward additional information as requested. Any problems with obtaining any of the specified plant materials should be forwarded in writing to the Engineer, Locations & Environmental Studies Office. Discuss the cause of the acquisition problem(s) in full and include a list of vendors contacted. More than one vendor may be required to obtain all the necessary plant materials. Suggestions concerning appropriate substitutions may be included with this correspondence; however, only the Department may approve such substitutions.

B. Plant Inspection Reports:
   1. Provide all certificates of inspection of plant materials that may be required by federal, state, or other authorities to accompany shipments of plants.
   2. Provide complete information as to the location of all plants which are intended to be supplied and used. The Department reserves the right to inspect, tag (seal) and approve all plants at the source of supply. This inspection and tagging shall not in any way eliminate the

right of rejection at the Delaware based cold storage facility or the site including the presence of heated materials, dried trees, dried roots or growing media, excessive mold, discolored tops, dormancy release or damaged packaging and shipping materials. Any materials not conforming to these specifications may be rejected by the Engineer without compensation to the Contractor. Remove any material rejected from the work site by the end of each working day.

C. Within 60-days of the award of the contract, forward confirmed purchase orders for all specified plant materials to the above address. Initiate the propagation of the source material only after receiving written approval of the genetic origin of the source material by the Department.

D. Any proposed variance from the plant propagation guidelines must be approved in writing by the Department prior to initiating the change(s). Upon request by the Department, supply a complete methodology concerning the proposed or completed collection and propagation methods including dates of collection, collection sites, method of collection, growth media, cell sizes, rooting treatments, rooting success statistics, propagation methods including pruning, fertilizer treatments and recommendations concerning future propagation methods. Inform the plant material suppliers of these requirement prior to obtaining any purchase order agreements.

E. A minimum of 60-days prior to the initiation of the planting operations, supply the Engineer with a map indicating the location of each of the proposed field stockpiling sites (field caches). The Engineer will provide the base map. Develop the number and locations of the field stockpiling sites in such a manner as to promote an efficient planting operation. This field stockpiling site plan shall be subject to approval by the Department. Whenever directed by the Department or Engineer, construct additional stockpiling areas at the locations approved by the Engineer.

F. If the Contractor possesses a record of successful forest plantings that have received final approval by the U.S. Army Corps of Engineers, U.S. Forest Service or a state Forest Service, comments concerning the appropriateness of the various plantings, composition of the planting blocks, planting techniques and anti-herbivory measures are welcomed and encouraged. Submit

these comments and suggestions to the Department within 30-days of the award of the Contract. The Department may elect to reject some or all comments.

**Construction.**

A. General:

1. All work and materials are subject to direction and approval by the Department. For this work, the Department may contract a Professional Forester to augment the staff of the Engineer and to supervise the actual planting operations, including the inspection and acceptance of the materials and the planting. When designated by the Department, this individual will serve as the Department's project representative as it relates to this specification. This individual has the authority of the Engineer. The work of the Professional Forester is subject to approval by the Engineer.
2. A key responsibility of the Contractor is proper tending of the planting stock throughout all phases of the reforestation program. During all work, including plant transport, off-site or on-site storage and on-site plant handling. Handle the plant material carefully to prevent injuries and desiccation. Keep the plants covered, moist, cool, out of the wind and sun, and from freezing. During all phases of this work, handle all shipping bags, shipping boxes and plants gently, according to best forestry practices as solely determined by the Engineer.

B. Planting Method and Tools:

1. Use the planting method specified on the plans. At the written direction of the Department, an alternative method may be substituted and may include the use of various planting tools (including shovels), power augers to develop the planting holes, specialized planting tools or mechanized planting tools. If the Contractor wishes to use different planting tools, the Engineer may require the Contractor to submit a planting methodology for prior approval. If power augers are utilized, they must possess tapered bits specifically designed for reforestation work. When power augers are utilized, the Engineer may require the use of deglazing tools to promote root growth. If power augers are authorized for use, always have on site at least the minimum number of hand tools necessary to hand plant the stock while fully utilizing all members of the planting crew.

C. Planting Window:

1. Begin planting as soon after March 1 as weather and ground conditions permit, as solely determined by the Engineer. Within 5-days of the starting date, have at least one planting crew and one crew boss on site ready to commence planting. Unless directed by the Department, complete all planting by April 15. If specified on the plans, containerized stock may be planted from October 1 to March 1 provided the soil is not frozen or air temperatures are not freezing.

D. Planting Conditions:

1. Trees cannot be planted in frozen ground or during periods of freezing air temperatures. The Department may stop planting due to weather or any other conditions that are not favorable to tree planting. Unsatisfactory planting conditions include, but are not restricted to, temperatures above 60 degrees F, relative humidity below 40 percent, wind speed greater than 10-miles/hour, or available soil moisture less than 50 percent. Planting may also be postponed if ground freezing temperatures are forecasted for several days immediately following the planting. If directed by the Engineer, immediately return all planting materials to the cold storage facility or place them in a refrigerated vehicle.

E. Vehicular Traffic:

1. Vehicular traffic is subject to restrictions as specified on the plans or as directed by the Engineer. On a bedded or ripped site, perform the movement of vehicles in such a manner as to limit damage to the beds or rips.

F. Planting Sequence:

1. Follow the planting sequence as shown on the plans or as directed by the Engineer.

G. Planting Crew Personnel Requirements:

1. Unless specified on the plans or approved by the Department in writing, each planting crew will consist of a minimum of between 12 and 20 planters, and 1 crew supervisor (crew boss).
2. Unless specified on the plans or approved by the Department in writing, provide at least one

qualified crew for the duration of planting. Switching to new crews or replacing one crew with another will not be permitted, unless special advanced permission is given by the Department.

3. Fully and properly clothed planting crew members are required. Ensure that the planting crews have the proper work shoes. Depending on site conditions, rubberized waterproof boots with heavy soles may be required by the Department.
4. Unless directed in writing by the Department, warming fires are prohibited. If warming fires are allowed, these fires cannot occur within 100-feet of areas where seedlings are being handled.
5. If directed by the Engineer, crew members performing unsatisfactory work shall cease all planting. These individuals may engage in other work activities, but not the actual planting. Replace dismissed planting crew members with new qualified workers within 2 working days.

H. Seedling/Sapling Care, Handling, Root Pruning and Culling:

1. At the time of on-site delivery, stock soil temperature shall be above 32 degrees F and shall not exceed 39 degrees F. Capped trucks or trailers with good means of ventilation are required for all transport vehicles. Do not use open-bed vehicles. Unless freezing temperatures exist and unless directed by the Engineer, do not heat the transport compartment. Maintain at least 12-inches of air space between the top of the shipping containers and vehicle cover when packing the plants. Then cover the containers with secured thermal reflective tarps (WHITE SIDE UP) and nothing else may be placed on top of the shipping containers. If any shipping container is damaged, immediately tape the damaged opening and inform the Engineer.
2. Each morning, arrange for sufficient stock to be transported from the cold storage facility to the site for that morning's plantings. Later in the day, arrange for additional shipments from the cold storage facility sufficient to complete the afternoon's planting. With the written approval of the Department, the Contractor may transport sufficient stock in the morning to serve the whole day's planting needs. However, the Engineer may reject or withdraw approval of such a request. At no time may the number of plants at the site exceed that day's planting allowance for that site. At the end of the workday and without exception, immediately return

all planting materials not installed to the cold storage facility, utilizing the same handling procedures.

3. At the work site, park the transport vehicles in a shaded location away from the wind. Then off-load and stockpile the shipping containers shall then be off-loaded in a location free of standing water as previously approved by the Engineer. Ideally, this location should provide natural shade and protection from wind. Prior to stockpiling, place spacer boards on the ground to support the stockpiling. These spacer boards may be 2 by 4-inch lumber, 3-inch diameter PVC pipe, or another material as approved by the Engineer. Shade the entire stockpiling area or field cache with light colored tarp whose boundaries extend a minimum of three feet beyond the limits of the spacer boards on all sides. Then place thermal reflective tarps (WHITE SIDE UP) over the stockpiled materials in a manner ensuring that the top and all sides of the shipping containers are covered by the tarps.
4. If wind speeds exceed 15-miles/hour, erect a wind barrier adjacent to the stockpiling area. With the approval of the Department, the Contractor may elect to utilize the transport vehicle as a temporary storage area, subject to the above restrictions and guidelines, including the placement of reflective thermal tarps.
5. Always handle shipping containers gently. Place shipping containers in the correct stockpiling positions and not thrown to the ground, into a stockpiling area, or between workers. Open shipping containers by cutting the binding strap, pulling the binding tab or another approved method, as determined by the Engineer. Opening the shipping container with a planting tool, a knife puncturing the shipping container, or any other method not specifically approved by the Engineer is prohibited.
6. Transfer of plants from the shipping container to the planting bags or tubling carriers in the shade provided by the stockpiling areas and out of the wind to the maximum extent practicable. Except when actively transferring planting materials from the shipping container to the planting bag or tubling carrier, the shipping container shall remain tightly closed and always out of direct sunlight, supported by spacer boards and shaded with a thermal reflective tarp (WHITE SIDE UP). Unless all stock will be immediately transferred to planting bags, only one shipping container of a single species may be opened at any field stockpiling site during planting operations.

7. With bare root stock, remove only one handful of seedlings at a time from the shipping bag/box. Separate and carefully untangle this handful and immediately place it in the planting bag. Separate and untangle only enough seedlings to fill the planting bag gently to the desired volume or as directed by the Engineer. Do not separate and untangle an entire container or an advance quantity of trees. If plug stock is specified, with the permission of the Engineer, the polyethylene shipping bags may be placed directly into the planting bag. Following transfer to the planting bag, immediately close the shipping container and placed it under the protective thermal reflective tarp. Except when actively planting or opening a shipping container, shade and cover all stock with thermal reflective tarps.
8. Do not overpack the planting bags or tubling carriers. Limit the number of trees that can be placed into the planting bag to the number that can be planted in a 2-hour period. At any time, the Engineer may limit the number of trees that can be placed into the planting bag to a one hour planting supply. The placement or removal of trees from the planting bag or tubling carrier cannot result in bruised, torn or otherwise damaged trees.
9. Unless written permission is granted by the Department, tubling stock may not be extracted from the cell at the stockpile areas. Extract the tublings shall from the cell only as part of the actual planting procedure.
10. Plans will typically specify that the plantings occur as mixes of several species and not as monocultures of a single species. When mixes of species are specified, pack the planting bags in the approximate ratios required to naturalize/randomize the plantings as specified on the plans or as directed by the Engineer. Ensure that the plantings are naturalized/randomized as specified on the plans.
11. Plant trees in the areas designated on the plans. If an area is planted in monoculture or an inappropriate mix, as determined by the Engineer, at the direction of the Engineer remove the planting or a segment of the planting and discard the plants. The area will then be replanted as specified.
12. Unless specifically directed by the Engineer, no pruning, pulling or pinching of the taproot or lateral roots may occur in the field.
13. Perform field culling of seedlings to the specifications of the Engineer. If frozen trees are found, immediately inform the Engineer. Do not plant these frozen trees.
14. Unless directed by the Engineer, do not water clay-coated or gel-coated bare root stock or add water to the bare root shipping containers containing coated stock. Water tubling stock and

plug stock as necessary to maintain moist soils and root systems. If dipped in water, do not place the stock in the water for more than one minute. Provide a gentle watering that does not result in the removal of soil from the stock. Water is not allowed to puddle in the shipping containers, as excess water can drown root tips and promote mold on the trees.

15. Keep trees in planting bags moist at all times. If directed by the Engineer, line tree planting bags with moist burlap cloth. Because clay-treated trees have been specified, the bare root trees cannot be carried in moss-lined planting bags or in bags holding a water slurry.
16. Shade moves with time. Ensure that, once materials are stockpiled in the field stockpiling sites, the plant materials remain shaded as the day progresses.
17. Do not allow the trees to be exposed outside the shipping container or planting bag for more than 2-minutes. At the direction of the Engineer, this exposure time may be reduced to 1-minute.
18. Protect the trees from damage. Do not crush, stand, or sit on any tree or shipping container. Do not abuse the seedlings/saplings by hitting the roots or striking the roots across an object to remove excess soil. The clay emulsion or attached soil which covers the roots may not, at any time, be beaten, removed, rinsed, caused to flake off, or otherwise damaged. Do not tear the roots while handling or planting the trees.
19. When planting with an OST bar, KBC bar, cylindrical dibble, plug extractor or power auger, remove only one seedling at a time from the planting bag to avoid root drying and physical damage caused by contact with the handle of the planting bar. Remove the tree from the planting bag only after the planting hole or slit has been made in the ground.
20. When planting with a hoedad, planters should not carry more than 3-trees in their hands at one time. The Engineer may specify the maximum number of trees which can be carried, based on weather conditions and work practices. At any time, the Engineer may specify that only one tree can be carried in hand.
21. Once the trees have been removed from the shipping containers, plant the trees immediately. Once placed in the planting bag, trees shall not be subsequently replaced back into the shipping containers. Prolonged or unnecessary exposure of trees while in planting bags is not allowed. Do not use planting bags for tree transport or for temporary storage. When not in active use, including break periods, keep the empty planting bags shaded.

22. Do not use planting tools to maneuver the tree or roots into any planting hole. Provide planting holes large enough to allow easy placement of the tree at the appropriate depth without tangling, catching or forcing upward the orientation of the root system.
23. Do not leave wax-impregnated boxes, tubes, tube racks, plant trays, shipping materials, or crew debris on-site. Dispose of these materials in an appropriate manner.
24. Maintain a sufficient supply of freshwater on site for any water needs during the planting operation.

I. Planting Spot:

1. At the proper spacing, pick a location free of debris (duff, leaves, wood, litter, grass, trash, etc.). On a bedded site, provide planting locations on the raised bed in the highest topographic positions. On a ripped site, provide planting locations in the base of the rip furrow. If no acceptable spot free of debris is available, clean the debris off a planting spot to expose the mineral soil by raking the debris away with the foot, planting tool, or other means acceptable to the Engineer. Do not place plants in standing water. Planting in a waterlogged location is likely to result in J-rooting. Planting without proper removal of the debris is likely to lead to J-rooting or unwanted air pockets that will cause the roots to desiccate.

J. Planting—OST Bar (Dibble Bar) and KBC Bar:

1. Insert the entire usable blade of a planting bar straight down into the soil near the center of the planting spot and open the planting hole by firmly pulling back the bar handle (the planting bar shall be used so the blade is parallel to the planter's front side). Where soil conditions permit, no rocking of the planting bar shall occur. Where the soil is tight and the hole does not open cleanly, rock the handle back and forth until a clean hole is formed. However, excessive rocking of the bar during its insertion can result in an “hourglass hole,” which will be difficult to plant or close properly because of the creation of a constriction point below which a large air pocket can form. “Hourglass hole” plantings will not be accepted. Excessive rocking can also cause the soil in the planting hole to be compacted. The hole needs to be large enough so that the tree roots can be placed in a nearly natural position and deep enough to accept the entire root structure without the development of J-rooting, L-rooting or binding of the roots during the planting operation.

2. Remove the planting bar from the planting hole. Remove a tree from the planting bag and immediately place the tree into the planting hole. The tree roots should be gently placed into the planting hole so that the root collar of the seedling is one or two inches below the desired planting depth, but not far enough to damage the tree roots. The tree should then be pulled gently upward until the desired planting depth is reached, as shown in the details. The tree should be shaken slightly to loosen and spread the roots. Install the tree roots in a nearly natural position, orientated downward and outward. Place the root collar so that the collar is 1-inch below the groundline at the planting spot.

3. Secure the tree in place at the proper planting depth with soil. This is done by inserting the planting bar about 2-inches behind the tree and parallel to the planting hole. Push the blade about halfway straight down. While holding the tree at the proper depth with the hand, push the handle of the planting bar forward, causing soil to move forward, thereby closing the planting slit and holding the tree temporarily in place.

4. Push the planting bar down to the full length of the usable blade. To close the bottom of the planting hole, pull back firmly on the bar handles. This packs the soil against the tree roots at the bottom of the planting hole, tightens the soil around the bottom of the roots, and prevents air pockets. Next, push the bar handle forward to pack the soil firmly against the entire portion of tree in the ground and to prevent any air pockets from forming around the roots. If necessary to remove the bar from the ground leaving a clean closing hole, the bar may be rocked back and forth prior to withdrawal.

5. Move back away from the tree about 2-inches more and insert the planting bar into the soil the full length of the usable blade. Twist the planting bar to loosen soil, then firmly push forward and then back on the bar, filling the previous hole. Fill this closing hole by firming (stamping) with the heel and toe or by other methods approved by the Engineer. Then apply firm foot pressure immediately adjacent to the tree. This is done to compact the soil, ensure proper planting, and eliminate air pockets. Apply firm foot pressure in several different positions immediately adjacent to the tree. If directed by the Engineer, the placement of firm foot pressure can occur while maintaining a gentle hold of the tree, thus promoting vertical

placement of the tree. Do not step on, bruise, or walk through the tree, or cause the tree to lean. Check for tightness by pulling gently on the tip of the tree.

K. Planting—Hoedad Tool:

1. Strike the planting spot with the blade almost vertically, full depth of blade into the soil. Pull up on the handle to break the soil loose at the bottom of the hole. Avoid raising the handle more than a few inches; otherwise, the hole will fill with soil and the tree will be shallow-rooted and unacceptable.
2. Slide one hand down the handle almost to the blade. Pull back on the handle to form a pocket on the far side of the blade. With the other hand, immediately place the tree roots into the pocket to the full depth of the hole. The tree roots should be placed gently into the planting hole so that the root collar of the seedling is one or two inches below the desired planting depth, but not far enough to damage the tree roots. The tree should then be pulled gently upward until the desired planting depth is reached, as shown in the details. The tree should be shaken slightly to loosen and spread the roots. Install the tree roots in a nearly natural position, orientated downward and outward. Place the root collar so that the collar is 1-inch below the groundline at the planting spot.
3. Hold the tree in place while sliding the hoedad blade out of the hole. Loose soil should fall into the pocket, holding the tree in place.
4. Pull the blade completely out of the hole and push soil against the planted tree with the tip of the blade.
5. Next, apply firm foot pressure immediately adjacent to the tree. This is done to compact the soil, ensure proper planting, and eliminate air pockets. Apply firm foot pressure in several different positions immediately adjacent to the seedling/sapling. If directed by the Engineer, the placement of firm foot pressure may occur while maintaining a gentle hold of the tree, thus promoting vertical placement of the tree.

Do not step on, bruise, or walk through the tree, or cause the tree to lean. Check for tightness by pulling gently on the tip of the tree.

L. Planting Cylindrical Dibble or Plug Extractor:

1. Locate the planting tool in the center of the planting spot, orientate the tool vertically (straight down) and apply firm pressure on the footstep so that the planting tool penetrates to the full design depth. Create a hole within 10 degrees of vertical.
2. Remove the planting tool and examine the planting hole. Create a planting hole that is clean and conforms to the shape of the dibble head or desired plug dimensions. If the planting hole does not conform to the required shape because of sloughing soil, the tool may be inserted again. If the planting hole still does not conform to the shape of the desired dimensions, abandon the hole shall be and select a new planting spot. If the planting hole results in a large air pocket that cannot be easily closed with foot pressure, abandon the hole and select a new planting spot. If the planting hole is satisfactory, gently remove a tubling from the plant tray, plant carrier or shipping container and carefully remove the tree from the plant tube. Alternatively, carefully remove a plug from the planting bag or plant carrier. Immediately place the tree in the planting hole. The tree should be placed in the planting hole so that the top of the tubling or plug rootmass root collar is 1-inch below the adjacent soil elevation. The tree roots should be in a nearly natural position, orientated downward. The desired planting depth is <u>not</u> the depth grown in the nursery, but 1-inch deeper.
3. While placing the tree in the planting hole, do not force it into the planting hole. Do not compress, twist, screw or balled-up the root system.
4. With the foot, scrape enough soil from the surrounding area to close the planting hole fully, thus covering the soil surface of the tubling or plug to an elevation that is slightly higher than the adjacent soils, as shown on the details. A poorly closed planting hole or the exposure of the soil surface of the tubling or plug will promote desiccation of the tree and the wicking of soil moisture.
5. After the tree is placed at the appropriate depth and the soil surface of the tubling or plug is covered with soil, apply firm foot pressure immediately adjacent to the tree. This is done to firm the soil, ensure proper planting, and eliminate air pockets. Apply firm foot pressure in several different positions immediately adjacent to the tree. If directed by the Engineer, the placement of firm foot pressure may occur while maintaining a gentle hold of the tree, thus promoting vertical placement of the tree. Place the tree such that the top of the rootmass is 1-inch below the soil surface with the planting hole being totally closed with firmed soil and without the presence of air pockets adjacent to or underneath the tree. Do not step on, bruise, or walk through the tree, or cause the tree to lean. Check for tightness by pulling gently on the tip of the tree.

M. Tree Shelters:

1. When specified on the plans, install tree shelters at the designated density. Provide the type of tree shelter as shown on the plans or an approved equivalent. Perform all work so as not to injure the trees or shrubs, bruise or cut the bark, or remove leaves or branches. Following installation of the tree shelters, the branches should be in an upright position and not pointing downward or toward the ground.
2. Install the tree shelter as shown on the plans or per the manufacturer's instructions. If stake dimensions shown on the plans are larger than the manufacturer's recommendation, use the stake dimensions shown on the plans. Reinstall any improperly installed shelters as directed by the Engineer. Defective shelters, shelters damaged or weakened during transport or installation will not be accepted.

N. Plant Acceptance is Subject to the Following Requirements:

1. Trees must be planted in a hole large enough to accommodate the root system in a natural position.
2. The hole must be made in mineral soil that is free from duff, litter or trash. Holes may not be made in root piles.
3. Planted trees must be at the depths specified. Details show illustrations of unacceptable and acceptable plantings.
4. Trees shall not be damaged by the planting process.
5. The main taproot must be planted straight without “U” roots, “J” roots or “L” roots to the maximum extent practicable.
6. Lateral roots cannot be twisted, screwed or balled-up.
7. Trees must stand upright with no more than 20 degrees of lean.
8. The hole must be filled in both at the bottom and at the top and packed firmly without injuring the bark of the tree.
9. Trees must be planted at the prescribed spacing to give the desired stocking and in the locations shown on the plans.
10. Trees must be planted so that they are visibly tight, are not loose in the ground, and can withstand being pulled from the ground by the terminal bud.
11. If the installation tree shelters has been specified in the plans, final acceptance of the planting cannot occur until acceptance of the tree shelters.
12. All work is subject to approval by the Engineer. The Engineer will notify the Contractor of any noncompliance with the foregoing requirements. After receipt of such notice, immediately take corrective action. Such notice, when delivered to the Contractor or the Contractor's representative at the site of work, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses

to comply promptly, the Engineer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders can be made the subject of a claim for extension of time or excess cost or damages to the Contractor.

O. Plant Establishment Period:
   1. There is no plant establishment period for Reforestation.

**Method of Measurement:**

A. The Department will measure Reforestation as the number of plants satisfactorily installed and accepted. The quantity will be established based on totaling the individual packing slip quantities that must be presented to the Engineer upon delivery of the plants.

B. Deductions from the packing slip quantity will be made for plants that are:
   1. Supplied from an unapproved source;
   2. not approved in the field due to improper size, quality, storage, or installation; and/or
   3. not approved due to violation of any other portion of this Specification.

**Basis of Payment:**

A. The Department will pay for Reforestation at the contract unit price per each. Price and payment constitute full compensation for:
   1. Inspecting and accepting plants at the nursery prior to transporting;
   2. providing, transporting, storing, and installing all materials;
   3. providing cold storage space, tree shelters, and water;
   4. disposal of excess material;
   5. providing and utilizing all specialty tools and equipment;
   6. providing all specified submittals; and
   7. all incidentals required to complete the Work.

B. The Department will not pay for:
   1. Material or the cost of installation for plant species that are not specified;
   2. materials not packed according to best forestry practices;

3. construction of stockpiling sites requested by the Contractor and approved by the Department;
4. discarded plants, the cost of the installation of the discarded plants, or the cost of the removal of the discarded plants;
5. plants that become frozen for any reason; and/or
6. reinstallation of any improperly installed tree shelters

10/22/2024

# 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

SHANTÉ A. HASTINGS
SECRETARY

**UTILITY STATEMENT**
**AUGUST 21, 2024**
***REVISED*: NOVEMBER 5, 2025**
**STATE CONTRACT NO.: T202104204**
**P6 NO.: 20-63915 F.A.P. NO.: N/A**
**HEP KC, SR15/KENTON RD. AT CENTRAL CHURCH RD. INTERSECTION IMPROVEMENTS**
**KENT COUNTY**

The following utility companies may own and/or maintain facilities within the project limits:

**Comcast Cable Communications**
**Delaware Electric Cooperative**
**Tidewater Utilities**
**Verizon Delaware, LLC – Communications**

The following is a breakdown of the Utilities involved, adjustments and/or relocations as required:

**Comcast Cable Communications:**
**Comcast Cable Communications maintains the following communications facilities within the project limits:**

1. Aerial Cables located at Utility Pole DEC 83472 and heads northwest along the west side of Kenton Road to Utility Poles DEC 83469, DEC 83468 and DEC 83397. The Aerial Cables then heads southwest along the east side of Central Church Road to Utility Poles DEC 83388/JS3 81 27 R1 and DEC 83381 JS3 25.
2. Aerial Cables located at Utility Pole DEC 83385 JS3 81 26 and heads northeast along the west side of Central Church Road to Utility Pole DEC 83391 JS3 81 29.
3. Aerial Cables located at Utility Pole DEC 83461 and heads northeast along the west side of Central Church Road to Utility Pole DEC 83535.

**Anticipated Comcast Aerial Relocations:**

1. Aerial cables along the west side of Kenton Road from pole DEC 1433909 at station 109+93 to pole DEC 83400 at station 204+32 will be relocated to new Power Company Poles.

2. Aerial cables along the west side of Central Church Road from pole DEC 8391 at station 305+50 to pole DEC 83530 at station 405+04 will be relocated to new Power Company Poles.

**Delaware Electric Cooperative (Electric):**

**Delaware Electric Cooperative maintains the following overhead electric facilities within the project limits:**

1. Line begins near station 163+50 (pole DEC 83475) and heads northwest along the west side of Kenton Road.
2. Line begins near station 171+50 (pole DEC 83397) and is connected to a junction well.
3. Line begins near station 302+50 (pole DEC 83461) and is for residential connections.
4. Line begins near station 305+00 (pole DEC 83530) and is for residential connections.
5. Lines begins near station 308+00 (pole DEC 83535) and are for residential connections.
6. Line begins near station 307+50 (pole DEC 83536) and is for residential connections.
7. Line begins near station 207+50 (pole DEC 83391 JS3 81 29 and is for residential connections.
8. Line begins near station 205+75 (pole DEC 83393) and is for residential connections.
9. Lines begin near station 203+50 (pole DEC 83388 JS3 81 27R1) and are for residential connections.
10. Line begins near station 201+50 (pole DEC 83385 JS3 81 26) and is for residential connections.
11. Lines begins near station 201+00 (pole DEC S38125) and are for residential connections.
12. Line begins near station 200+50 (pole DEC 83381 JS3 81 25) and is for residential connections.
13. Multiple residential connections as shown on the plans.

**Delaware Electric Cooperative proposes the following relocations within the project limits:**

1. Install a new pole on the east side of Kenton Road at station 108+69 and remove pole DEC 83467.
2. Install a new pole line along the west side of Kenton Road beginning at station 109+93 (connects to pole DEC 1433909) and continuing north to station 204+32 (connects to pole DEC 83400).
3. Remove poles DEC 83398, DEC 83397, and DEC 143908 along the west side of Kenton Road.
4. Remove pole DEC 247191 and DEC 83399 along the east side of Kenton Road.
5. Install a new pole line along the west side of Central Church Road beginning at station 305+50 (connects to pole DEC 8391) and continuing northeast to station 405+04 (connects to pole DEC 83530).
6. Remove pole DEC 83394 JS3 81 29 and pole DEC 83461 along the west side of Central Church Road.
7. Proposed DelDOT service connection is required at the following location – station 201+00 LT (lighting).

**Tidewater Utilities:**

**Tidewater Utilities maintains the following water facilities within the project limits:**

1. 12" PVC water main begins prior to the project limits at station 102+00, continuing northwest along the west side of Kenton Road to outside the project limits at station 206+50. The 12" PVC water main travels from a valve box at station 309+88 in the southwest direction, initially along the centerline of Central Church Road, then veering to the west side of the road, eventually ending beyond the project limits at station 300+00.
2. The water main is encased under the intersection and capped off at the North side of Kenton Road.
3. Existing water valves are near stations 309+88 on Central Church Road and 200+85 on Kenton Road.
4. Existing fire hydrants with water valves are near stations 110+75 and 205+35 on Kenton Road.

**Tidewater Utilities proposes the following relocations as part of this contract:**

1. Install a new 12" PVC water line tying into the existing 12" PVC water main beginning at station 304+50 along the west side of Central Church Road. Line heads northeast along the west side of Central Church Road to station 308+88.
2. Install fire hydrant at station 308+00 on the west side of Central Church Road.
3. Install (1) 12" gate valves at station 308+88 on the west side of Central Church Road as shown on the plans.
4. Install a new 12" PVC water line from station 308+88, beginning with 2" temporary blow-off, along the west side of Central Church Road to station 200+84 on Kenton Road tying into previous constructed stub.
5. Install a new Schedule 40 Steel Casing and 12" PVC water line crossing Central Church Road at station 308+88. Steel Casing must extend a minimum of 5' beyond edge of pavement on Central Church Road.
6. Install a new 12" PVC water line beginning at station 308+88, with water valve, along the east side of Central Church Road. Line heads northeast along the east side of Central Church Road to station 110+90 on the west side of Kenton Road tying into the existing 12" PVC water main. Install 2" temporary blow-off at this location.
7. Abandon existing 12" PVC water main beginning at station 304+50 along the west side of Central Church Road heading northeast to stations 110+90 and 200+84 along the west side of Kenton Road. Valve boxes on abandoned line are to be removed. Fire hydrant at station 110+75 to be removed.
8. Install new fire hydrant, connected to the existing 12" PVC water main, at station 109+30 along the west side of Kenton Road.

**Verizon Delaware, LLC:**

**Verizon of Delaware Inc. maintains the following aerial facilities within the project limits:**

1. Verizon maintains aerial facilities along the West side of Kenton Road from DEC Pole # 83475 at station 103+41 L30 (UT-01) extending North beyond the project limits.
2. Verizon maintains aerial facilities along the North side of Central Church Road from DEC Pole #83397 at station 309+76 L05 (UT-02) extending West beyond project limits (UT-04).

**Verizon of Delaware Inc. maintains the following buried/underground facilities within the project limits:**

1. Verizon maintains buried facilities along the East side of Kenton Road beginning prior to project limits at station 102+00 R14 (UT-01) extending North to VZ Pedestal at station 106+79 R24 (UT-01).
2. Verizon maintains buried facilities along the East side of Kenton Road from VZ Pedestal at station 106+79 R24 (UT-01) extending North to VZ Pedestal at station 108+83 R24 (UT-02) and Remote Terminal at station 108+87 R29 (UT-02).
3. Verizon maintains buried facilities along the East side of Kenton Road from VZ Pedestal at station 108+90 R25 (UT-02) extending North to VZ Pedestal at station 110+32 R16 (UT-02) then continuing East along the South side of Central Church Road to VZ Pedestal at station 402+18 R33 (UT-02).
4. Verizon maintains buried facilities along the South side of Central Church Road from VZ Pedestal at station 402+18 R33 (UT-02) extending East to VZ Pedestal at station 405+29 R28 (UT-05) continuing beyond project limits.
5. Verizon maintains buried facilities along the East side of Kenton Road from VZ Pedestal at station 108+90 R25 (UT-02) extending North to VZ Pedestal at station 200+48 R15 (UT-02) continuing North beyond project limits.
6. Verizon maintains buried facilities along the East side of Kenton Road from VZ Pedestal at station 110+32 R16 (UT-02) extending West across Kenton Road and continuing along the South side of Central Church Road beyond the project limits (UT-02, UT-04).

**Anticipated Verizon Aerial Relocations:**

1. Verizon will relocate aerial cables along the West side of Kenton Road to new relocated Power Company Poles as needed (UT02).
2. Verizon will remove aerial cables along the West side of Kenton Road from station 109+94 L42 extending north to DEC Pole# 83400 and extending West to DEC Pole# 83394 (UT-02, UT-03).
3. Verizon to place guys and anchors as required and shown on UT-02.
4. Verizon will relocate existing Fiber Hub from DEC Pole# 33398 at station 110+46 L58 to proposed Handhole at Station 308+79 L38 Central Church Road (UT-02).
5. Verizon will place service pole on the East side of Kenton Road, unless provided by DEC, at station 201+05 R43 to continue service to customer at 3652 Kenton Road (UT-02).

**Anticipated Verizon Buried/Underground Relocations:**

1. Verizon will place buried cable from proposed Pedestal at station 106+56 R30 (UT-01) abandoning copper cable continuing North along Kenton Road and through Roundabout location. (UT-01, UT-02).
2. Verizon will place buried cable from proposed Handhole at station 109+99 L42 (UT-02) extending North along the West side of Kenton Road and continuing West along Central Church Road to approximate station 308+79 R38 then crossing Central Church Road to a new Handhole at station 308+79 L38 Central Church Rd by new pole location (UT-02).
3. Verizon will place buried cable from existing Pedestal at station 307+59 R32 (UT-02) to Proposed Pedestal West side of Central Church Road at station 306+14 R24 (UT-02, UT-04).

4. Verizon will abandon buried cables between pedestal at station 106+79 R24 (UT-01) to Pedestal at station 108+83 R24 and Pedestal 108+90 R25 (UT-02) to station 206+50 R18 (UT-03).
5. Verizon will abandon buried cable between Pedestal at station 110+37 R43 across Kenton Road to Pedestal Southwest side of Central Church Road at station 307+59 R32 (UT-02) and Pedestal at station 307+59 R32 to Pedestal at station 305+81 R27 (UT-04).
6. Verizon will abandon buried cable between Pedestal at station 110+37 R43 (UT-01) to Pedestal Southeast side of Central Church Road at station 402+19 R33 (UT-02) and Pedestal at station 402+19 R33 to Pedestal at station 405+41 R28 (UT-04).

**Areas of Concern:**
N/A

**Test Hole Requirements:**
N/A

**Work Duration:**
Verizon of Delaware Inc. will complete these changes. These relocations/adjustments areas expected to take approximately **60 calendar days** to complete after the company has been given a minimum of **30 calendar days** advance notice that work shall begin, and the right-of-way and proposed work has been laid out in the field by the State's contractor and required tree trimming and clearing has been performed.

**Utility involvement is not anticipated for the work associated with this project and all existing facilities will remain in place and active throughout the duration of the contract. It is important to note, all contractors must maintain a minimum distance of 10'-0" from all energized electric lines during construction and any permanent facilities must be installed a minimum distance of 10'-0" from all aerial electric lines. Additional clearance may be required from high voltage transmission lines.**

**Should any existing utility facilities identified to be in potential conflict with proposed improvements shown in the contract documents, they shall be test pitted by the State Contractor to verify facility and depths using non-destructive methods. The contractor shall adjust proposed improvements to avoid all existing underground or aerial utility facilities, this includes any private utility facilities. If it is not possible to adjust the improvements, then the State Contractor shall coordinate the potential conflicts with utility companies and provide adequate notice as determined by the utility company prior to performing work.**

**Should any conflicts be encountered as a result of the contractor's means and methods during construction requiring adjustment, outages and/or relocation, the necessary relocation work shall be accomplished by the respective utility company and funded by the State's Contractor as directed by the District Engineer.**

**Any utility conflicts that are not readily discernable shall be coordinated by the State Contractor once the conflict is recognized. The time to complete any relocations/adjustments found to be necessary during construction of the highway project will depend on the nature of the work.**

**Any adjustments and/or relocations of municipally or county owned sewer or water facilities shall be performed by the State's Contractor in accordance with the respective agency's standard specifications as directed by the District Engineer. The State contractor shall coordinate any potential conflicts of municipally or county owned sewer or water facilities with facility owners and provide adequate notice to the municipally municipality or county and to the District Engineer prior to performing work.**

**General Notes**

1. The Contractor's attention is directed to Section 105.9 Utilities within the Project Limits; Miss Utility One-Calls, Delaware Standard Specifications, August 2020. 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 and operating purposes for his equipment and, if necessary, make arrangements directly with the utility companies for field adjustments for adequate clearances.

2. 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 unless the delay is caused by the Contractor's delay in having the site conditions ready for the utility relocation work after the Contractor has provided the advance notice that the site conditions would be ready for the utility relocation work. 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 Contractor 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 Utility Companies obtained from Miss Utility ticket submissions with any questions regarding this work prior to submitting bids and work schedules. Note, Utility Companies do not work on weekends, nights, or legal holidays.

5. As outlined in Chapter 4 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 State's Contractor perform the necessary restoration. Any additional costs incurred as a result will be forwarded to the utility company.

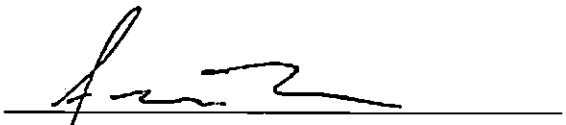
| NAME | COMPANY | PHONE | EMAIL |
|---|---|---|---|
| Mike Sullivan | Comcast Cable Communications | (302) 841-6316 | mike_sullivan2@comcast.com |
| Patricia Wheatley | Delaware Electric Cooperative | (855) 332-9090 ext. 336 | PWheatley@delaware.coop |
| Maximum Morowsky | Tidewater Utilities, Inc. | (302) 734-1321 | mmorowsky@middlesexwater.com |
| George Zang | Verizon Delaware, LLC | (302) 422-1238 | george.w.zang@verizon.com |

7. 16 Del. C. § 7405B requires notification to and mutually agreeable measures from the public utility operating the electric line for 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 minimum distance of 10'-0" from all overhead energized lines. Additional clearance may be required from high voltage transmission lines. Contractors are not permitted to draw water from any hydrant for any use, without the written permission of the Municipality / Water Company having jurisdiction; and proper metering and backflow prevention equipment in place.

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.

9. Contractors are not permitted to draw water from any hydrant for any use, without the written permission of the municipality/water company having jurisdiction and proper metering and backflow prevention equipment in place.

**PREPARED AND RECOMMENDED BY:**



11/5/25

Century Engineering — Date

Andrew Haller, P.E.

ahaller@kleinfelder.com

**APPROVED AS TO FORM BY:**

John Guthrie — 11/5/25

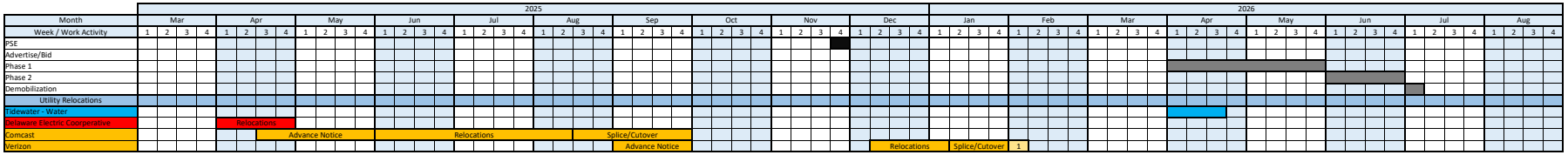
Utilities Section, DelDOT — Date

John Guthrie

John.guthrie@delaware.gov

T202104204 - HEP KC, SR15/Kenton Rd. at Central Church Rd. Intersection Improvements

Utility Bar Chart




NOTES:

1. Verizon to remove existing poles.

**STATE OF DELAWARE**
**DEPARTMENT OF TRANSPORTATION**
**PO BOX 778**
**DOVER, DELAWARE 19903**

# CERTIFICATE OF RIGHT-OF-WAY STATUS

**STATE PROJECT NO. T202104204**

**F.A.P. NO. N/A for R/W**

**HEP KC, SR15/KENTON ROAD AT CENTRAL CHURCH ROAD INTERSECTION IMPROVEMENTS**

**KENT COUNTY**

**Certificate of Right-of-Way Status – 100%**

**Status - 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 necessary real property interests have been acquired in accordance with current FHWA/State directives covering the acquisition of real property; and,

All necessary rights-of-way, including control of access rights when pertinent, have been acquired including legal and physical possession; and,

All project rights of way are currently available in accordance with the project right-of-way plans; and,

**Any residential displaced individuals or families have been relocated to decent, safe and sanitary housing, or adequate replacement housing has been made available in accordance with the provisions of the current Federal Highway Administration (FHWA) directive(s) covering the administration of the Highway Relocation Assistance Program; and,**

All occupants have vacated the lands and improvements; and,

The State has physical possession and the right to remove, salvage, or demolish any improvements acquired as part of this project, and enter on all land.

RIGHT OF WAY SECTION

Monroe C. Hite, III
Chief of Right of Way

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
800 BAY ROAD
P.O. BOX 778
DOVER, DELAWARE 19903

NICOLE MAJESKI
SECRETARY

October 21, 2024

# ENVIRONMENTAL REQUIREMENTS

FOR

State Contract No. T202104204

Federal Aid No.: N/A

Contract Title: **HEP KC, SR15/Kenton Road at Central Church Rd**

PERMIT REQUIREMENTS:

The proposed construction work for this project 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. Written authorization from the permitting agencies is required and paperwork for on-site posting is anticipated. The proposed work for this project will be authorized under the permits listed below:

REQUIRED PERMITS AND APPROVAL STATUS:

- U.S. Army Corps of Engineers (USACE) – Nationwide Permit #14 NAP-2024-00499-103. **Expires March 14, 2026**
- Delaware Department of Natural Resources and Environmental Control (DNREC) Wetlands & Subaqueous Lands Section (WLSL) – Special Exemption (B)
- Delaware Coastal Zone Management (CZM) – Issued
- DNREC Water Quality Certification (WQC) - Issued

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 be the contractor's responsibility to ensure that workers also follow this requirement. 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:

**Construction Restrictions- n/a**

**Cultural Resources**

- The Delaware State Historic Preservation Office concurred with a finding of No Historic Properties Affected in a letter dated January 26, 2023.
- Contractor access beyond the LOC (as identified on the construction plans) without prior approval from FHWA and DelDOT Environmental Studies staff is prohibited. Should it be necessary to add additional access locations or staging/stockpiling areas, or otherwise modify the project scope, methods, or LOC, DelDOT Environmental Studies staff (DOT_EnvironmentalStudies@delaware.gov and John.Mccarthy.2@delaware.gov, (302) 760-4887) must be contacted.

**Protection of Resources**

- Keep clearing in wetland areas to a minimum absolutely necessary for construction access. Support all equipment traversing wetlands and subaqueous land on mats. Payment for mats will be made under item 621500 – temporary timber mat. In wetland areas that are cleared, no grubbing except where necessary to construct project components such as foundations and riprap protection is permitted. Cut vegetation flush with the ground (i.e. No disturbance of the root mat). Restore temporarily disturbed wetland areas to grade and seed with item 908017 - temporary grass seeding (annual ryegrass).
- Use silt fence or construction safety fence along the limits of construction in all areas where water/wetlands are being impacted (as shown on environmental compliance sheets), and also in any area where water/wetlands exist within 20 feet of the limit of construction (as shown on construction plan sheets). Any contractor access beyond the limit of construction is strictly prohibited.
- Use sandbags or compost filter log (CFL) to secure silt fence at areas adjacent to wooded uplands/ all wetlands in lieu of trenching unless proper erosion and sediment control cannot be maintained. Remove sandbags and CFLS (and contents) in their entirety when no longer needed. Sandbags/CFLS used to secure the silt fence is incidental to item 905001 - silt fence. The environmental studies section (302-760-2259 or

dot_environmentalstudies@delaware.gov) can provide further guidance regarding this method of installation.
- Clearly mark all trees to be removed with paint prior to the erosion and sediment control meeting.

**Stream Restoration and Riprap Treatment**

- Follow the special provision for item 707500 – channel bed fill in regards to the salvaging of on-site natural stream bottom material or the furnishing of off- site material. If sufficient sources for channel bed fill do not exist on-site, any new material must conform to the requirements of item 707500 – channel bed fill. Recess all riprap in the channel bottom (i.e. Below the water line) one foot below stream bed elevation and choke with borrow type 'b' so that all of the voids in the riprap are filled with specified material. Payment under item 209002 – borrow, type b. Cover the riprap with a minimum of 12" channel bed fill. Match the final channel elevations with existing elevations at the upstream and downstream project limits. Through the structure, elevations will be as noted on the plans. Payment under item 707500 – channel bed fill.
- Restore other areas of the channel bottom affected by construction (including, but not limited to, the location of sump pits, stabilized outfalls, temporary pipes and/or sandbag dikes and diversions) to existing conditions. Fill any cavities or scour holes resulting from construction activities with channel bed fill. Payment under item 707500 – channel bed fill.
- When all erosion and sediment control measures are removed and the stream returns to its natural flow conditions, the flow must remain above ground and above the riprap (i.e. The flow cannot be "lost" in the riprap or beneath the structure). If this is not achieved, the contractor will be required to take corrective action at the contractor's expense.
- Choke all riprap on the stream bank, outside the channel bed, with delaware #57 stone. Place just enough choke material to prevent the loss of channel bed fill or topsoil (depending on location as indicated below) through the riprap.
    - Beneath the bridge: after placing delaware #57 stone, perform a final choke of channel bed fill so that the riprap peaks are barely visible. Payment under item 707500 – channel bed fill. Delaware #57 stone is incidental to the riprap item.
    - All other locations: finish filling the voids with topsoil so that the riprap peaks are barely visible. Place an additional 6-inch topsoil layer on top of the riprap. Slope seeding will be done with item 908019 – streambank seed mix, seeding. Following the seeding operation, install item 908020 – erosion control blanket (ECB) mulch, or other blanket as shown on the plans. ECB at toe of slope can be either trenched in or stapled at 6" on center. Complete all work, starting with the initial choking with topsoil through the seeding and mulching prior to any rain event. Delaware #57 stone is incidental to the riprap item. All other items will be paid for under their respective items.

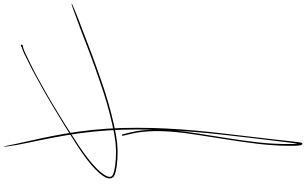
- The topsoil/seed/mulch can be placed before or after the removal of the stream diversion. If the placement occurs after stream diversion removal, use a turbidity curtain to minimize in-stream sedimentation. Payment will be incidental to item 909005 – stream diversion.

**Mitigation**

- This project requires mitigation creation due to the amount of permanent impacts for the project. Should un-permitted impacts occur on the job site, more mitigation will be required, which may not be available at the creation site.
- Mitigation site is to be constructed in one construction season and must be completed before Kenton Rd and Central Church Rd roundabout construction is completed.

The contractor shall pay special attention to specific construction requirements as indicated in the US Army Corps of Engineer Permit as well as the Environmental Compliance (EC) Sheet.

DelDOT Environmental Studies Section 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 at DOT_EnvironmentalStudies@delaware.gov and/or 302-760-2259.



10/21/2024

Van Adams
Natural Resource Supervisor
Environmental Stewardship Office
Delaware Department of Transportation

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
800 BAY ROAD
P.O. BOX 778
DOVER, DELAWARE 19903

NICOLE MAJESKI
SECRETARY

# RAILROAD STATEMENT
**For**

**State Contract No.:** T202104204

**Federal Aid No.:** N/A

**Project Title:** HEP KC, SR15/Kenton Rd. at Central Church Rd. Intersection Improvements

**The following railroad companies maintain facilities within the contract limits:**

- ☐ Amtrak
- ☐ CSX
- ☐ State of Delaware Delmarva Central
- ☐ East Penn
- ☐ Maryland & Delaware
- ☐ Norfolk Southern
- ☐ Wilmington & Western
- ☐ Delmarva Central
- ☑ 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 Coordinator at (302) 659-4664.

☐ Railroad Agreement required. 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 Coordinator at (302) 659-4664.

**Approved As To Form:**

Lei Xu
DelDOT Railroad Program Coordinator

2/7/2024
DATE

# SAMPLE AFFIDAVIT OF CRAFT TRAINING COMPLIANCE

(Actual form for signature will be provided to the awarded contractor)

(PROJECT NAME)
(CONTRACT NUMBER)

## AFFIDAVIT OF CRAFT TRAINING COMPLIANCE

We, the contractor, hereby certify that we and all applicable subcontractors will abide by the contractor and subcontractor craft training requirements outlined below for the duration of the contract. Craft training must be provided by a contractor and/or subcontractor for each craft on a project for which there are Delaware Department of Labor approved and registered training programs or, if the contractor and/or subcontractor meets the requirements under Title 29, Chapter 69, Section 6960A.(b)(1)c.1.-3., payment may be made in accordance with Title 29, Chapter 69, Section 6960A.(b)(1)d. A list of crafts for which there are approved and registered training programs is maintained by the Delaware Department of Labor and can be found at: https://laborfiles.delaware.gov/main/det/apprenticeship/DE%20Craft%20Training%20Occupation%20List%20Effective%20March%201%202022.pdf. If you have questions regarding craft training programs, please submit all questions in writing to the Delaware Department of Labor at: apprenticeship@delaware.gov. ***This Affidavit of Craft Training Compliance must be submitted prior to contract execution***.

In accordance with Title 29, Chapter 69, Section 6960A.(a)(1), a contract relating to a public works project under § 6962 of Title 29 must include a craft training program for each craft in the project if at the time the contractor executes a public works contract, all of the following apply:

a. A project meets the prevailing wage requirement under Section 6960 of Title 29.
b. The contractor employs 10 or more total employees.
c. The project is not a federal highway project, except for the project under Section 6962(c)(11) of Title 29.
d. There is an apprenticeship program for a craft in the project on the list of crafts under Section 204(b)(2) of Title 19.

Pursuant to Title 29, Chapter 69, Section 6960A.(a)(2), ***a contractor must commit that all subcontractors provide craft training*** if paragraph (a)(1) of this section applies to the subcontractor. Failure to provide required craft training or payment on the project may subject the successful contractor and/or subcontractor(s) to penalties as outlined in Title 29, Chapter 69, Section 6960A.(d)(1)-(3).

**Craft(s):** _____

**Contractor Name:** _____

**Contractor Address:** _____

_____

_____

**Contractor Program Registration Number(s)** _____
On this line also indicate whether DE, Other State (identify) or US Registration Number



REVISED 8/10/2022

**Or**

☐ **A payment has been made in the amount established under Section 204(b)(2)b.2. of Title 19, for the craft into the Delaware Department of Labor's Apprenticeship and Training Fund.**

**Or**

☐ **Craft Training requirements are not applicable because:**

_____

**Authorized Representative (typed or printed):** _____

**Authorized Representative (signature):** _____

**Title:** _____

**State of Delaware )**
**) ss:**
**County of _____ )**

Before me, a notary public, in and for said county and state, personally appeared, _____, who acknowledged to me that she/he did execute the foregoing instrument on behalf of _____.

**IN TESTIMONY WHEREOF**, I have subscribed my name and affixed my official seal this ____ day of _____ 20___.

_____
Notary Public

Commission Expires _____



**THIS PAGE MUST BE SIGNED AND NOTARIZED TO BE CONSIDERED.**

**Delaware Department of Transportation**
**Quantity Sheet Summary**

**Proposal ID: T202104204**

**Project Descripton: HEP KC, SR15/Kenton Rd. at Central Church Rd. Intersection Improvements**

**NOT TO BE USED FOR BIDDING**

| Item Number | Description | Unit | Quantity |
|---|---|---|---|
| 207001 | PIPE, CULVERT, AND STRUCTURE BACKFILLING | CY | 581 |
| 207021 | STRUCTURAL BACKFILL, (BORROW TYPE C) | CY | 410 |
| 209002 | BORROW, TYPE B | CY | 879 |
| 302002 | DELAWARE NO. 3 STONE | TON | 274 |
| 401014 | SUPERPAVE TYPE B, PG 64-22 | TON | 748 |
| 401036 | SUPERPAVE TYPE C, PG 64-22, WEDGE | TON | 51 |
| 601052 | REINFORCED CONCRETE PIPE, 12", CLASS V | LF | 132 |
| 817043 | PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 12" | LF | 140 |
| 818001 | SUPPLY OF FLAT SHEET ALUMINUM SIGN PANEL, TYPE IV, RETROREFLECTIVE SHEETING | SF | 182 |
| 818003 | SUPPLY OF FLAT SHEET ALUMINUM SIGN PANEL, TYPE XI, RETROREFLECTIVE SHEETING | SF | 66 |
| 819011 | GALVANIZED TELESCOPING STEEL SIGN POSTS, 12' X 2", COMPLETE W/ BASEPOSTS AND HARDWARE | EACH | 37 |
| 819018 | INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE SIGN POST | EACH | 73 |
| 819019 | INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS | SF | 67 |
| 824003 | FLEXIBLE DELINEATOR, PERMANENT | EACH | 12 |
| 830001 | CONDUIT JUNCTION WELL, TYPE 1, 20" X 20" PRECAST CONCRETE | EACH | 4 |
| 908015 | PERMANENT GRASS SEEDING, STORMWATER | SY | 1687 |

**Delaware Department of Transportation**
**Quantity Sheet Summary**

**Proposal ID: T202104204**

**Project Descripton: HEP KC, SR15/Kenton Rd. at Central Church Rd. Intersection Improvements**

**NOT TO BE USED FOR BIDDING**

| Item Number | Description | Unit | Quantity |
|---|---|---|---|
| 908017 | TEMPORARY GRASS SEEDING | SY | 9973 |
| 908019 | PERMANENT GRASS SEEDING, STREAMBANK | SY | 4 |
| 908020 | EROSION CONTROL BLANKET MULCH | SY | 1714 |
| 908023 | STABILIZED CONSTRUCTION ENTRANCE | SY | 2450 |
| 908024 | STABILIZED CONSTRUCTION ENTRANCE, TOPDRESSING | TON | 548 |
| 908026 | EROSION CONTROL MULCH | SY | 16919 |
| 908503 | WETLAND MITIGATION GRASS SEEDING | SY | 2566 |
| 908524 | CONCRETE BLOCK LINING | SY | 27 |
| 909002 | SANDBAG DIVERSION | CF | 53 |
| 910008 | STORMWATER MANAGEMENT POND | CY | 1687 |
| 763000 | INITIAL EXPENSE/DE-MOBILIZATION | LS | 1 |
| 763501 | CONSTRUCTION ENGINEERING | LS | 1 |
| 201000 | CLEARING AND GRUBBING | LS | 1 |
| 202000 | EXCAVATION AND EMBANKMENT | CY | 8362 |
| 202003 | UNDERCUT EXCAVATION | CY | 879 |
| 202514 | PIEZOMETER | EACH | 2 |
| 204000 | TEST HOLE | CY | 95 |

**Delaware Department of Transportation**
**Quantity Sheet Summary**

**Proposal ID: T202104204**

**Project Descripton: HEP KC, SR15/Kenton Rd. at Central Church Rd. Intersection Improvements**

**NOT TO BE USED FOR BIDDING**

| Item Number | Description | Unit | Quantity |
|---|---|---|---|
| 905002 | REINFORCED SILT FENCE | LF | 907 |
| 905004 | INLET SEDIMENT CONTROL, DRAINAGE INLET | EACH | 1 |
| 905005 | INLET SEDIMENT CONTROL, CURB INLET | EACH | 9 |
| 906003 | SUMP PIT | EACH | 1 |
| 907017 | COMPOST FILTER LOGS | LF | 429 |
| 908002 | TOPSOIL | SY | 3028 |
| 908004 | TOPSOIL, 6" DEPTH | SY | 16919 |
| 908014 | PERMANENT GRASS SEEDING, DRY GROUND | SY | 18260 |
| 763598 | FIELD OFFICE, SPECIAL I | EAMO | 3 |
| 801000 | MAINTENANCE OF TRAFFIC | LS | 1 |
| 803001 | PROVIDE AND MAINTAIN PORTABLE CHANGEABLE MESSAGE SIGN | EADY | 60 |
| 804001 | PROVIDE AND MAINTAIN PORTABLE LIGHT ASSEMBLY (FLOOD LIGHTS) | EADY | 160 |
| 805001 | PLASTIC TRAFFIC CONTROL DRUMS | EADY | 12855 |
| 830002 | CONDUIT JUNCTION WELL, TYPE 4, 20" X 42-1/2" PRECAST CONCRETE | EACH | 9 |
| 831002 | PROVIDE AND INSTALL UP TO 4" SCEDULE 80 HDPE CONDUIT (BORE) | LF | 290 |
| 831004 | PROVIDE AND INSTALL UP TO 4" SCHEDULE 80 PVC CONDUIT (TRENCH) | LF | 2402 |
| 831006 | PROVIDE AND INSTALL UP TO 4" GALVANIZED STEEL CONDUIT (TRENCH) | LF | 30 |

**Delaware Department of Transportation**
**Quantity Sheet Summary**

**Proposal ID: T202104204**

**Project Descripton: HEP KC, SR15/Kenton Rd. at Central Church Rd. Intersection Improvements**

**NOT TO BE USED FOR BIDDING**

| Item Number | Description | Unit | Quantity |
|---|---|---|---|
| 832006 | PROVIDE AND INSTALL 1-CONDUCTOR #2 AWG STRANDED COPPER, TYPE USE-2 | LF | 132 |
| 832009 | PROVIDE AND INSTALL 1-CONDUCTOR #8 STRANDED COPPER, TYPE USE-2 | LF | 10042 |
| 834006 | POLE BASE, TYPE 6 | EACH | 16 |
| 835002 | CABINET BASE TYPE M | EACH | 1 |
| 842007 | PROVIDE AND INSTALL ELECTRICAL UTILITY SERVICE EQUIPMENT 120/240 | EACH | 1 |
| 843001 | ELECTRICAL TESTING | LS | 1 |
| 602505 | PERSONNEL SAFETY GRATE | EACH | 1 |
| 701011 | PCC CURB, TYPE 1-4 | LF | 574 |
| 701013 | PCC CURB, TYPE 1-8 | LF | 189 |
| 701020 | I.PCC CURB AND GUTTER, TYPE 3-2 | LF | 618 |
| 701021 | I.PCC CURB AND GUTTER, TYPE 3-4 | LF | 1704 |
| 701025 | PCC CURB TYPE 2 ROUNDABOUT | LF | 714 |
| 701027 | PCC CURB, TYPE 1-2 ROUNDABOUT | LF | 283 |
| 701031 | CURB OPENING, 2' OPENING | EACH | 2 |
| 705002 | PCC SIDEWALK, 6" | SF | 156 |
| 705521 | PATTERNED PCC SIDEWALK, 8" | SF | 7831 |

**Delaware Department of Transportation**
**Quantity Sheet Summary**

**Proposal ID: T202104204**

**Project Descripton: HEP KC, SR15/Kenton Rd. at Central Church Rd. Intersection Improvements**

**NOT TO BE USED FOR BIDDING**

| Item Number | Description | Unit | Quantity |
|---|---|---|---|
| 908527 | REFORESTATION | EACH | 1300 |
| 208000 | FLOWABLE FILL | CY | 74 |
| 207000 | PIPE, CULVERT, AND STRUCTURAL EXCAVATION | CY | 484 |
| 209006 | BORROW, TYPE F | CY | 469 |
| 301001 | GABC | CY | 1715 |
| 403000 | BITUMINOUS CONCRETE AND/OR COLD-LAID BITUMINOUS (TRM) CONCRETE | TON | 11 |
| 404001 | BITUMINOUS CRACK AND JOINT SEALING LESS THAN 3/4-INCH WIDE | LF | 160 |
| 601053 | REINFORCED CONCRETE PIPE, 15", CLASS V | LF | 137 |
| 601141 | REINFORCED CONCRETE FLARED END SECTION, 15" | EACH | 1 |
| 601142 | REINFORCED CONCRETE FLARED END SECTION, 18" | EACH | 2 |
| 602004 | DRAINAGE INLET, 48" X 30" | EACH | 4 |
| 602005 | DRAINAGE INLET, 48" X 48" | EACH | 6 |
| 710601 | INSTALLATION OF WATER MAINS AND ACCESSORIES, TW | LS | 1 |
| 760010 | PAVEMENT MILLING, BITUMINOUS CONCRETE PAVEMENT | SYIN | 3030 |
| 762000 | SAW CUTTING, BITUMINOUS CONCRETE | LF | 3358 |
| 763003 | BASELINE SCHEDULE TYPE 2 | LS | 1 |
| 763004 | MONTHLY UPDATE SCHEDULE TYPE 2 | EAMO | 3 |

**Delaware Department of Transportation**
**Quantity Sheet Summary**

**Proposal ID: T202104204**

**Project Descripton: HEP KC, SR15/Kenton Rd. at Central Church Rd. Intersection Improvements**

**NOT TO BE USED FOR BIDDING**

| Item Number | Description | Unit | Quantity |
|---|---|---|---|
| 706000 | MONUMENT | EACH | 16 |
| 706002 | RIGHT-OF-WAY MARKER, CAPPED REBAR | EACH | 10 |
| 707001 | RIPRAP, R-4 | SY | 52 |
| 707500 | CHANNEL BED FILL | CY | 2 |
| 708001 | GEOTEXTILES, STABILIZATION | SY | 2418 |
| 708003 | GEOTEXTILES, RIPRAP | SY | 40 |
| 709001 | PERFORATED PIPE UNDERDRAINS, 6" | LF | 2429 |
| 709011 | UNDERDRAIN OUTLET PIPE, 6" | LF | 17 |
| 709017 | UNDERDRAIN OUTLET | EACH | 1 |
| 401016 | SUPERPAVE TYPE B, PG 76-22 | TON | 748 |
| 209001 | BORROW, TYPE A | CY | 285 |
| 211000 | REMOVAL OF STRUCTURES AND OBSTRUCTIONS | LS | 1 |
| 401046 | SUPERPAVE TYPE C, PG 76-22 (NON-CARBONATE STONE) | TON | 894 |
| 504001 | CRACK AND JOINT SEALING LESS THAN 3/4 INCH WIDE | LF | 16 |
| 601032 | REINFORCED CONCRETE PIPE, 15", CLASS IV | LF | 286 |
| 601033 | REINFORCED CONCRETE PIPE, 18", CLASS IV | LF | 543 |
| 806001 | TRAFFIC OFFICERS | HOUR | 90 |

**Delaware Department of Transportation**
**Quantity Sheet Summary**

**Proposal ID: T202104204**

**Project Descripton: HEP KC, SR15/Kenton Rd. at Central Church Rd. Intersection Improvements**

**NOT TO BE USED FOR BIDDING**

| Item Number | Description | Unit | Quantity |
|---|---|---|---|
| 808002 | PROVIDE AND MAINTAIN TRUCK MOUNTED ATTENUATOR, TYPE II | EADY | 45 |
| 810001 | TEMPORARY WARNING SIGNS AND PLAQUES | EADY | 3070 |
| 811002 | FLAGGER, KENT COUNTY | HOUR | 1440 |
| 811014 | FLAGGER, KENT COUNTY, OVERTIME | HOUR | 360 |
| 813001 | TEMPORARY BARRICADES, TYPE III | LFDY | 5670 |
| 817002 | PERMANENT PAVEMENT STRIPING, SYMBOL/LEGEND, ALKYD-THERMOPLASTIC | SF | 36 |
| 817027 | RAISED/RECESSED PAVEMENT MARKER | EACH | 23 |
| 817031 | REMOVAL OF PAVEMENT STRIPING | SF | 2773 |
| 817042 | PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 6" | LF | 8249 |
| 847006 | LIGHTING CONTROL CABINET - 100A | EACH | 1 |
| 850521 | LUMINAIRE (LED), 250 WATTS, HPS EQUIVALENT | EACH | 16 |
| 851001 | ALUMINUM LIGHTING STANDARD WITH SINGLE DAVIT ARM, 30' POLE | EACH | 16 |
| 905001 | SILT FENCE | LF | 6144 |