STATE OF DELAWARE

THIS COPY IS FOR INFORMATION ONLY. YOU MUST REQUEST THE PROPOSAL FROM THE DEPARTMENT IN ORDER TO SUBMIT A BID.

DEPARTMENT OF TRANSPORTATION

BID PROPOSAL

for

CONTRACT T200507303.02

FEDERAL AID PROJECT NO. NHS-050(20)

BR 3-156, INDIAN RIVER INLET PARK ENHANCEMENTS

SUSSEX COUNTY

ADVERTISEMENT DATE: July 15, 2013

PROSPECTIVE BIDDERS ARE ADVISED THAT THERE WILL BE A MANDATORY PRE-BID MEETING FOR THIS CONTRACT ON Tuesday, July 23, 2013 at 2:30 p.m. IN THE DelDOT ADMINISTRATION CENTER, 800 BAY ROAD, U.S. ROUTE 113 SOUTH, DOVER, DELAWARE, 19901.

Completion Date 334 Calendar Days

SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
DELAWARE DEPARTMENT OF TRANSPORTATION
AUGUST 2001

Bids will be received in the Bidder's Room, Transportation Administration Center, 800 Bay Road, Dover, Delaware until 2:00 P.M. local time Thursday, August 8, 2013

Contract No.T200507303.02
Federal Aid Project No. NHS-050(20)

BR 3-156, INDIAN RIVER INLET PARK ENHANCEMENTS
SUSSEX COUNTY

GENERAL DESCRIPTION

LOCATION

These improvements are located in SUSSEX County more specifically shown on the Location Map(s) of the enclosed Plans.

DESCRIPTION

THE IMPROVEMENTS CONSIST OF FURNISHING ALL LABOR AND MATERIALS FOR BRIDGE 3-156 BRIDGE REPLACEMENT PARK ENHANCEMENT CONTRACT THAT REPLACES THE INDIAN RIVER INLET PARK AREA BACK TO THE STATE IT WAS IN 2004 BEFORE THE NEW INDIAN RIVER INLET BRIDGE WAS CONSTRUCTED. THE SCOPE OF THE PROJECT WAS DICTATED BY A MEMORANDUM OF AGREEMENT BETWEEN DELDOT AND DNREC. THE IMPROVEMENTS TO THE PARK WERE AGREED UPON DUE TO THE FACT THAT THE NEW BRIDGE TOOK UP MORE PARK LAND THAN THE ORIGINAL BRIDGE. THIS CONTRACT INVOLVES THE CONSTRUCTION OF PARKING LOTS, ACCESS ROADWAYS, TENT CAMPING AREAS, RV CAMPING AREAS, PLAYGROUND, AMPHITHEATER, AND PROMENADES, AND OTHER INCIDENTAL CONSTRUCTION IN ACCORDANCE WITH THE LOCATION, NOTES AND DETAILS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER.

COMPLETION DATE

All work on this contract must be complete within 334 Calendar Days . The Contract Time includes an allowance for 60 Weather Days. It is the Department's intent to issue a Notice to Proceed such that work starts on or about October 4, 2013.

PROSPECTIVE BIDDERS NOTES:

1. No retainage will be withheld on this contract.

2. The Department's External Complaint Procedure can be viewed on our Website at; http://www.deldot.gov/information/business/, or you may request a copy by calling (302) 760-2555.

3. This project incorporates the electronic bidding system **Expedite**, **version 5.9a**.. Bidders wishing to use the electronic bidding option will find the installation file on the plan holders bid file disk. The installation file and instructions are also available on our Website at: http://www.deldot.gov/information/business/bids/const_proj_bid_info.shtml.

4. BIDDERS MUST REQUEST A CD OF THE OFFICIAL PLANS AND SPECIFICATIONS FROM THE DEPARTMENT IN ORDER TO SUBMIT A BID.

4. Please note the Special Provision titled **Changes to Project Documents During Advertisement**. The Department is using an alternative method of providing bid documents for this contract.

5. **Prospective bidders are advised that there will be a mandatory pre-bid meeting for this contract on Tuesday, July 23, 2013 at 2:30 p.m. in the DelDOT Transportation Administration Center, 800 Bay Road, Dover, DE 19901.**

6. Proposed Trainee Plans as required. Number of required programs is listed in the Training Special Provisions within Contract General Notices. The program(s) must be submitted within 10 Calendar Days of notification of apparent low bidder status. Contract Award will not take place until acceptable On-the-Job (OJT) program plans are received by the Civil Rights Group of the Department.

   Failure of the apparent low bidder to present copies of an acceptable OJT Trainee Programs within ten (10) calendar days after the bid opening shall create a rebuttable presumption that the bid is not responsive.

7. **Appendix A** - Technical Specifications are provided on a separate CD disc and shall be considered part of this proposal.

8. **Park User Costs (PUC): Interim Milestone:** The contractor shall complete all work listed in phases one and two, including receipt of all Certificates of Occupancy for the following buildings no later than 12 May 2014:
   Bldg #2 "Admin Contact Station - North Day Use Parking Lot"
   Bldg #9 "Southwest Bath house - South Tent Campground"
   Bldg #8 "Southeast Bath house - South Tent Campground"
   Bldg #1E "Southeast Contact Station - Day Use Parking Lot"
   Bldg #1W "South West Contact Station - South RV Campground"
   Failure to complete all work assignments for the interim milestone by 12 May 2014 shall result in the assessment of a park user cost in the amount of $2,460.00 per day.

   The contractor shall complete all work in phase three including receipt of all Certificates of Occupancy for the following buildings no later than 5 September 2014:
   Bldg #3 "RV Laundry Facility - North RV Park"
   Bldg #4 "RV Shower Facility - North RV Park"
   Bldg #5 "Bath House - North Day Use Parking Lot"
   Failure to complete all work in phase three including receipt of all Certificates of Occupancy for the previously mentioned buildings no later than 5 September 2014 will result in the assessment of a park user cost in the amount of $1,230.00 per day in addition to Liquidated Damages.

9. **Prevailing Wage Rates:** Please note the State of Delaware Department of Labor has issued two separate prevailing wage rate determinations for this project. The attached prevailing wages for Building Construction shall apply ONLY to Item # 763569 - Buildings, as listed in Section 002, "Speciality Item" Building Construction, on the Bid Proposal Forms. The attached prevailing wages for Highway Construction are applicable to the remainder of the project.

CONSTRUCTION ITEMS UNITS OF MEASURE

English Code	English Description	Multiply By	Metric Code	Metric Description	Suggested CEC Metric Code
ACRE	Acre	0.4047	ha	Hectare	HECTARE
BAG	Bag	N/A	Bag	Bag	BAG
C.F.	Cubic Foot	0.02832	m^3	Cubic Meter	M3
C.Y.	Cubic Yard	0.7646	m^3	Cubic Meter	M3
EA-DY	Each Day	N/A	EA-DY	Each Day	EA-DY
EA-MO	Each Month	N/A	EA-MO	Each Month	EA-MO
EA/NT	Each Night	N/A	EA-NT	Each Night	EA/NT
EACH	Each	N/A	EA	Each	EACH
GAL	Gallon	3.785	L	Liter	L
HOUR	Hour	N/A	h	Hour	HOUR
INCH	Inch	25.4	mm	Millimeter	MM
L.F.	Linear Foot	0.3048	m	Linear Meter	L.M.
L.S.	Lump Sum	N/A	L.S.	Lump Sum	L.S.
LA-MI	Lane Mile	1.609	LA-km	Lane-Kilometer	LA-KM
LB	Pound	0.4536	kg	Kilogram	KG
MFBM	Thousand Feet of Board Measure	2.3597	m^3	Cubic Meter	M3
MGAL	Thousand Gallons	3.785	kL	Kiloliter	KL
MILE	Mile	1.609	km	Kilometer	KM
S.F.	Square Foot	0.0929	m^2	Square Meter	M2
S.Y.	Square Yard	0.8361	m^2	Square Meter	M2
SY-IN	Square Yard-Inch	0.8495	m^2-25 mm	Square Meter-25 Millimeter	M2-25 MM
TON	Ton	.9072	t	Metric Ton (1000kg)	TON
N.A.*	Kip	4.448	kN	Kilonewton	N.A.*
N.A.*	Thousand Pounds per Square Inch	6.895	MPa	Megapascal	N.A.*

*Not used for units of measurement for payment.

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GENERAL NOTICES

SPECIFICATIONS:

The specifications entitled "Delaware Standard Specifications for Road and Bridge Construction, August, 2001", hereinafter referred to as the Standard Specifications; Supplemental Standard Specifications; the Special Provisions; notes on the Plans; this Bid Proposal; and any addenda thereto, shall govern the work to be performed under this contract.

CLARIFICATIONS:

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

ATTESTING TO NON-COLLUSION:

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

QUANTITIES:

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

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)

> "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 or natural 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 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 or national origin.'

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 insure 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. Proof of said license compliance to be made prior to, or in conjunction with, the execution of a contract to which he has been named.

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 fourth the reasons and support for such adjustment.

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

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

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

Significant changes in the character of work: The engineer reserves the right to make, in writing, at any time during the work, such changes in quantities and such alterations in the work as are necessary to satisfactorily

complete the project. Such changes in quantities and alterations shall not invalidate the contract nor release the surety, and the contractor agrees to perform the work as altered.

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

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

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

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

CONFLICT WITH FEDERAL STATUTES OR REGULATIONS:

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

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

FEDERAL LABOR AND EMPLOYMENT REQUIREMENTS

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

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

CONVICT PRODUCED MATERIALS:

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

(1) Produced by convicts who are on parole, supervised release, or probation from a prison or

(2) Produced in a qualified prison facility and the cumulative annual production amount of such materials for use in Federal-aid highway construction does not exceed the amount of such materials produced in such facility for use in Federal-aid highway construction during the 12-month period ending July 1, 1987.

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

TO REPORT BID RIGGING ACTIVITIES:

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

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

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

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

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Specifications" set forth herein.

2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate work force in each trade on all construction work in the covered area, are as follows:

Goals for Minority Participation In Each Trade	Goals for Female Participation In Each Trade
12.3% (New Castle County) 14.5% (Kent & Sussex Counties)	6.9% (Entire State)

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

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

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

4. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is NEW CASTLE County.

REV. 11-3-80

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

1. As used in these specifications:

   a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;
   b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
   c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.
   d. "Minority" includes:
      i. Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
      ii. Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
      iii. Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
      iv. American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of $10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through 7p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered Construction contractors performing construction work in geographical areas where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Program Office or from the Federal procurement contracting offices. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

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

for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontractors from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the Contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female work force participating, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is under utilized).

10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

11. The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Order of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

14. The Contractor shall designate a responsible official to monitor all employment-related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government, and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily

understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

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

* * * * *

TRAINING SPECIAL PROVISIONS

This Training Special Provision supersedes subparagraph 7b of the Special Provision entitled "Specific Equal Employment Opportunity Responsibilities", (Attachment 1), and is in implementation of 23 U.S.C. 140(a). As part of the contractor's equal employment opportunity affirmative action program, training shall be provided as follows:

The contractor shall provide on-the-job training aimed at developing full journeyman in the type of trade or job classification involved.

The number of trainees to be trained under the special provision will be __1__. In the event the contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainees are to be trained by the subcontractor, provided however, that the contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The contractor shall also insure that this Training Special Provision is made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year apprenticeship or training.

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

Training and upgrading of minorities and women toward journeyman status is a primary objective of this Training Special Provision. Accordingly, the contractor shall make every effort to enroll minority trainees and women (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent that such persons are available within a reasonable area of recruitment. The contractor will be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the contractor is in compliance with this Training Special Provision. This training commitment is not intended, and not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

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

The minimum length and type of training for each classification will be as established in the training program selected by the contractor and approved by the Department of Highways and Transportation and the Federal Highway Administration. The Department of Highways and Transportation and the Federal Highway Administration shall approve a program if it is reasonably calculated to meet the equal employment opportunity obligations of the contractor and to qualify the average trainee for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program

shall be obtained from the State prior to commencing work the classification covered by the program. It is the intention of these provisions that the training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the division office. Some off-site training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

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

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

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

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

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

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

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INTERMODAL SURFACE TRANSPORTATION EFFICIENCY ACT & TRANSPORTATION EQUITY ACT

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

DISADVANTAGED BUSINESS ENTERPRISE (DBE) PROGRAM SPECIFICATION

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

The following definitions apply to this subpart:

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

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

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

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

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

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

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

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

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

DelDOT will establish specific goals for each particular DOT-assisted project which will be expressed as a percentage of the total dollar amount of contract bid.

The specific contract goals for this contract are:

Disadvantaged Business Enterprise 11 % Percent

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

Bidders are required to submit with their bids the completed DBE Program Assurance portion of the Certification document which will state the bidders intent of meeting the goals established for this contract;

or in the instance where a contractor cannot meet the assigned DBE Goals for this contract, he/she shall at the time of bid submit documentation required to verify that he/she has made a Good Faith Effort to meet the DBE Goals. Guidance for submitting a Good Faith Effort is identified in the next section and in the DBE Program Plan. Further, the apparent low bidder must submit to DelDOT within ten (10) calendar days after the bid opening, executed originals of each and every DBE subcontract to satisfy contract goals consistent with the DBE Program Assurance submitted as part of the bid package.

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

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

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

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CRITICAL DBE REQUIREMENTS

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

1. In the event that the bidder cannot meet the DBE goal as set forth in this specification, he/she shall at the time of bid submit to the Department that percentage of the DBE Goal that will be met, if any, on the written and notarized assurance made a part of this contract. The contractor shall also at the time of bid submit all documentation that the contractor wishes to have the Department consider in determining that the contractor made a Good Faith Effort to meet contract DBE Goals. The Department will not accept Good Faith Effort documentation other than on the scheduled date and time of the bid opening. However, the Department may ask for clarification of information submitted should the need arise.
2. A bid which does not contain either a completely executed DBE Program Assurance and/or Good Faith Effort documentation, where appropriate, shall be declared non-responsive and shall not be considered by the Department.
3. Failure of the apparent low bidder to present originals of all DBE subcontracts to substantiate the volume of work to be performed by DBE's as indicated in the bid within ten (10) calendar days after the bid opening shall create a rebuttable presumption that the bid is not responsive.
4. Bidders are advised that failure to meet DBE Goals during the term of the contract may subject them to Department sanctions as identified in the DBE Program Plan.
5. In the execution of this contract, the successful bidder agrees to comply with the following contract clauses:

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

   Retainage: The prime contractor agrees to return retainage to each subcontractor within 15 calendar days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of DelDOT. This clause covers both DBE and non-DBE subcontractors. As guidance, once a subcontractor has satisfactorily completed the physical work, and has given to the prime contractor a certified statement

that all laborers, lower tier contractors, and materialmen who have furnished labor and materials to the subcontractor have been paid all monies due them, the prime contractor shall return retainage to the subcontractor within 15 calendar days.

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

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

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

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GUIDANCE FOR GOOD FAITH EFFORT

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

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

1. Efforts made to select portions of the work proposed to be performed by DBEs in order to increase the likelihood of achieving the stated goal. Selection of portions of work are required to at least equal the goal for DBE utilization specified in this contract.

2. Written notification at least ten (10) calendar days prior to the opening of a bid soliciting DBE interest in participating in the contract as a subcontractor or supplier and for specific items of work.

3. Efforts made to obtain and negotiate with DBE firms for specific items of work:
   a. Description of the means by which firms were solicited (i.e. by telephone, e-mail, written notice, advertisement).
   b. The names, addresses, telephone numbers of DBE's contacted, the dates of initial contact; and whether initial solicitations of interest were followed-up by contacting the DBEs to determine with certainty whether the DBEs were interested.
   c. A description of the information provided to DBE firms regarding the plans, specifications and estimated quantities for portions of the work to be performed.
   d. A statement of why additional agreements with DBE's were not reached in order to meet the projected goal.
   e. Listing of each DBE contacted but not contracted and the reasons for not entering a contract.

4. Efforts made to assist DBEs that need assistance in obtaining bonding, insurance, or lines of credit required by the contractor.

5. Reasons why certified DBEs are not available or not interested.

6. Efforts to effectively use the services of available disadvantaged community organizations; disadvantaged contractor's groups; local, state and federal DBE assistance offices; and other organizations that provide assistance in recruitment and placement of DBEs.

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

1. Failure to contract with a DBE solely because the DBE was unable to provide performance and/or

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

Administrative reconsideration:

Within five (5) days of being informed by DelDOT that it is not responsive because it has not documented sufficient good faith efforts, a bidder may request administrative reconsideration. Bidder should make this request in writing to the following reconsideration official: Director of Administration, DelDOT, P. O. Box 778, Dover, Delaware 19903. The reconsideration official will not have played any role in the original determination that the bidder did not document sufficient good faith efforts.

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

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REQUIRED CONTRACT PROVISIONS - FEDERAL-AID CONSTRUCTION CONTRACTS
(Exclusive of Appalachian Contracts)

FHWA-1273 -- Revised May 1, 2012 http://www.fhwa.dot.gov/programadmin/contracts/1273/1273.docx

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

I. GENERAL

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

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

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

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

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

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

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

II. NONDISCRIMINATION

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

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order

11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

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

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

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

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

6. Training and Promotion:

   a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

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

welfare assistance in accordance with 23 U.S.C. 140(a).

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

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

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

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

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

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

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

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

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

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

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

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

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

    b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the

contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

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

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

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

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

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

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

III. NONSEGREGATED FACILITIES

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

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

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

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

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

1. Minimum wages

    a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits

(or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH–1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

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

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

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

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

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

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

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

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

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider

as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

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

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

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

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

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

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

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

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

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

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

4. Apprentices and trainees

a.. Apprentices (programs of the USDOL).

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

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

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the

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

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

b. Trainees (programs of the USDOL).

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

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

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

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

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

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

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

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

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

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

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

10. Certification of eligibility.

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

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

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

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

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

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

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

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

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

VI. SUBLETTING OR ASSIGNING THE CONTRACT

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

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

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

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

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

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

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

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

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

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

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

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

VII. SAFETY: ACCIDENT PREVENTION

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

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards,

safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

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

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

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

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

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

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

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

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

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

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

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

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

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

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

Air Act.

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

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

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

1. **Instructions for Certification – First Tier Participants:**

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

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

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

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

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

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

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

   h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in

covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

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

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

* * * * *

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

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

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

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

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

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

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

2. Instructions for Certification - Lower Tier Participants:

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

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

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

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

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person,"

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

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

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

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

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

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

* * * * *

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

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

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

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

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

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

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

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

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

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

* * * * *

PREVAILING WAGES

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

REQUIREMENT BY DEPARTMENT OF LABOR FOR SWORN PAYROLL INFORMATION

Title 29 Del.C. §6960 stipulates;

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

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

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

PREVAILING WAGE REQUIREMENTS

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

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

STATE OF DELAWARE
DEPARTMENT OF LABOR
DIVISION OF INDUSTRIAL AFFAIRS
OFFICE OF LABOR LAW ENFORCEMENT
PHONE: (302) 451-3423

Mailing Address:
225 CORPORATE BOULEVARD
SUITE 104
NEWARK, DE 19702

Located at:
225 CORPORATE BOULEVARD
SUITE 104
NEWARK, DE 19702

PREVAILING WAGES FOR **HIGHWAY CONSTRUCTION** EFFECTIVE MARCH 15, 2013

CLASSIFICATION	NEW CASTLE	KENT	SUSSEX
BRICKLAYERS	46.83	46.83	14.51
CARPENTERS	42.64	50.06	39.82
CEMENT FINISHERS	28.79	26.13	23.29
ELECTRICAL LINE WORKERS	22.50	43.42	21.25
ELECTRICIANS	60.60	60.60	60.60
IRON WORKERS	42.20	23.87	25.35
LABORERS	28.95	26.97	25.35
MILLWRIGHTS	16.11	15.63	13.49
PAINTERS	58.07	58.07	58.07
PILEDRIVERS	66.42	23.75	26.95
POWER EQUIPMENT OPERATORS	37.00	29.47	27.16
SHEET METAL WORKERS	22.75	20.31	18.40
TRUCK DRIVERS	29.08	21.42	19.13

CERTIFIED : 7/10/13 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) 451-3423.

NON- REGISTERED APPRENTICES MUST BE PAID THE MECHANICS RATE.

PROJECT: T200507303.02 BR3-156, INDIAN RIVER INLET PARK ENHANCEMENTS – Parking Lots, Access Roadways, Roadway Lighting, Tent and RV Camping Areas and Playground, Sussex County, DE

STATE OF DELAWARE
DEPARTMENT OF LABOR
DIVISION OF INDUSTRIAL AFFAIRS
OFFICE OF LABOR LAW ENFORCEMENT
PHONE: (302) 451-3423

Mailing Address:
225 CORPORATE BOULEVARD
SUITE 104
NEWARK, DE 19702

Located at:
225 CORPORATE BOULEVARD
SUITE 104
NEWARK, DE 19702

PREVAILING WAGES FOR **BUILDING CONSTRUCTION** EFFECTIVE MARCH 15, 2013

CLASSIFICATION	NEW CASTLE	KENT	SUSSEX
ASBESTOS WORKERS	21.87	26.94	39.20
BOILERMAKERS	65.47	33.22	48.83
BRICKLAYERS	46.83	46.83	46.83
CARPENTERS	50.06	50.06	39.82
CEMENT FINISHERS	27.61	29.11	21.20
ELECTRICAL LINE WORKERS	43.49	37.29	28.44
ELECTRICIANS	60.60	60.60	60.60
ELEVATOR CONSTRUCTORS	75.33	40.93	30.55
GLAZIERS	64.10	64.10	54.20
INSULATORS	51.48	51.48	51.48
IRON WORKERS	59.12	59.12	59.12
LABORERS	38.30	38.30	38.30
MILLWRIGHTS	62.18	62.18	48.75
PAINTERS	42.02	42.02	42.02
PILEDRIVERS	67.87	37.64	30.45
PLASTERERS	28.55	28.55	17.50
PLUMBERS/PIPEFITTERS/STEAMFITTERS	59.00	49.26	46.28
POWER EQUIPMENT OPERATORS	57.06	57.06	24.13
ROOFERS – COMPOSITION	21.77	17.96	19.34
ROOFERS – SHINGLE/SLATE/TILE	17.59	17.50	16.45
SHEET METAL WORKERS	62.74	62.74	62.74
SOFT FLOOR LAYERS	45.97	45.97	45.97
SPRINKLER FITTERS	51.75	51.75	51.75
TERRAZZO/MARBLE/TILE FINISHERS	51.41	51.41	45.45
TERRAZZO /MARBLE/TILE SETTERS	59.03	59.03	52.63
TRUCK DRIVERS	26.58	23.89	20.03

CERTIFIED : 7/10/13 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) 451-3423.

NON- REGISTERED APPRENTICES MUST BE PAID THE MECHANICS RATE.

PROJECT: T200507303.02 BR3-156, INDIAN RIVER INLET PARK ENHANCEMENTS – Contact Stations, RV and Shower Building, Amphitheater, Bath House, bath House Renovations and Pavilion, Sussex County, DE

FEDERAL DAVIS-BACON WAGE RATES 05/10/2013 DE15

General Decision Number: DE20120015

STATE: Delaware

Construction Type: Highway

COUNTY: Sussex County in Delaware

HIGHWAY CONSTRUCTION PROJECTS

Modification Number	Publication Date
0	05/10/2013

SUDE2010-003 04/24/2013

Rates	Fringes
Bricklayer	14.51
Carpenter	39.82
Cement Mason/Concrete Finisher	23.29
ELECTRICIAN	
Electrician	60.60
Line Worker	21.25
Ironworker	25.35
Laborer	26.82
Millwright	13.49
Operator: Piledriver	26.95
Painter	58.07
Power Equipment Operator	27.16
Sheet Metal Worker	18.40
Truck Driver	22.15

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

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

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

Union Identifiers

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for the classification. Example: PLUM0198-005 07/01/2011. The first four letters, PLUM, indicate the international union and the four-digit number, 0198, that follows indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rate.

0000/9999: weighted union wage rates will be published annually each January.

Non-Union Identifiers

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union rates, LA indicated the State of Louisiana; 2004 is the year of the survey: and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Way Determination on the date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

WAGE DETERMINATION APPEALS PROCESS

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

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

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

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

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

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

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

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

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

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

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

END OF GENERAL DECISION

GENERAL DECISION: DE130006 05/31/2013 DE6

Superseded General Decision Number: DE20120006

State: DELAWARE

Construction Type: BUILDING

County: Sussex County in Delaware

Modification Number	Publication Date
0	01/04/2013
1	05/31/2013

ASBE0042-001 07/18/2012

	Rates	Fringes
Asbestos Worker/Heat and Frost Insulator	30.17	21.26

BOIL0193-004 01/01/2012

	Rates	Fringes
Boilermaker	37.11	21.21

BRDE0001-003 05/01/2012

	Rates	Fringes
Bricklayer	28.90	17.33

CARP0626-00 05/01/2013

	Rates	Fringes
Carpenter (Including Acoustical Ceiling Install and Drywall Hanging)	30.57	20.09

CARO1823-007 05/01/2011

	Rates	Fringes
Soft Floor Layers, Carpet & Vinyl	24.50	18.34

CARP1906-006 07/01/2012

	Rates	Fringes
MILLWRIGHTS	36.11	27.94

ENGI0542-028 06/01/2010

	Rates	Fringes
OPERATOR: Crane	34.54	21.27

FOOTNOTE: A. PAID HOLIDAYS: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas Day, and Election Day (provided the employee works the scheduled work day following the holiday)

LABO0199-002 05/01/2012

	Rates	Fringes
LABORERS:		
Common/Unskilled	23.00	14.85

PAIN0021-017 05/01/2012

	Rates	Fringes
Glaziers	38.35	23.80

PAIN0021-020 05/01/2010

	Rates	Fringes
Painters:		
Brush and Roller	26.19	15.28

SUDE2007-003 08/16/2007

	Rates	Fringes
Electrician	21.01	3.55
OPERATOR: Backhoe	10.15	2.03

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

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

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

Union Identifiers

An identifier enclosed in dotted lines beginning with characters other that "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example: PLUM0198-005 07/01/2011. The first four letters, PLUM, indicate the international union and the four-ditit number, 0198, that follows indicates the local union number or district council number where applicable, I.E., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rate.

0000/9999: weighted union wage rates will be published annually each January.

Non-Union Identifiers

Classification listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications, and rates under that identifier were issued as a General Wage Determination on the date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

WAGE DETERMINATION APPEALS PROCESS

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

* an existing published wage determination

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

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

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

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

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

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

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

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

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

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

END OF GENERAL DECISION

APPLICABILITY OF DAVIS-BACON LABOR STANDARD PROVISIONS TO FLAGGERS

The U.S. Department of Labor has established that the duties of flaggers working on contracts covered by the Davis-Bacon Act, are manual and physical in nature. Accordingly, all employees performing the work of flaggers on Davis-Bacon covered contracts shall be entitled to receive applicable prevailing wage rates.

* * * * *

ALL AGENCY MEMORANDUM NO. 130
U.S. DEPARTMENT OF LABOR
EMPLOYMENT STANDARDS ADMINISTRATION
WAGE AND HOUR DIVISION
WASHINGTON, DC 20210

GUIDELINES

HIGHWAY CONSTRUCTION

Highway projects include the construction, alteration, or repair of roads, streets, highways, runways, taxiways, alleys, trails, paths, parking areas, and other similar projects not incidental to building or heavy construction.

EXAMPLES: Alleys, Base Courses, Bituminous treatments, Bridle Paths, Concrete pavement, Curbs, Excavation and embankment (for road construction), Fencing (highway), Grade crossing elimination (overpasses and underpasses), Guard rails on highway, Highway signs, Highway bridges (overpasses, underpasses, grade separation), Medians, Parking lots, Parkways, Resurfacing streets and highways, Roadbeds, Roadways, Runways, Shoulders, Stabilizing courses, Storm sewers incidental to road construction, Street paving, Surface courses, Taxiways, and Trails.

ANY QUESTIONS REGARDING THE APPLICATION OF THE GUIDELINES ABOVE TO A PARTICULAR PROJECT OR ANY DISPUTES REGARDING THE APPLICATION OF THE WAGE SCHEDULES ARE TO BE REFERRED TO THE WAGE AND HOUR DIVISION, U.S. DEPARTMENT OF LABOR FOR RESOLUTION, AND THE INSTRUCTIONS OF THE WAGE AND HOUR DIVISION ARE TO BE OBSERVED IN ALL INSTANCES.

* ALL AGENCY MEMORANDUM NO. 130
U.S. DEPARTMENT OF LABOR
EMPLOYMENT STANDARDS ADMINISTRATION
WAGE AND HOUR DIVISION
WASHINGTON, DC 20210

SUPPLEMENTAL SPECIFICATIONS
TO THE
AUGUST 2001
STANDARD SPECIFICATIONS

EFFECTIVE AS OF THE ADVERTISEMENT DATE OF THIS PROPOSAL AND INCLUDED BY REFERENCE

The Supplemental Specifications can be viewed and printed from the Department's Website.

To access the Website;
- in your internet browser, enter; http://www.deldot.gov
- on the left side of the page under 'INFORMATION', Click; 'Publications'
- scroll down under 'MANUALS' and Click; "Standard Specifications 2001"

The full Website Link is;
http://www.deldot.gov/information/pubs_forms/manuals/standard_specifications/index.shtml

Printed copies of the Supplemental Specifications are available upon request. A printed copy of the above referenced Supplemental Specifications will be included in the final contract documents upon award.

The Contractor shall make himself aware of these revisions and corrections (Supplemental Specifications), and apply them to the applicable item(s) of this contract.

SPECIAL PROVISIONS

CHANGES TO PROJECT DOCUMENTS DURING ADVERTISEMENT

1. PRINTED PLANS AND SPECIFICATIONS NOT AVAILABLE FROM DELDOT.

The Department is not providing printed plans or specifications for this project. Bidders must contact the Department in order to receive a CD that contains all bid documents. Bidders are able to use the CD to print the plans and specifications, or have them printed from the Website. While the plans and specifications are available on-line at DelDOT's Website, the Website bid documents are not authorized for submitting bids, and the Website documents are marked as such. To receive required bid Documents on a CD, contact:

Contract Administration
Delaware Department of Transportation
P.O. Box 778, Dover, DE 19903
e-mail: dot-ask@state.de.us
Phone: (302) 760-2030
FAX: (302) 739-2254

The Department is providing a printed set of plans and specifications available for viewing in the Bidder's Room, Transportation Administration Center, 800 Bay Road, Dover, Delaware, Monday through Friday excluding holidays from 8:00A.M. through 4:15 P.M..

2. QUESTIONS AND ANSWERS

All questions pertaining to this project are to be submitted to the following e-mail address:

dot-ask@state.de.us

Questions and Answers will be dated and posted periodically on Delaware's Bid Solicitation Directory Website located at: http://www.bids.delaware.gov/

The final Questions and Answers will be posted no later than the end of the day, two working days prior to the bid date.

All Questions and Answers posted by the Department on the above Website are included by reference and become part of the contract documents. The awarded bidder will receive a hard copy of the final posted Questions and Answers.

Potential bidders that do not have access to the internet may contact Jim Hoagland, Contract Services Administrator, by telephone at (302) 760-2036 to make other arrangements.

NOTE: There is space provided on the CERTIFICATION page to insert the Posted Date of the final Questions and Answers. The Final Posted Date is the latest Posted Date of the Questions and Answers one day prior to Bid Date. This final Posted Date must be submitted on the Certification page.

3. ADDENDA

The Department is not providing printed Addendums, if issued, for this project. **All addendums will be posted on the Department's Website, and are included by reference and become part of the contract documents**. It is the responsibility of the bidder to check the Website as needed. If there are Addendums issued, the final Addendum will be posted no later than the end of the day, two working days prior to the bid date.

NOTE: There is space provided on the CERTIFICATION page to insert each issued Addendum and the date you acknowledge receipt of the addendum. Each Addendum number and date acknowledged must be submitted on the Certification page.

CONSTRUCTION ITEM NUMBERS

All construction pay items are assigned a six (6) digit number, shown as Item Number on the Plans and/or in the Special Provisions, and shall be interpreted in accordance with the following:

Standard Item Number:

The first three digits of the construction item numbers indicates the Section number as described in the Standard Specifications, and all applicable requirements of the Section shall remain effective unless otherwise modified by the Special Provisions. The last three digits of the construction item identifies the item by sequential number under that Section. Sequential numbers for all items covered under Standard Specifications range from 000 to 499. A comprehensive list of construction item numbers begins on page 421 of the Standard Specifications. Additions to this list will be made as required.

Special Provisions Item Number:

The first three digits of the construction items, covered under Special Provisions, indicates the applicable Section number of the Standard Specifications, and shall be governed fully by the requirements of the Special Provisions. The last three digit of the items covered under Special Provisions identifies the item by sequential number. Sequential numbers for Special Provision items, range from 500 to 999.

Examples

Standard Item Number - 202000 Excavation and Embankment

202 Indicates Section Number

000 Indicates Sequential Number

Special Provision Item Number - 202500 Grading and Reshaping Roadway

202 Indicates Section Number

500 Indicates Sequential Number

401502 - ASPHALT CEMENT COST ADJUSTMENT

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

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

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

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

Actual quantity of asphalt cement qualifying for any Asphalt Cement Cost Adjustment will be computed on the basis of weight tickets and asphalt percentage from the approved job mix formula.

For Recycled Hot-Mix the asphalt percentage eligible for cost adjustment shall be only the new asphalt cement added to the mix.

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

The Asphalt cement cost adjustment will be calculated on grade PG 64-22 asphalt regardless of the actual grade of asphalt used. The Project Asphalt Cement Base Price for the project will be $600.00 per ton ($661.39 per metric ton).

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

NOTE

Application of Asphalt Cement Cost Adjustment requirements as indicated above shall apply only to those contracts involving items related to bituminous base and pavements, and with bitumen, having a total of 1,000 tons (1,000 metric tons) or more of hot-mix bid quantity in case of Sections 401, 402 and 403; and 15,000 gallons (60 000 liters) or more in case of Sections 304, 404 and 405.

302513 - CRUSHED P.C. CONCRETE BASE COURSE

Description:

The item shall consist of removing, hauling, stockpiling, preparing the subgrade, placing, and compacting Crushed PC Concrete Base Course in areas of full-depth reconstruction in accordance with the locations and details on the Plans and as directed by the Engineer.

Materials:

The Crushed PC Concrete Base Course must be reduced into particles meeting the gradation requirements of Graded Aggregate Base Course, Type B as specified in Subsection 821.03.

Construction Methods:

The subgrade shall be properly constructed in accordance with Subsection 202.06. No base course material shall be placed until the subgrade has been approved by the Engineer. The placement shall be in accordance with Section 302.04 (a) and (b).

Method of Measurement:

The quantity of Crushed PC Concrete Base Course will be measured by the cubic meter. The volume of cubic meters will be measured as the number of square meters of surface area of Crushed PC Concrete Base Course, placed and accepted, multiplied by the depth shown on the Plans. If the depth of the Crushed PC Concrete Base Course, placed and accepted, is greater than the depth shown on the Plans, the plan depth will be used to measure the quantity for payment.

If the limits of measurement for pay quantities for Crushed PC Concrete Base Course are designated on the Plans, the quantity of Crushed PC Concrete Base Course measured for payment will be the number of square meters of surface area multiplied by the depth, placed within the payment lines and grades shown on the Plans. If the limits are not designated on the Plans, or have been changed by the Engineer, in-place dimensions of the accepted Crushed PC Concrete Base Course will be established. The computation of quantity will be made from cross-sections taken after the completion of work under this Section.

Materials placed beyond the designated lines and grades as shown on the Plans or beyond the limits established by the Engineer will not be measured for payment. There will be no separate measurement made for the water applied as required in subsection 302.04.

Basis of Payment:

The quantity of Crushed PC Concrete Base Course will be paid for at the Contract unit price per cubic meter installed, as required by the Contract for this material. Price and payment will constitute full compensation for removing, hauling, stockpiling, preparing the subgrade, placing and compacting the materials, and for furnishing all labor, equipment, tools, and incidentals required to complete the work.

No payment will be made for materials placed beyond the designated lines and grades as shown on the Plans or beyond the limits established by the Engineer.

7/21/99

302514 – MILLED HOT-MIX BASE COURSE

Description:

It is the intent of this Special Provision to qualify the use of milled hot-mix asphalt pavement material in lieu of graded aggregate as a base course. All requirements of Section 302 shall remain in effect except as modified below:

Materials:

The material used to construct milled hot-mix asphalt pavement base courses shall be uniformly graded with a maximum size of 1 1/2 (38 mm).

Subgrade Preparation:

The subgrade shall be properly constructed in accordance with Subsection 202.06. No base course material shall be placed until the subgrade has been approved by the Engineer.

Placement:

a. *Equipment.* The milled material shall be spread uniformly by an approved spreading machine or box in such a manner that no segregation occurs. A conventional motor grader will not be approved for placement of milled material on mainline roadway sections.

Where it is not possible to use a spreading machine or box in patching or other tight areas, other approved methods can be used only in such manner that no segregation occurs. Compaction shall be uniformly attained by approved rollers or compactors. No milled materials shall be placed until approved equipment is on the Project site and is operational.

b. *Spreading and Compacting.* Milled material shall be placed in successive layers. Each layer shall be placed in a level, uniform cross-section not to exceed 12 (300 mm) in depth, loose measurement, unless otherwise approved by the Engineer. The milled material shall be deposited and spread parallel to the centerline and the layer shall extend to the full width as shown on the Plans. The milled material shall be handled so that no segregation of fine or coarse particles occurs. No more than 1,000 (300 m) of material, as measured along the roadway centerline, shall be spread in advance of compaction operations. Each layer shall be properly compacted as specified, before starting the next layer.

Compaction or rolling shall be performed parallel to the roadway centerline starting at the edges and progressing toward the center. It shall continue until each layer is thoroughly and uniformly compacted to the full width as shown on the Plans.

The milled material shall be compacted by the following method: a sheepsfoot roller (minimal 50 ton static roller) shall make the required number of passes on the base material to achieve the target density followed by a back-drag by either a bulldozer or a motor grader. After the pavement base material has been placed, a 15 ton/1800 vpm (minimum) vibratory steel wheel roller shall compact the base material. Compaction will be measured per subsection *Performance* below. In small areas where the above noted equipment cannot be used, the contractor must request approval from the Department to place the millings with other equipment. The Department reserves the right to reject or approve the areas for placement of millings as determined by the Engineer.

After compaction, all voids in the surface of each layer will be filled with millings and compacted (with the vibratory steel wheel roller) until the layer of base material is well bonded and firm, as determined by the Engineer.

In no case shall vehicles be allowed to travel in a single track or to form ruts in the base

course. If any sharp irregularities are formed int he subgrade or base course material, the affected area shall be scarified to a depth of 6 (150 mm) and compacted to conform to the requirements of Section 202 or this Section.

c. *Performance*. Compaction of milled hot-mix asphalt pavement base courses will be monitored by measuring the in-place density using a nuclear density gauge and comparing it to a control strip target density. The mean base compaction shall be at least 98% of the control strip target density and sufficiently uniform that individual test results are at least 96% of the control strip target density, the base course represented by the test will be considered defective and the Contractor shall further compact the area. After further compaction, the original test site and one other randomly selected site within the area will be tested. The average of two test results will be included in the mean density for that day's placement.

To determine the control strip target density, a control strip with a minimum length of 300 (90 m) shall be constructed at the beginning of work on each pavement base. Each control strip is to remain in place and become a section of the completed roadway. A control strip shall have an area of at least 400 yd² (325 m²). For small areas, the Contractor may request to have a test strip waived. This request shall be submitted to the Engineer for review.

Upon completion of the rolling, the mean density of the control strip will be determined by averaging the results of ten nuclear density tests taken at randomly selected sites within the control strip. The mean density of the control strip shall be the target density for the remainder of the pavement base course which it represents. Compaction shall be expressed as a percentage of the target density.

The finished surface of the graded aggregate base course shall not vary from that required on the Plans by more than 1/2 (13 mm) when tested with a 10 (3.048 m) straightedge applied to the surface parallel to the centerline of the pavement and when tested with a template cut to the cross-section of the pavement. The actual thickness of the graded aggregate base course shall not be more than 1/2 (13 mm) less than the thickness shown on Plans. Those portions of completed base course not meeting these performance requirements shall be completely removed and replaced with proper material placed in accordance with this Section.

A straightedge meeting the approval of the Engineer shall be supplied by the Contractor at each placement operation. The straightedge shall be constructed of rigid materials that resist warping and bending.

Method of Measurement:

The quantity of milled hot-mix base course will be measured by the cubic yard (cubic meter) and will be paid for under Item 302007 - Graded Aggregate Base Course. The volume of cubic yards (cubic meters) will be measured as the number of square yards (square meters) of surface area of milled hot-mix base course, placed and accepted, multiplied by the depths shown on the Plans. If the depth of milled hot-mix base course, placed and accepted, is greater than the depth shown on the Plans, the Plan depth will be used to measure the quantity of payment.

If the limits of measurement for pay quantities for milled hot-mix base course are designated on the Plans, the quantity of milled hot-mix base course measured for payment will be the number of square yards (square meters) of surface area multiplied by the depth placed within the payment lines and grades shown on the Plans. If the limits are not designated on the Plans, or have been changed by the Engineer, in-place dimensions of the accepted milled hot-mix base course will be established. The computation of quantity will be made from cross-sections taken after the completion of work under this Section.

Materials placed beyond the designated lines and grades as shown on the Plans or beyond the limits established by the Engineer will not be measured for payment.

There will be no separate payment made for filling voids with millings as required under Placement subsection (b) *Spreading and Compaction*.

Basis of Payment:

Millings used for Base Course will be paid at the unit bid price for Item 302007 - Graded Aggregate Base Course, Type B. All costs to bring the millings into compliance with the requirements of 302514 are incidental to Item 302007. No payment will be made under this item 302514.
Price and payment will constitute full compensation for hauling, stockpiling (includes any double handling of material), preparing the subgrade, placing and compacting the materials, and for all labor, equipment, tools and incidental required to complete the work.

No additional compensation will be made to the Contractor to crush, screen or otherwise modify the milled hot-mix base course to meet the necessary gradation.

No payment will be made for materials placed beyond the designated lines and grades as shown on the Plans or beyond the limits established by the Engineer.

10/31/05

401510 - POROUS FLEXIBLE PAVEMENT

Description:

This work consists of furnishing all materials and constructing porous flexible pavement in accordance with the notes and details on the Plans, as described herein, and as directed by the Engineer.

Materials and Construction Methods:

The Support System for the porous flexible pavement shall be "ECO Paver" as manufactured by E. P. Henry Corporation (201 Park Avenue, Woodbury, NJ 08096; Telephone - 609 - 845-6200); "Uni Echo-Stone" as manufactured by Unilock (229 Route 541 Bypass, Lumberton, NJ 08048; (609)-914-0000); "Aqua-Loc" as manufactured by Hanover (5000 Hanover Road, Hanover, PA 17331: (800)-426-4242); or approved equal.

Topsoil, and Graded Aggregate, Type B for the job shall conform to the material requirements of respective Sections 732 and 821 of the Standard Specifications.

The area of porous flexible pavement shall be excavated, graded and compacted to 95% or more of the laboratory maximum density. Once the subgrade is accepted, the base material, as specified on the Plans, shall be spread and compacted. The Support System shall then be placed as per the manufacturer's recommendations.

The pourous flexible pavement shall be filled and compacted with topsoil, seeded with permanent seed-dry ground and Section 735 - Mulching.

Method of Measurement:

The quantity of porous flexible pavement will be measured in square feet (meters) of porous flexible pavement installed and accepted.

Basis of Payment:

The quantity of porous flexible pavement will be paid for at the Contract unit price per square foot (meter). Price and payment will constitute full compensation for furnishing and placing all materials as described herein and on the Plan details (graded aggregate, sand, topsoil, concrete slab, etc.), excavation, grading, compacting, seeding and mulching, for all labor, tools, equipment and necessary incidentals to complete the work.

6/28/13

401699 - QUALITY CONTROL/QUALITY ASSURANCE OF BITUMINOUS CONCRETE

.01 Description.

This item shall govern the Quality Control/Quality Assurance Testing for supplying hot-mix asphalt plant materials and constructing hot-mix asphalt pavements.

The Contractor shall be responsible for providing the quality level of materials and construction incorporated into the Contract that will meet the requirements of the Contract. The Contractor shall perform all necessary quality control inspection, sampling, and testing. The Engineer will evaluate all materials and construction for acceptance. The procedures for Quality Control and Acceptance are described in this Section.

.02 Definitions.

Acceptable Quality Level (AQL): That level of percent within limits (PWL) to which the Engineer will consider the work completely acceptable.
Acceptance Plan: Factors that comprise the Engineer's determination of the degree of compliance with contract requirements and value of the product. These factors include the Engineer's sampling, testing, and inspection.
Delaware Asphalt Pavement Association (DAPA): The organization representing the interests of hot-mix asphalt producers and Contractors. The Engineer has a copy of the DAPA officers' names and point(s) of contact.
Dispute Resolution: The procedure used to resolve conflicts resulting from discrepancies between the Engineer's and the Contractor's results of sufficient magnitude to impact payment. The testing will take place at a location and time mutually agreeable by both the Engineer and the Contractor.
Full Depth Construction – Construction of an adequate pavement box on a subgrade and subbase prepared by the contractor
Independent Assurance: An unbiased and independent verification of the Quality Assurance system used, and the reliability of the test results obtained in regular sampling and testing activities. The results of Independent Assurance are not to be directly used as a basis of material acceptance.
Job Mix Formula (JMF)/Mixture Identification (ID): The target values for individual aggregate size gradation percentages and the asphalt percentage, the sources of each of the component materials, the proposed proportions of component materials to be used to meet those target values, the asphalt proportion, and the mixing temperature. The Engineer will assign uniquely individual mixture identification for each JMF submitted and approved.
Lower Quality Index (QL): The index reflecting the statistic related to the lower boundary to which a sample (or sample statistic) may deviate from the target value and still be considered acceptable.
Mean: A statistical measure of the central tendency – the average value.
Operational Day: A day in which the Engineer has approved a lane closure for the Contractor to perform work within an approved MOT plan.
Percent Within Limits (PWL): That amount of material or workmanship that has been determined, by statistical method, to be within the pre-established characteristic boundary(ies).
Qualified Laboratory: A laboratory mutually agreed upon by both DAPA and the Engineer as having proper test equipment that has been calibrated in accordance to AASHTO.
Qualified Technician: Personnel mutually agreed upon by both DAPA and the Engineer as having adequate training, experience, and abilities to perform the necessary testing. The minimum qualifications are either a recognized nationally accredited or certified Superpave testing certificate or been working in hot-mix asphalt testing for at least one year.
Quality Assurance (QA): All those planned and systematic actions necessary to provide adequate confidence that a product or service will satisfy given requirements for quality.
Quality Control (QC): The sum total of the activities performed by the Contractor in order to assure that the product meets contract requirements.
Quality Control (QC) Plan: The detailed description of the type and frequency of inspection, sampling, and testing deemed necessary to measure and control the various properties governed by the Specifications. The QC Plan must address the actions needed to keep the process in control, detect when the process is going out of control, and responses to correct the situation(s).

Quality Level Analysis: A statistical procedure that provides a method for estimating the percentage of each lot or sublot of material, product, item of construction, or completed construction that may be expected to be within specified tolerances.
Standard Deviation: A term used in statistics to indicate the value calculated from the square root of the difference between the individual measurements in a group and their average. Standard deviation is calculated by taking the square root of the sum of the squares of the differences of each of n values and the mean value, this sum first divided by (n-1).
Target Value: The acceptable value for a controlling characteristic of a product. The JMF will establish each of these values for the material.
Test Methods: Shall be AASHTO test methods. Copies of these test methods shall be available at each qualified laboratory.
Upper Quality Index (QU): The index reflecting the statistic related to the upper boundary to which a sample (or sample statistic) may deviate from the target value and still be considered acceptable.
Volumetric Properties: Air voids, voids in mineral aggregates (VMA), voids filled with asphalt (VFA), and dust to effective asphalt.

.03 Equipment.

(a) Material Production Test Equipment.

The Contractor shall establish, maintain, and operate a qualified testing laboratory at the production plant site of sufficient size and layout that will accommodate the testing operations of both the Contractor and the Engineer. The Contractor shall maintain all the equipment used for handling, preparing, and testing materials in proper operating condition. For any laboratory equipment malfunction, the Contractor shall remedy the situation within one working day or the Engineer may reject production. In the case of an equipment malfunction, and while waiting for repairs to equipment, the Engineer may elect to test the material at either another production facility or the Engineer's laboratory to obtain payment factors.

The following shall be the minimum calibrations for the referenced equipment:

- SUPERPAVE[R] Gyratory Compactor: once every year; verified once every month by the Engineer.
- Ovens: once every three months, verified once every month.
- Vacuum Container and Gauge (Rice Bowls): once every three months, verified once every month.
- Balances and Scales: once every year, verified once every month.
- Thermometers: once a year; verified once every month.
- Gyratory Compactor molds and base plates: once every year
- Mechanical Shakers: once every year
- Sieve Verifications: once every year

All calibrations shall be documented and on file for review by the Engineer at any time.

(b) Pavement Construction Test Equipment.

The Contractor shall furnish and use in-place density gauges, or coring equipment, or both, as necessary to meet the requirements of these Specifications.

.04 Quality Control (QC) Plan.

(a) Material Production QC.

(1) Job Mix Formula – Material Production.

The Contractor shall submit for approval to the Engineer the job mix formula (JMF) design of the component materials and target characteristic values for each mixture proposed for use. Once the JMF is submitted to the Engineer, the Engineer will have up to three weeks to review the submitted information. However, a provision for a more timely approval is available to the Contractor; first, the Contractor shall submit the proper documentation on Pinepave mixture design software for the

Engineer's approval. After that approval from the Engineer, the Contractor shall produce the new mixture for a non-Department project. The Engineer will test the material, by taking three series per the specifications. If the Engineer's test results are within the specifications, then the mixture will be approved by the Engineer for Department projects.

The component materials design shall include designating the source and the expected proportion (within 1 percent for the aggregate components, and within 0.1 percent for the other components) of each component to be used in order to produce workable hot-mix asphalt having the specified properties. For plant component feed adjustments, RAP can be considered in the same manner as an individual aggregate component. The JMF target characteristic values include the mixing temperature range, core temperature range for gyration, the percentage of the asphalt cement component (both total and virgin), and the percentages of the aggregate amounts retained on the sieves to be addressed by the JMF as shown in Table 1.

The Contractor shall provide an ignition oven correction number for each JMF. The Contractor shall also supply to the Engineer weighed material of each JMF so correction numbers can be established for the Engineer's equipment for Dispute Resolution samples.

Prior to starting production of a new mixture, the Contractor shall submit a JMF. For any mixture that has a 20% or greater failure rate on any combined volumetric criteria, the JMF will not be approved for use on Department contracts. In order to be approved, a re-design of the mixture will have to be completed by the Contractor for review and approval by the Engineer. The Contractor shall uniquely title each JMF. The Contractor shall submit test data with each JMF and tests performed by a Qualified Laboratory on representative materials, verifying the adequacy of the design. Refer to the specifications for each mix type in order to determine the design requirements. The JMF sieve percentage values shall conform to the ranges shown in Table 1.

If there is a change in the source of any of the component materials, other than asphalt, if there is a change in the proportions of the aggregate components or the percent passing for each sieve by more than 5 percent from the submitted JMF, or if there is a change in the percentage of the asphalt cement component by 0.2 percent or more, which causes the volumetrics to change from the originally submitted JMF, a new JMF is required. Also, if the asphalt cement target percentage is lowered, all volumetric criteria must still be achieved.

According to the Contractor's QC Plan, the Contractor shall inform the Engineer of any proposed changes to an existing JMF. The Contractor shall notify the Engineer by electronic mail of the proposed changes. The Engineer will reply to the proposed changes within one operational day and notify the Contractor of the effective date of the changes.

Although a new JMF is not required, the Contractor must notify the Engineer of any change in the proportions of the components. This notification shall include the total change made from the approved JMF proportions, and the effective time of the change.

All submitted JMF's shall correspond to the Pinepave mixture design software. The Engineer, for evaluation of the submitted JMF, will use the first three test samples. These test results acquired during production shall be within the following range compared to the submitted JMF on the Pinepave mixture design software: G_{mm}: + / -0.030 and G_{mb}: + / - 0.040

Table 1 - Aggregate Gradation - JMF and Control Point Information

Sieves to be addressed by JMF/Range values are percentages passing by weight

Sieve Size mm (inch)	4.75 mm	4.75mm Range	9.5 mm	9.5mm Range	12.5 mm	12.5mm Range	19.0 mm	19.0mm Range	25.0 mm	25.0mm Range
37.5(1.5)	No		No		No		No		Yes	100
25.0(1.0)	No		No		No		Yes	100	Yes	90-100
19.0 (3/4)	No		No		Yes	100	Yes	90-100	Yes	20-90

Table 1 - Aggregate Gradation - JMF and Control Point Information										
Sieves to be addressed by JMF/Range values are percentages passing by weight										
Sieve Size mm (inch)	**4.75 mm**	**4.75mm Range**	**9.5 mm**	**9.5mm Range**	**12.5 mm**	**12.5mm Range**	**19.0 mm**	**19.0mm Range**	**25.0 mm**	**25.0mm Range**
12.5(1/2)	Yes	100	Yes	100	Yes	90-100	Yes	23-90	Yes	
9.5 (3/8)	Yes	95-100	Yes	90-100	Yes	28-90	Yes		Yes	
4.75(#4)	Yes	90-100	Yes	32-90	Yes		Yes		Yes	
2.36(#8)	Yes		Yes	32-67	Yes	28-58	Yes	23-49	Yes	19-45
(#16)	Yes	30-60	Yes		Yes		Yes		Yes	
(#30)	Yes		Yes		Yes		Yes		Yes	
(#50)	Yes		Yes		Yes		Yes		Yes	
(#100)	Yes		Yes		Yes		Yes		Yes	
.075(#200)	Yes	6-12	Yes	2-10	Yes	2-10	Yes	2-8	Yes	1-7

(2) Process Control – Material Production.

The Contractor shall submit in writing (letter or electronic mail) a QC Plan from each proposed production plant to the Engineer; no hot-mix asphalt material will be accepted until the Engineer approves the QC Plan. This plan must be submitted to the Engineer on an annual basis for review and approval prior to material production. The Engineer will send a signed copy back to the Contractor stating that it is approved. The approved QC Plan shall govern contractor operations.

The following are considered significant violations to the Contractor's QC Plan:

Using testing equipment that is knowingly out of calibration or is not working properly.
Reporting false information such as test data, JMF information, or any info requested by DelDOT
When the Contractor fails to comply to their approved QC Plan in reference to materials testing
Substantial deviations to AASHTO or DelDOT procedures when running tests, sampling stockpiles, or testing hot mix.
The use of any material not listed in the JMF.
The use of the wrong PG graded asphalt.
If samples fall within the Contractors action points in the QC Plan but the Contractor fails to take the corrective action in the approved QC Plan

If a Contractor is found in violation of any of these items, they will receive a written warning for their first violation. If the Contractor is found in violation a second time on any of the criteria, they will forfeit any bonus from that day's production. If the Contractor is found in violation a third time on any of the criteria, they will receive a five percent (5%) deduction for that day's production. If the Contractor is found in violation a fourth time, the plant will not be approved for production until such time that the Contractor addresses the violation of the QC plan to the satisfaction of the Engineer. If the Engineer approves the changes in advance, the Contractor may make changes to the QC Plan. All changes shall be submitted and approved in writing by the Engineer.

The QC Plan shall include actions that will assure all materials and products will conform to the specifications, whether manufactured or processed by the Contractor, or procured from suppliers, subcontractors, or vendors. The Contractor shall perform the inspection and tests required to substantiate product conformance to contract requirements. The Contractor shall document QC inspections and tests, and provide copies to the Engineer when requested. The Contractor shall maintain records of all inspections and tests for at least one year. The records shall include the date, time, and nature of

deficiency or deficiencies found; the quantities of material involved until the deficiency was corrected; and the date, time, and nature of corrective actions taken.

In the QC Plan, the Contractor shall detail the type and frequency of inspection, sampling, and testing deemed necessary to measure and control the various properties of material and construction governed by the Specifications. The QC Plan shall include the following elements as a minimum:

Production Plant – make, type, capacity, and location.
Production Plant Calibration – components and schedule; address documentation.
Personnel – include name and telephone number for the following individuals:
- Person responsible for quality control.
- Qualified technician(s) responsible for performing the inspection, sampling, and testing.
- Person who has the authority to make corrective actions on behalf of the Contractor.

Testing Laboratory – state the frequency of accuracy checks and calibrations of the equipment used for testing; address documentation.
Locations where samples will be obtained and the sampling techniques for each test
Load number of QC samples (1-10 if QA sample is not within trucks 1-10)
Tests to be performed and their normal frequency; the following, at a minimum, shall be conducted:
- Mixture Temperature: each of the first five trucks, and each load that is sampled for QC or acceptance testing.
- Gradation analysis of aggregate (and RAP) stockpiles – one washed gradations per week for each aggregate stockpile; RAP: five gradations and asphalt cement contents for dedicated stockpiles where new material is not being added; one gradation and asphalt cement content test per week for stockpiles where material is continually being added to the stockpile.
- Gradation analysis of non-payment sieves
- Dust to effective asphalt calculation
- Moisture content analysis of aggregates – daily.
- Gradation analysis of the combined aggregate cold feed – one per year per mixture.
- Bulk specific gravity and absorption of blended material – one per year per mixture.
- Ignition Oven calibration – one per year per mixture.
- Hot-Bins: one per year per mixture.
- Others, as appropriate.

Procedures for reporting the results of inspection and tests (include schedule).
Procedures for dealing with non-compliant material or work.
Presentation of control charts. The Contractor shall plot the results of testing on individual control charts for each characteristic. The control charts shall be updated within one working day as test results for each sublot become available. The control charts shall be easily and readily accessible at the plant laboratory. The following parameters shall be plotted from the testing:
- Asphalt cement content.
- Volumetrics (air voids, voids in mineral aggregates [VMA])
- Gradation values for the following sieves:
  - 4.75 mm (#4).
  - 2.36 mm (#8).
  - 0.075 mm (#200).

Operational guidelines (trigger points) to address times when the following actions would be considered:
- Increased frequency of sampling and testing.
- Plant control/settings/operations change.
- JMF adjustment.
- JMF change (See Section .04(a)(1)).
- Change in the source of the component materials.
- Calibration of material production equipment (asphalt pump, belt feeders, etc.).
- Rejection of material.

When any point of non-compliance with the QC plan, or material not meeting the Specifications, comes to the attention of either the Contractor or the Engineer, the other party shall be notified immediately, and the Contractor shall take appropriate corrective actions. Failure to take corrective actions immediately shall be cause for rejection of material or work by the Engineer.

(b) Pavement Construction – Process Control.

The Contractor shall perform Quality Control of pavement compaction by testing in-place pavement with a density gauge or by testing cores extracted from the pavement. The use of the nuclear density gauge shall conform to ASTM D2950; the use of other density gauges shall be as per the manufacturer's recommendations and approved by the Engineer. The Contractor may use any method to select locations for the Quality Control.

.05 Acceptance Plan.

(a) Material Production – Tests and Evaluations.

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. 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 Contractor shall supply, capture, and mark samples, as directed, from delivery trucks before the trucks leave the production plant. 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; if the Contractor visually observes the specified delivery truck sample and does not want this sample to be sampled and tested for acceptance, that delivery truck will not be sent to a Department project. The next visually acceptable delivery truck to the Contractor shall be sampled for acceptance testing.

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. Unacceptable samples may be a basis for rejection of material if the QC plan is not followed as approved for sample retrieval. If the Contractor wishes to perform parallel tests with the Engineer, or to capture samples to be retained for possible Dispute Resolution, each of the samples for these purposes shall be obtained at the same time and location as the acceptance test sample. Either splitting a large sample or getting multiple samples that equally represent the material is acceptable. The Engineer will perform all splitting and handling of samples after they are obtained by the Contractor.

The Engineer will evaluate and accept the material on a lot basis. All the material within a lot shall have the same JMF (mixture ID). The lot size shall be targeted for 2000 tons or a maximum period of three days, whichever is reached first. If the 2000th ton target lot size is achieved during a production day, the lot size shall extend to the end of that production day. The Contractor may interrupt the production of one JMF in order to produce different material; this type of interruption will not alter the determination of the size or limits of material represented by a lot. The Engineer will evaluate each lot on a 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 a mixture samples using a gyratory compactor.
AASHTO T166, Method C (Rapid Method) – Bulk specific gravity of compacted samples.
AASHTO T308 – Asphalt cement content.
AASHTO T30 – Aggregate gradations, using samples from the asphalt cement content test.
AASHTO T209 – Theoretical maximum specific gravity.
ASTM Provisional Test Method – Rapid Drying of Compacted and Loose Bituminous Asphalt Specimens using Vacuum Drying Method

(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 using lots.

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

The exempt areas around manholes will be a maximum of 4 feet transversely on either side from the center of the manhole, and 20 feet longitudinally on either side from the center of the manhole. The exempt areas around driveway entrances shall be the entire width of the driveway, and 3 feet from the edge of the longitudinal joint next to the driveway. Areas of exemption that will be cored for informational purposes only shall 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 **.05 Acceptance Plan (a) Material Production – 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 1.5 feet from the newly placed longitudinal joint and 50 feet from a new transverse joint. If the Contractor chooses to cut companion cores, they shall be located within one foot of the Engineers cores along the longitudinal direction and in-line with the Engineers cores in the longitudinal plane.

Exactly at the locations marked by the Engineer, the Contractor shall cut a core, 6 inches in diameter, through the full lift depth. Cores submitted that are not from the location designated by the Engineer will not be tested and will be paid at zero pay.

The Contractor shall notify the Engineer prior to starting paving operations with approximations of the 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 then have 24 hours to mark the core locations. 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.

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

The Contractor shall cut each core with care in order to prevent damaging the core. The pavement shall have a maximum temperature of 140 F when cores are cut from it. Immediately upon removal of a core from the roadway, the Contractor shall adequately label it. The Contractor shall protect the core by supplying a 6-inch plastic concrete cylinder mold, or an approved substitute, and placing the core in it. If more than one core is in the same mold, the Contractor shall place paper between them. The Contractor shall attach a completed QC test record for the representative area to the corresponding core. The Engineer will also complete a test record for areas tested for the QA report and provide to Materials & Research. At the end of every production day, the Contractor shall deliver the cores to the Engineer for testing, processing, and report distribution.

The Contractor shall repair the core hole per Appendix A, Repairing Core Holes in Hot-Mix 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) – to determine the bulk specific gravity of the cores.
AASHTO T209 – to calculate the theoretical maximum specific gravity and the density of the non-compacted mixtures.
ASTM Provisional Test Method – Rapid Drying of Compacted and Loose Bituminous Asphalt Specimens using Vacuum Drying Method.

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.

.06 Payment and Pay Adjustment Factors.

The Contractor shall 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 hot-mix asphalt. Payment to the Contractor for the hot-mix asphalt item(s) will be based on the Contract price per ton and the pay adjustments described in this specification. The Engineer will determine pay adjustments for the hot-mix asphalt item(s) based on the Acceptance Plan. The Engineer will determine both a pay adjustment for the material and a pay adjustment for the pavement construction. Note that the material portion of the total pay adjustment is 70 percent and the pavement construction portion is 30 percent. For replaced material or work, the Engineer will not apply the Pay Adjustment applicable to the material or work replaced; a new Pay Adjustment will be calculated based on the qualities of the new material. Even if one portion of the pay adjustment (material or construction) is not applied, the Engineer may apply the pay adjustment to the other portion. All adjustments (bonus or penalty) shall be paid under this item number in the contract.

(a) Material Production – Pay Adjustment.

The Engineer will determine the material pay adjustment by evaluating the production material based on the following parameters:

Gradation of the 2.36 mm (#8) sieve.
Gradation of the 0.075 mm (#200) sieve.
Asphalt cement content.
Air void content

Using the JMF target value, the single test tolerance (from Table 3), 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 2 – 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 3 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.
9. For each lot, determine the final material price adjustment:

Final Pay Adjustment =
(Lot Quantity) x (Item Bid Price) x (Pay Adjustment Factor) x 70%. This final pay calculation will be paid to the tenth of a percent.

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. If the PWL of any single material characteristic is below 60, the Engineer may require the removal and replacement of the material at no additional cost to the Department.

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 out of the acceptable tolerance for any Materials pay criteria, 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.

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. If this request is approved, and the Contractor has made a change, the third load after the change will be 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 2 – Quality Level Analysis by the Standard Deviation Method

PU or PL	QU and QL for "n" 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

Table 2 – Quality Level Analysis by the Standard Deviation Method							
PU or PL	**QU and QL for "n" Samples**						
	n = 3	**n = 4**	**n = 5**	**n = 6**	**n = 7**	**n = 8**	**n = 9**
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
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 3 - Material Parameter Weight Factors		
Material Parameter	**Single Test Tolerance (+/-)**	**Weight Factor**
Asphalt Content	0.4	0.30
#8 Sive (19 mm or >)	7.0	0.30
#8 Sieve (12.5 mm or <)	5.0	0.30
#200 Sieve (0.075 mm) Sieve	2.0	0.30
Air Voids (4.0% Target)	1.5	0.10

Table 4 - PWL Pay Adjustment Factors	
PWL	**Pay Adjustment Factor (%)**
100	+5
99	+4
98	+3
97	+2
96	+1
95	0
94	(-1)
93	(-2)
92	(-3)
91	(-4)
PWL (when <91)	(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. Note that the material portion of the total pay adjustment is 70 percent and the pavement construction portion is 30 percent.

1. Calculate the average density values from the sublot tests values, to the nearest 0.1 unit.
2. Calculate the Degree of Compaction:
   Degree of Compaction =
   ((Core Bulk Specific Gravity) / (Theoretical Maximum Specific Gravity)) x 100%.
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 to the 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:
   Pay adjustment = (Lot Quantity) x (Bid Price) x (Pay Adjustment Factor) x 30%.

Table 5: Compaction Price Adjustment Highway Locations	
Degree of Compaction (%)	**Pay Adjustment Factor (%)**
>97	-100*
96	-3
95	0
94	0
93	+5
92	0
91	-15

Table 5: Compaction Price Adjustment Highway Locations	
Degree of Compaction (%)	**Pay Adjustment Factor (%)**
90	-25
89	-30
≤88	-100*

* or remove and replace it at Engineer's discretion

Table 5a: Compaction Price Adjustment Other[1] Locations	
Degree of Compaction (%)	**Pay Adjustment Factor (%)**
>96	-100*
95	-2
94	0
93	+3
92	0
91	0
90	0
89	-1
88	-5
87	-15
86	-25
85	-30
84	-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.

.07 Dispute Resolution.

Disputes or questions about any test result shall be immediately brought to the attention of the Contractor and the Engineer. When there is a significant alleged discrepancy regarding the Engineer's acceptance test results, the Contractor must claim a dispute within two operational days of the test date. 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.

For third party resolution testing, it can be either at 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 Contractor properly captured, labeled, and stored, as described in the second

paragraph of the section of these specifications titled **.05 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. If the Dispute Resolution sample substantiates the original acceptance test result, the Contractor, after two such Dispute Resolution samples, will be charged a fee of $125 for all further Dispute Resolution cores that substantiate the acceptance test result. If the Dispute Resolution sample substantiates the Contractor's test result, the Contractor will not be charged a 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.

7/28/11

Appendix A - Repairing Core Holes in Hot-Mix Asphalt Pavement

Description.

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

Materials and Equipment.

The following material shall be available to complete this work:

Patch Material –A 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 – Shall be mechanical, with a flat, circular tamping face smaller than 6 inches in diameter. The tamping head shall be connected to an electrical, pneumatic, or gasoline driven tamping device.

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. 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 Hot-Mix 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

Existing Material	Structural Coefficient
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

401800 - WMA, SUPERPAVE, TYPE C, 115 GYRATIONS, PG 64-22 (CARBONATE STONE)
401801 - WMA, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 64-22 (CARBONATE STONE)
401802 - WMA, SUPERPAVE, TYPE C, 205 GYRATIONS, PG 64-22 (CARBONATE STONE)

401803 - WMA, SUPERPAVE, TYPE C, 115 GYRATIONS, PG 70-22 (CARBONATE STONE)
401804 - WMA, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 70-22 (CARBONATE STONE)
401805 - WMA, SUPERPAVE, TYPE C, 205 GYRATIONS, PG 70-22 (CARBONATE STONE)

401806 - WMA, SUPERPAVE, TYPE C, 115 GYRATIONS, PG 76-22 (CARBONATE STONE)
401807 - WMA, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 76-22 (CARBONATE STONE)
401808 - WMA, SUPERPAVE, TYPE C, 205 GYRATIONS, PG 76-22 (CARBONATE STONE)

401809 - WMA, SUPERPAVE, TYPE B, 115 GYRATIONS, PG 64-22
401810 - WMA, SUPERPAVE, TYPE B, 160 GYRATIONS, PG 64-22
401811 - WMA, SUPERPAVE, TYPE B, 205 GYRATIONS, PG 64-22

401812 - WMA, SUPERPAVE, TYPE B, 115 GYRATIONS, PG 70-22
401813 - WMA, SUPERPAVE, TYPE B, 160 GYRATIONS, PG 70-22
401814 - WMA, SUPERPAVE, TYPE B, 205 GYRATIONS, PG 70-22

401815 - WMA, SUPERPAVE, TYPE B, 115 GYRATIONS, PG 76-22
401816 - WMA, SUPERPAVE, TYPE B, 160 GYRATIONS, PG 76-22
401817 - WMA, SUPERPAVE, TYPE B, 205 GYRATIONS, PG 76-22

401818 - WMA, SUPERPAVE, BITUMINOUS CONCRETE BASE COURSE, 115 GYRATIONS, PG 64-22
401819 - WMA, SUPERPAVE, BITUMINOUS CONCRETE BASE COURSE, 160 GYRATIONS, PG 64-22
401820 - WMA, SUPERPAVE, BITUMINOUS CONCRETE BASE COURSE, 205 GYRATIONS, PG 64-22

401821 - WMA, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 64-22, PATCHING
401822 - WMA, SUPERPAVE, TYPE B, 160 GYRATIONS, PG 64-22, PATCHING
401823 - WMA, SUPERPAVE, BITUMINOUS CONCRETE BASE COURSE, 160 GYRATIONS, PG-64-22, PATCHING

401824 - WMA, SUPERPAVE, TYPE C, 160 GYRATIONS, PG-64-22, WEDGE
401825 - WMA, SUPERPAVE, TYPE B, 160 GYRATIONS, PG-64-22, WEDGE

401826 - WMA, SUPERPAVE, TYPE C, 115 GYRATIONS, PG 64-22, (NON-CARBONATE STONE)
401827 - WMA, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 64-22, (NON-CARBONATE STONE)
401828 - WMA, SUPERPAVE, TYPE C, 205 GYRATIONS, PG 64-22, (NON-CARBONATE STONE)

401829 - WMA, SUPERPAVE, TYPE C, 115 GYRATIONS, PG 70-22, (NON-CARBONATE STONE)
401830 - WMA, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 70-22, (NON-CARBONATE STONE)
401831 - WMA, SUPERPAVE, TYPE C, 205 GYRATIONS, PG 70-22, (NON-CARBONATE STONE)

401832 - WMA, SUPERPAVE, TYPE C, 115 GYRATIONS, PG 76-22, (NON-CARBONATE STONE)
401833 - WMA, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 76-22, (NON-CARBONATE STONE)
401834 - WMA, SUPERPAVE, TYPE C, 205 GYRATIONS, PG 76-22, (NON-CARBONATE STONE)

401835 - THIN WMA, SUPERPAVE, TYPE C, 115 GYRATIONS, PG 64-22
401836 - THIN WMA, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 64-22
401837 - THIN WMA, SUPERPAVE, TYPE C, 115 GYRATIONS, PG 70-22
401838 - THIN WMA, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 70-22
401839 - THIN WMA, SUPERPAVE, TYPE C, 115 GYRATIONS, PG 76-22
401840 - THIN WMA, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 76-22

Description:

Warm mix asphalt (WMA) is the generic term used to describe the reduction in production, paving, and compaction temperatures achieved through the application of one or more WMA technologies.

WMA may be produced by one or a combination of several technologies involving asphalt foaming processes and equipment or additives that facilitate the reduction of the temperature at which the mix can be placed and satisfactorily compacted thereby permitting the mix to be produced at reduced temperatures from a comparable mix without the Warm Mix Technology.

The following Subsections of the Standard Specifications shall be applicable: 401.01, 401.03 - 401.10, 401.12, and 401.13. All other subsections have been modified herein.

The Contractor shall read and thoroughly understand the requirements of the QA/QC specification as defined in item 401699. It is the responsibility of the Contractor to determine all costs associated with meeting these requirements and to include them in the per ton bids for the various Superpave bituminous concrete items. The Contractor shall also be aware that the pay adjustment factors in item 401699 will be applied to the Superpave item payments to determine the bonus or penalty for the item.

Materials:

If the Contractor proposes to use a combination of materials that are not covered by this Specification, the mix design shall be submitted and reviewed by the Engineer 30 calendar days prior to use.

Conform to the requirements of Subsections 823.01, 823.05- 823.17, and 823.25 - 823.28 of the Standard Specifications and the following for bituminous materials:

Asphalt Binder:

The asphalt binder shall meet the requirements of Superpave performance-grade asphalt binder, as referenced in the Plans, according to M 320 [1], Table 1 and tested according to AASHTO R29 with the following test ranges:

TEST PROCEDURE	AASHTO REFERENCE	SPECIFICATION LIMITS
Temperature, °C	M 320	Per Grade
Original DSR, G*/sin (δ)	T 315	1.00 - 2.20 kPa
RTFO DSR, G*/sin (δ)	T 315	>/= 2.20 kPa
PAV DSR, G* sin (δ)	T 315	</=5000 kPa
BBR Creep Stiffness, *S*	T 313	</= 300.0 kPa
BBR *m*-value	T 313	>/=0.300

Note 1: The exception to M 320 is that the original DSR shall be 1.00 to 2.20 kPa

Substitution of a higher temperature grade will require prior approval by the Engineer.

The highest low temperature grade virgin binder to be used is -22.

Depending on the level of RAP used, the low temperature properties, per T 313, may be different than stated in M 320 or the previous table.

Recycled Materials:

The percentage allowance of recycled asphalt pavement shall be controlled through the use of the Materials & Research recycled mixture program available through the Materials & Research Section. The program can be used by the Contractor to determine which materials and combinations of materials can be used to meet the specified material on the contract.

No recycled asphalt shingles shall be used in WMA.

Mineral Aggregate:

Conform to Section 805 and the following criteria. These criteria apply to the combined aggregate blend.

Design ESAL's (Millions)	Coarse Aggregate Angularity[1] (% Min)		Fine Aggregate Angularity[2] (% Min)		Clay Content[3] (% - Min)	Flat and Elongated [4] (% - Max)
	≤ 100 mm	> 100 mm	≤ 100 mm	> 100 mm		
< 0.3	55/-	-/-	-	-	40	-
0.3 to < 3	75/-	50/-	40	40	40	10
3 to <10	85/80[5]	60/-	45	40	45	
10 < 30	95/90	80/75	45	40	45	
30	100/100	100/100	45	45	50	

[1]Coarse Aggregate Angularity is tested according to D5821.
[2]Fine Aggregate Angularity is tested according to TP33.
[3]Clay Content is tested according to T176.
[4]Flat and Elongated is tested according to D4791 with a 5:1 aspect ratio.
[5] 85/80 denotes that 85% of the coarse aggregate has one fractured face and 80% has two or more fractured faces.

The following source properties apply to the individual aggregates in the aggregate blend for the proposed JMF.

Test Method	Specification Limits
Toughness, T96 Percent Loss, Maximum	40
Soundness, T104 Percent Loss, Maximum for five cycles	20
Deleterious Materials, T112 Percent, Maximum	10
Moisture Sensitivity, T283 Percent, Minimum	80

Supply all polish values to the Engineer upon request. The polish value of the composite aggregate blend for any roadway with a minimum average daily traffic volume (ADT) of 8000 vehicles and a posted speed of 35 mph (60 kph) or greater shall be greater than 8.0 when tested according to Maryland State Highway Administration 'MSMT 411 - Laboratory Method of Predicting Frictional Resistance of Polished Aggregates and Pavement Surfaces'. RAP shall be assigned a value of 4.0.

Mineral Filler:

Conform to M17.

Warm Mix Additives:

For any WMA technology requiring addition of any material by the producer during production, the following information will be submitted with the proposed JMF for review and approval at least 30 calendar days prior to production:

1. WMA technology and/or additive information.
2. WMA technology manufacturer's recommendation for usage.
3. WMA technology target dosage rate and tolerance envelope. Support tolerance envelope with test data demonstrating acceptable mix production properties conforming to all sections of this specification.
4. WMA technology manufacturer's material safety data sheets (MSDS).
5. Documentation of past WMA technology field application including points of contact.
6. Temperature ranges for mixing and compacting.
7. Laboratory test data, samples, and sources of all mix components, and asphalt binder viscosity-temperature relationships.

The contractor shall follow the manufacturer's recommendation for incorporating additives and WMA technologies into the mix. The contractor shall also comply with the manufacturer's recommendation regarding receiving, storage, and delivery of additives.

If the producer performs blending of the WMA technology in their tank, a separate Quality Control plan shall be submitted by the producer to the Department for review and approval at least 30 calendar days prior to production.

Mixture Requirements:

Mix Design. Develop and submit a job mix formula for each mixture according to R35. Each mix design shall be capable of being produced, placed, and compacted as specified. Apply all mix design requirements for Superpave to the development of the WMA mix design.

Gradation: The FHWA Superpave 0.45 Power Chart shall be used to define permissible gradations for the specified mixture. Type C shall be either a No.4 (4.75 mm), 3/8" (9.5 mm), or 1/2" (12.5 mm) Nominal Maximum Aggregate Size Hot-Mix. Unless otherwise noted in the Plans, the Type C shall meet the 3/8" (9.5 mm) Nominal Maximum Aggregate Size. Type B Hot-Mix shall be the 3/4" (19.0 mm) Nominal Maximum Aggregate Size and the Bituminous Concrete Base Course (BCBC) shall be the 1" (25.0 mm) Nominal Maximum Aggregate Size. Target values for percent passing each standard sieve for the design aggregate structure shall comply with the Superpave control points and should avoid the restricted zone. Percentages shall be based on the washed gradation of the aggregate according to T11.

Thin WMA, Type C shall be a No. 4 (4.75 mm) Nominal Maximum Aggregate Size Only.

In addition to the results of the material requirements specified above, the following material properties shall be provided by the Contractor: bulk specific gravity $G_{sb,}$ apparent specific gravity G_{sa}, and the absorption of the individual aggregate stockpiles to be used, tested according to T84 and T85 and reported to three decimal places along with the specific gravity of the mineral filler to be used, tested according to T100 and reported to three decimal places.

Superpave Gyratory Compactive (SGC) Effort:

The Superpave Gyratory Compaction effort employed throughout mixture design, field quality control, or field quality assurance shall be as indicated below. All mixture specimens tested in the SGC shall be compacted to N_{Max} Height data provided by the SGC shall be employed to calculate volumetric properties at $N_{INITIAL}$, N_{DEISGN}, and N_{MAX}

Superpave Gyratory Compactive (SGC) Effort:

DESIGN TRAFFIC LEVEL (MILLION ESAL'S)	$N_{INITIAL}$	N_{DESIGN}	N_{MAX}
0.3 to < 3	7	75	115
3 to < 30	8	100	160
30	9	125	205

Volumetric Design Parameters. The design aggregate structure at the target asphalt cement content shall satisfy the volumetric criteria below:

DESIGN ESAL'S (MILLION)	REQUIRED DENSITY (% OF THEORETICAL MAXIMUM SPECIFIC GRAVITY)			VOIDS-IN-MINERAL AGGREGATE (% - MINIMUM) NOMINAL MAX. AGGREGATE (mm)					VOIDS FILLED WITH ASPHALT (% - MINIMUM)
	$N_{INITIAL}$	N_{DESIGN}	N_{MAX}	25.0	19.0	9.5	12.5	4.75	
0.3 to < 3	≥ 90.5	96.0	≤ 98.0	12.5	13.5	15.5	14.5	16.5	65.0 - 78.0
3 to < 10	89.0								65.0 - 75.0[1]
10 < 30									
30									

Air voids (V_a) at N_{design} shall be 4.0% for all ESAL designs. Air voids (V_a) at N_{max} shall be a minimum of 2.0% for all ESAL designs

The dust to effective binder ratio for the mix having aggregate gradations above the Primary Control Sieve (PCS) Control Points shall be 0.6-1.2. For aggregate gradations below the PCS Control Points, the dust to binder ratio shall be 0.8-1.6. For the No. 4 (4.75 mm) mix, the dust to binder ratio shall be 0.9-2.0 whether above or below the PCS Control Points.

For 3/8" (9.5 mm) Nominal Maximum Aggregate Size mixtures, the specified VFA range shall be 73.0% to 76.0% and for 4.75 mm Nominal Maximum Size mixtures, the range shall be 75 % to 78% for design traffic levels 3 million ESALs.

<u>Gradation Control Points</u>:

The combined aggregates shall conform to the gradation requirement specified in the following table when tested according to T11 and T27.

Nominal Maximum Aggregates Size Control Points, Percent Passing										
	25.0 mm		19.0 mm		12.5 mm		9.5 mm		4.75 mm	
SIEVE SIZE	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
37.5 mm	100	-	-	-	-	-	-	-	-	-
25.0 mm	90	100	100	-	-	-	-	-	-	-
19.0 mm	-	90	90	100	100	-	-	-	-	-
12.5 mm	-	-	-	90	90	100	100	-	100	-
9.5 mm	-	-	-	-	-	90	90	100	95	100
4.75 mm	-	-	-	-	-	-	-	90	90	100
2.36 mm	19	45	23	49	28	58	32	67	-	-

Nominal Maximum Aggregates Size Control Points, Percent Passing										
	25.0 mm		19.0 mm		12.5 mm		9.5 mm		4.75 mm	
SIEVE SIZE	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
1.18 mm	-	-	-	-	-	-	-	-	30	60
0.075 mm	1	7	2	8	2	10	2	10	6	12

Note: The aggregate gradation for each sieve must fall within the minimum and maximum limits.

Gradation Classification:

The Primary Control Sieve (PCS) defines the break point of fine and coarse mixtures. The combined aggregates shall be classified as coarse graded when it passes below the Primary Control Sieve (PCS) control point as defined below. All other gradations shall be classified as fine graded.

PCS CONTROL POINT FOR MIXTURE NOMINAL MAXIMUM AGGREGATES SIZE (% PASSING)					
Nominal maximum Aggregates Size	25.0 mm	19.0 mm	12.5 mm	9.5 mm	4.5 mm
Primary Control Sieve	4.75 mm	4.75 mm	2.36 mm	2.36 mm	1.18 mm
PCS Control Point	40	47	39	47	30-60

Plant Production Tolerances:

Volumeric Property	Superpave Criteria
Air Voids (V_a) at (%) N_{max} Air Voids (V_a) at N_{design} (%)	2.0 (min) 5.5 (max)
Voids in Mineral Aggregate (VMA) at N_{design} 25.0 mm Bituminous Concrete Base Course 19.0 mm Type B Hot-Mix 12.5 mm Type C Hot-Mix 9.5 mm Type C Hot-Mix 4.5 mm Type C Hot-Mix	 -1.2 +2.0

Design Evaluation:

The contractor shall furnish a Job Mix Formula (JMF) for review and approval. The Engineer may elect to evaluate the proposed JMF and suitability of all materials. All materials requested by the Engineer shall be provided at the contractor's expense to the Central Laboratory in Dover in a timely manner upon request. To verify the complete mixture design and evaluate the suitability of all materials, the following approximate quantities are required:

5.25 gal (20 liters) of the asphalt binder;
0.13 gal (0.5 liters) sample of liquid heat-stable anti-strip additive;
254 lb. (115 kg) of each coarse aggregate;
154 lb. (70 kg) of each intermediate and fine aggregate;
22 lb. (10 kg) of mineral filler; and
254 lb. (115 kg) of RAP, when applicable.

The proposed JMF shall include the following:

Plot of the design aggregate structure on the FHWA Superpave 0.45 power chart showing the maximum density line, Superpave control points, and recommended restricted zone.

Plot of the three trial asphalt binder contents at ±0.5% gyratory compaction curves where the percent of maximum specific gravity (% of G_{mm}) is plotted against the log base ten of the number of

gyrations (log (N)) showing the applicable criteria for $N_{initial}$, N_{design}, and $N_{max.}$

Plot of the percent asphalt binder by total weight of the mix (P_b) versus the following:

% of G_{mm} at N_{design}, VMA at N_{desgin}, VFA at N_{design}, Fines to effective asphalt binder (P_{be}) ratio, and unit weight (kg/m²) at both N_{design} and N_{max}.

Summary of the consensus property standards test results for the design aggregate structure, summary of the source property standards test results for the individual aggregates in the design aggregate structure, target value of the asphalt binder content, and a table of G_{mm} of the asphalt mixture for the four trial asphalt binder contents determined according to T209.

The JMF shall also include the NCAT Ignition Oven calibration for the specific materials utilized for this mix.

Construction:

Production Plants. The contractor shall modify and/or operate their production plant as required by the manufacturer to introduce the WMA technology.

Weather Limitations. Place mix only on dry, unfrozen surfaces.

The minimum ambient temperature shall be 32 degrees F.

The following table of ambient temperatures for various binder grades and lift thicknesses for placement with the following parameters:

- Minimum surface temperature of 32 degrees F
- Maximum production temperature of 275 degrees F
- Maximum wind speed of 8 miles per hour

Lift Thickness (in)	PG Binder		
	76-22	70-22	64-22
1.50	50F	45F	40F
2.00	40F	38F	35F
3.00	32F	32F	32F

Construction outside of these conditions will be at the discretion of the Engineer.

Compaction:

Compaction shall be tested and paid per Item 401699 - Quality Control/Quality Assurance of Bituminous Concrete .05 (b) Pavement Construction - Tests and Evaluations.

Method of Measurement and Basis of Payment:

Method of Measurement and Basis of Payment will be in accordance with Subsections 401.14 and 401.15 of the Standard Specifications.

The item 401699, will define adjustment factor to be applied to the bituminous concrete payments for bonus or penalty.

9/6/11

602510 - CONCRETE CULVERT

Description:

This work shall consist of the fabrication, delivery and installation of a precast concrete culvert and wingwalls at the South Parking Lot.

Materials:

Graded aggregate base course: Section 302.

Concrete: Section 602, Class A, 4500 psi.

Bar reinforcement: Section 604.

Frame and grates: Section 708.

Stainless steel dowels: ASTM A276, Type 304.

Construction Methods:

Methods of construction shall be in conformance with the applicable sections of the Standard Specifications.

Method of Measurement:

Concrete Culvert will not be measured.

Basis of Payment:

The quantity of Concrete Culvert will be paid for at the Contract lump sum. The payment will be full compensation for fabrication, delivery and installation of the precast culvert and wingwall structures, drainage grates, for excavation and backfill, graded aggregate base course, and for all materials, labor, tools, equipment and incidentals necessary to complete the work.

2/18/13

602512 - REINFORCED CONCRETE WALL

Description:

This item shall consist of constructing a reinforced concrete walls conforming to the configurations, sizes and dimensions as shown on the plans and these specifications. Reinforced concrete wall shall be constructed at the locations, lines and grades as indicated on the plans making special note of the details specified on the wall faces and special circular endings to certain walls.

Materials and Construction Methods:

The reinforced concrete wall shall conform to the applicable requirements of the following sections of the Standard Specifications:

Section No. Description
207 Excavation and Backfill for Structures
210 Furnishing Borrow Type "C" for Pipe, Utility, Trench, and Structure Backfill
602 P.C.C. Masonry
603 Bar Reinforcement

Construction details/finishes:
Shadow Lines:

a. Top of wall – A shadow line groove is located along the exposed face of each freestanding concrete wall. Walls that are retaining shall only have the groove line on the exposed side. Cheek walls will not have any shadow line grove.
b. Bottom of wall – All freestanding concrete retaining walls shall have a shadow line as noted on the plans. Care should be taken so the correct elevation is established on the forms such that the adjacent concrete walkway once poured does not minimize the specified dimension of such. Should the contractor create such a situation the Engineer has the right to request removal of either the wall or adjacent walkway surface.

Radial/Circular End – several of the free standing and retaining walls are designed to have a small circular (18” diameter) ending to the wall. Care should be taken to note on the plans where these locations are and finish the concrete wall surfaces such that they match and are contiguous with the other portions of the wall.

Chamfer – All top of walls, including cheek walls, shall have a chamfered tops (both sides) as noted on the plans.

Surface finish/texture – All exposed concrete wall surfaces shall have a heavy sand-blasted surface texture. No visible form marks shall be permitted. Engineer shall review and approve surface texture finish for the first wall completed and that shall be the model for the remaining work.

Method of Measurement:

The number of linear feet of reinforced concrete wall to be paid for under this item shall be the number of linear feet of reinforced concrete wall constructed in place, completed and accepted, measured horizontally from end to end of top wall.

Basis of Payment:

The number of linear feet of reinforced concrete wall as measured above, shall be paid for at the contract unit price per Linear Foot bid for "Reinforced Concrete Wall", which price and payment shall constitute full compensation for all cribbing, shoring, sheeting, compaction, formwork, concrete reinforcement, concrete surface finishing and material, labor, equipment, tools and all other incidentals required to complete the work.

602615 - MODULAR BLOCK RETAINING WALL

Description:

This work consists of furnishing all materials and constructing a modular block retaining wall in accordance with the locations, notes, details on Plans and as directed by the Engineer.

Acceptable modular block retaining walls are:

1. "Pisa2" Retaining Wall System as manufactured by Unilock, 229 Route 541 Bypass, Lumberton, NJ 08048 (Telephone 609-914-0000).

2. "AB Classic" from the AB Collection, as manufactured by Allan Block Corporation, 5300 Industrial Blvd., Suite 100, Edina, MN 55439 (Telephone 1-952-835-5309).

3. Or approved equal as approved by the Engineer.

Working Drawings:

General. Submit an acceptable preliminary conceptual design within 14 total calendar days from award date to the Department. Furnish, at no expense to the Department, detailed design engineering calculations, construction drawings, and erection methods. Provide approved drawings using DelDOT drafting standards.

Include the following information on the drawings: type of wall, location, length, top elevation(s), proposed bottom of footing or leveling pad elevations(s), modular blocks, existing utility locations and utility test hole documentation for test holes completed by the Contractor, and cross sections including backfill material type and limits, and quantities. Also show, as required, any details for parapets, coping, barriers, conduit, other attachments to the wall, and/or adjacent barriers or fences. Show complete layout plans and fabrication details, including reinforcement and attachments, for the modular blocks, footings or leveling pads, and step by step erection instructions.

Any fabrication done before acceptance of the drawings will be at the Contractor's risk.

All design information shown on the Contract Plans is conceptual. The proprietary wall vendor takes full responsibility for the engineering theory and calculations, including internal and global stability, and ensuring that tall design assumptions are presented in their drawings and specifications.

Any delay in submission and acceptance of a proposed design will not extend the Contract time.

Experimental or demonstration-type design concepts; or products, structures, or elements not approved by the Department for general usage, will not be permitted in the alternate design.

Show, on the design, the seal of a P.E. registered in the State of Delaware, a valid signature in ink, the date signed, a business name, and a business address.

Perform required design of the retaining wall in accordance with 2007 AASHTO LRFD Bridge Design Specifications 4th Edition with current interims, and the DelDOT Bridge Design Manual with current interims, unless otherwise indicated or specified. Current design practice includes the use of all applicable codes and Department design specifications, publications, policies, and procedures in effect on the date bids are opened.

Materials and Construction Methods:

At the time of submitting the shop drawings, the Contractor shall also submit for approval the material requirements and construction methods for the modular block retaining wall.

Method of Measurement:

The quantity of modular block retaining wall will be measured as the actual number of square feet of vertical wall surface above the footing or foundation material along the front face of the wall.

Basis of Payment:

The quantity of modular block retaining wall will be paid for at the Contract unit price per square foot. Price and payment will constitute full compensation for furnishing all materials, excavation, footing, if required, backfill, drainage pipe, filter fabric, hauling, fabrication and erection, for all labor, tools, equipment and incidentals necessary to complete the work. Utility test holes necessary to complete the shop drawings will be paid for separately.

2/18/13

602668 - PORTLAND CEMENT CONCRETE STAIRS

Description:

This item shall consist of constructing a reinforced portland cement concrete stairs conforming to the configurations, sizes and dimensions as shown on the plans and these specifications.

Reinforced concrete wall shall be constructed at the locations, lines and grades as indicated on the plans.

Materials and Construction Methods:

The reinforced concrete wall shall conform to the applicable requirements of the following sections of the Standard Specifications:

Section No. Description
207 Excavation and Backfill for Structures
602 P.C.C. Masonry
603 Bar Reinforcement

Fabrication:

Casting shall be done in rigidly constructed forms designed to produce dimensionally correct members with uniform surfaces per drawings.

Provide finished edges, which are straight or uniformly radial as noted on the plans, true to size and shape, and within specified casting tolerances. Radial stairs that exhibit anything other than a uniformly smooth radial edge will be subject to rejection by the Engineer.

Make exposed edges sharp, straight, radial, and square. Make flat surfaces into a true plane with directional washes as noted on plans.

Stair shadow lines grooves shall be clean and a consistent dimension as noted on the drawings.

Curing:

Form curing by moisture retention until concrete reaches adequate strength for removal of product from forms, a minimum of 3,500 psi.

Method of Measurement:

The number of square tread feet of reinforced concrete stairs to be paid for under this item shall be the number of square surface tread feet of reinforced concrete stairs constructed in place, completed and accepted, measured horizontally along the center of the stair from end to end of each stair.

Basis of Payment:

The number of linear feet of reinforced Portland cement stairs as measured above, shall be paid for at the contract unit price per Square Foot of tread surface bid for "Portland Cement Concrete Stairs", which price and payment shall constitute full compensation for all shoring, compaction, formwork, concrete reinforcement, concrete surface finishing and material, labor, equipment, tools and all other incidentals required to complete the work.

2/18/13

602772 - MECHANICALLY STABILIZED EARTH WALLS

Description:

This work shall consist of the design and construction of mechanically stabilized earth (M.S.E.) retaining walls in accordance with the AASHTO definitions of mechanically stabilized earth walls employing tensile reinforcements in the soil mass. The M.S.E. retaining wall shall be constructed in conformance with these specifications and to the lines, grades, and dimensions shown on the Plans or as established by the Engineer. Design details for these structures shall be as submitted for approval.

The M.S.E. retaining wall shall be designed in conformance with the 2010 AASHTO LRFD Bridge Design Specifications, 5th Edition including all current Interims and the requirements specified on the Plans.

All retaining wall components shall be designed for a minimum service life of 100 years.

Design Requirements:

The design of the internal stability of the MSE wall shall be the responsibility of the wall manufacturer. Design constraints imposed by external (overall) stability, such as but not limited to, allowable bearing pressure due to the combined effects of vertical and lateral loads. Determining the minimum length of reinforcing elements, as set forth herein, shall be the responsibility of the Contractor.

Working drawings bearing the fabricator's or supplier's title block and design calculations sealed by a professional engineer registered in the State of Delaware shall be submitted for review and approval by the Engineer at least 4 weeks before work is to begin. Working drawings and design calculations shall include the following:

a. Existing ground elevations that have been verified by the Contractor for each location involving construction wholly or partially in original ground.
b. Layout of wall that will effectively retain the earth but not less in height or length than that shown for the wall system in the Plans.
c. Complete design calculations substantiating that the proposed design satisfies the design parameters in the Plans and in the special provisions.
d. Complete details of all elements required for the proper construction of the system, including complete material specifications.

No work or ordering of materials shall commence until approval of the working drawings has been given by the Engineer. Acceptance of the Contractor's working drawings shall not relieve the Contractor of his responsibility under the contract for the successful completion of the work. All work pertaining to Working Drawings for MSE retaining walls shall be done at no additional cost to the Department.

Internal Stability: The internal stability of a mechanically stabilized earth structure shall be the responsibility of the wall supplier. Internal stability issues include, but are not limited to, pullout (or geotechnical) failure of the soil reinforcing elements, tensile failure of the soil reinforcing elements, failure of panel/reinforcement connections, failure through the backfill material within the reinforced mass, and failure along a reinforcing element surface within the reinforced soil mass.

Sliding, overturning, and bearing capacity shall be evaluated by the wall supplier. The allowable bearing capacity at the MSE walls shall be determined by the Contractor and submitted for approval by the Engineer.

Failure Plane: The so-called failure plane shall be taken as coincident with the locus of the points of maximum tensile force which separates the reinforced mass into an active zone between the face of the wall and the line of maximum tensile forces, and a resistant zone behind the maximum tensile forces line. The location of the so-called failure plane shall be adjusted, where necessary, to account for the effects of significant externally applied loads, such as those due to a bridge abutment footing supported directly on

the mechanically stabilized backfill or due to the placement of construction equipment and any lifted loads.

Resistance Factors for Permanent MSE Walls:

0.9 for pullout of tensile reinforcing elements.

1.0 for sliding of the reinforced soil mass along the interface between the reinforced mass and the underlying native soil. The passive resistance of the soil in front of the embedded portion of the wall shall not be included in evaluating lateral stability of the reinforced mass.

0.75 for failure at the facing panel/reinforcing element connection based on the maximum allowable reinforcement tension at the end of the design service life.

Drainage: Drainage shall be as designed by the Contractor or as directed by the Engineer. Internal and external drainage shall be evaluated for all structures to prevent saturation of the backfill or to intercept any surface flows containing aggressive elements such as de-icing salts. Internal drainage of the mechanically stabilized backfill shall be considered where the anticipated rate of surface infiltration due to precipitation exceeds the vertical permeability of the backfill material.

Length of Reinforcing Elements: The length of the reinforcing elements shall be constant over the entire height of any wall section. The minimum reinforcement length shall be as shown on the plans and not less than six (6). In addition, the length of the reinforcing elements shall be sufficient to satisfy all the design criteria with respect to both internal and external stability.

Stresses in Reinforcing Elements: The reinforcing elements shall be designed to have a minimum design life of 100 years with all material and other resistance factors intact at the end of the design life of the mechanically stabilized earth structure.

Unless otherwise approved by the Engineer, the following metal loss rates shall be used in determining the useful area of metal soil reinforcement remaining at the end of the nominal service life:

Loss of Galvanizing (first 2 years):	0.58 mil./year
Loss of Galvanizing (2 years - depletion):	0.16 mil./year
Carbon steel (after zinc depletion):	0.47 mil./year

The allowable tensile stress in the longitudinal wires of the mesh reinforcing elements shall not exceed fifty-five (55) percent of the nominal yield stress of the steel, provided that the yield stress does not exceed 65 kips/sq.in. The maximum tension in any reinforcing element shall not exceed the product of the maximum allowable tensile stress and the area of steel remaining at the end of the nominal service life.

Stresses at Panel/Reinforcement Connections. The horizontal earth pressure used to design the connections and facing panels shall be equal to the maximum horizontal stress computed at each reinforcement level, but in no case shall it be less than eighty-five (85) percent of the maximum horizontal pressure. In the case of rigid panel/reinforcement connections the allowable stress in the reinforcement at the connection shall be reduced to allow for bending stresses induced in the connection due to relative vertical movement between the facing panels and the reinforced backfill.

Internal Horizontal Stresses: For MSE wall systems with quasi-inextensible reinforcing elements, the horizontal stress at each reinforcement level shall be computed by multiplying the corresponding vertical stress by an earth pressure coefficient, K. The vertical stress shall be computed using a layer-by-layer approach following Meyerhof's analysis for eccentrically loaded footings; i.e., the resulting vertical stress at any reinforcement level is a function of the vertical stress due to the self weight of the overlying backfill material and the increase in vertical stress due to the overturning effects of the lateral load from the random fill retained by the mass of reinforced backfill.

The value of the earth pressure coefficient, K, shall be assumed equal to the at-rest (K_o) value at the top of the wall decreasing linearly to the Rankine active value (K_a) at a depth of 20 feet. At depths in excess of 20 feet, the value of K shall be taken as K_a. For normally consolidated soils, $K_o = 1 - \sin\varphi$, where φ is the

angle of shearing resistance of the backfill material. For typical values of φ, K_o may be assumed equal to $1.5K_a$.

Pullout Resistance (Anchorage) Factors: Non-dimensional anchorage factors (denoted as A_c) as determined by laboratory or field pullout tests on reinforcing elements shall be based on the interpreted failure load at a maximum displacement of three-quarters (3/4) of an inch. The anchorage factor, A_c, shall be computed from the expression:

A_c = (Load at 3/4-inch displacement)/$p_v$dbN

where p_v = vertical stress (due to self weight of backfill only) at the reinforcement level, d = diameter of transverse wires, b = width of transverse wires for a 6-inch spacing of longitudinal wires, N = number of transverse wires.

The spacing between transverse wires shall not be less than six (6) inches. The non-dimensional anchorage factor shall be assumed to decrease linearly from 40 at the top of the wall to 15 at a depth of 20 feet. At depths greater than 20 feet the anchorage factor shall be taken equal to 15.

Materials:

The Contractor shall make arrangements to purchase or manufacture the reinforcing mesh or strips, attachment devices, and all other necessary components. Materials not conforming to this section of the specifications shall not be used without written consent from the Engineer.

Steel Reinforcing Mesh. Reinforcing mesh shall be shop fabricated of cold drawn steel wire conforming to the minimum requirements of ASTM A 82 and shall be welded into the finished mesh fabric in accordance with ASTM A 185. Galvanization shall be applied after the mesh is fabricated and conform to the minimum requirements of ASTM A 123.

Steel Reinforcing Strips. Reinforcing strips shall conform to the physical and mechanical properties of ASTM A 572, Grade 65 steel. Galvanizing shall conform to the minimum requirements of AASHTO M111 (ASTM A 123).

Structural Geosythetics shall be made of polypropylene, select high density polyethylene or high-tenacity polyester fibers having a cross-section sufficient to permit significant mechanical interlock with the soil/backfill. Use geosynthetics having a high tensile modulus in relation to the soil/backfill. Use geosynthetics having high resistance to deformation under sustained long term design load while in service and resistant to ultraviolet degradation, to damage under normal construction practices and to all forms of biological or chemical degradation normally encountered in the material being reinforced.

Store the geosynthetics in conditions above 20°F and not greater than 140°F. Prevent mud, wet cement, epoxy, and like materials from coming into contact with and affixing to the goesynthetic material. Rolled geosynthetic may be laid flat or stood on end for storage. Cover the geosynthetic and protect from sunlight prior to placement in the wall system.

Carefully inspect all reinforcement, steel and geosynthetics to ensure they are the proper size and free from defects that may impair their strength and durability.

Filter Fabric (Separation/Retention Fabric). Where required by design, filter fabric shall be placed behind the facing units. Filter fabric shall be woven polypropylene fabric, meeting the requirements of M 288 for a Class I geotextile having an Ultraviolet Stability of 70% strength retention after 500 hours as tested by ASTM D 4355. Slit film geotextile shall not be allowed.

Temporary Support of Embankment. The contractor shall submit to the engineer for approval the anticipated means of Temporary Support of Embankment during the quarantine. The means and methods are to be determined by the contractor. Non-galvanized, welded wire wall is an acceptable means of temporary support.

Backfill. Multiple types of backfill are required for the construction of the MSE walls. All backfill material used in the structure volume shall be free draining, reasonably free from organic or otherwise deleterious materials and shall be as specified on the plans. Metallurgical slag and stone dust are not

acceptable backfill materials. Placement limits are shown on the plans. The material requirements for each backfill type are as follows:

Select Backfill. Select backfill shall conform to the following gradation limits as determined by AASHTO T-27 (ASTM D-422):

Reinforced Backfill	
Sieve Size	Percent Passing
4 inches	100
No. 40	0-60
No. 200	0-15

1. In addition, the select backfill material shall conform to the following requirements:
2. Plasticity Index: The Plasticity Index (P.I.), as determined by AASHTO T- 90 (ASTM D-4318), shall not exceed 6.
3. The material shall be substantially free of shale or other soft, poor durability particles. Testing in accordance with AASHTO T-104 shall be performed to verify a magnesium sulfate soundness loss of less than 30% after four (4) cycles.

Electrochemical Requirements - The backfill materials shall meet the following criteria:

Requirements	Test Methods
Resistivity >3,000 ohm-cm	AASHTO T-288-91
pH 5-10	AASHTO T-289-91
Chlorides <100 parts per million	AASHTO T-291-91
Sulfates <200 parts per million	AASHTO T-290-91
Organic Content <1%	AASHTO T-267-86

If the resistivity is greater than or equal to 5000 ohm-cm, the chloride and sulfates requirements may be waived.

1. The material shall exhibit an angle of internal friction of not less than 34 degrees as determined by the standard direct shear test (AASHTO T-236) on the portion finer than the No. 10 sieve and compacted to 95% of AASHTO T-99 Method C or D (oversized correction) at optimum moisture content.

2. The Contractor shall furnish to the Engineer a Certificate of Compliance certifying that the backfill materials comply with this section of the specifications prior to backfill placement. A copy of all test results performed by the Contractor, which are necessary to assure compliance with the specifications, shall also be furnished to the Engineer. Backfill not conforming to this specification shall not be used without the written consent of both the Engineer and the wall supplier.

Construction Methods:

The selected MSE wall manufacturer shall provide a representative on site at the outset of the wall construction and periodically throughout construction of the wall and at the direction of the Engineer. The wall manufacturer's representative shall be present at a pre-construction conference to provide an overview of the wall system and a detailed construction procedure to the contractor and the Engineer.

Wall Excavation. Excavation shall be in accordance with the requirements of the DelDOT specifications and in reasonably close conformity with the limits shown on the Plans. Temporary excavation support as required shall be the responsibility of the Contractor. The base of the excavation shall be completed to within +/- 3 inches of the staked elevations unless otherwise directed by the Engineer.

Foundation Preparation. The foundation for the structure shall be graded level for a width 1 foot beyond the length of the reinforcement elements or as shown on the Plans. Prior to wall construction, the foundation shall be test rolled under the observation of the Engineer in accordance with Section 202.02.

Any unsuitable foundation material as determined by the Engineer shall be excavated to the determined depth and replaced with Borrow Type B and shall be compacted in accordance with Backfill Placement as described below.

Wall Erection. The wall system components shall be constructed in accordance with the wall system supplier's recommendations and construction manual. The wall shall be constructed vertical and within the specified tolerances. The overall vertical tolerance of the wall and the horizontal alignment tolerance shall not exceed 3/4-inch per 10 feet. Bulging in the vertical or horizontal direction shall be limited to 2 inches as measured from the theoretical wall line. The Engineer shall be notified of any bulging areas that exceed this limit.

Backfill Placement. Backfill placement shall closely follow erection of each course of concrete facing units. Backfill shall be placed in such a manner as to avoid any damage or disturbance to the wall materials or misalignment of the facing. Any wall materials that become damaged or disturbed during backfill placement shall be removed and replaced at the Contractor's expense or corrected as directed by the Engineer. The Engineer will be the sole authority as to the acceptability of any repairs to damaged wall materials. Any misalignment or distortion of the wall elements due to placement of backfill outside the limits of this specification shall be corrected as directed by the Engineer.

Backfill within the zone of soil reinforcements shall be compacted to 95% of the laboratory determined maximum dry density and optimum moisture content, as determined by AASHTO T 99, by at least four (4) passes of a heavy roller having a minimum dynamic force of 20 tons impact per vibration and a minimum frequency of 16 hertz.

The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer. The water content of the wall backfill shall not deviate from the optimum water content by more than 2%. Backfill material with a placement moisture content in excess of the optimum moisture content shall be removed and reworked until the moisture content is uniformly acceptable throughout the entire lift.

The maximum lift thickness after compaction shall not exceed 8 inches regardless of the vertical spacing between layers of soil reinforcements. The Contractor shall decrease this lift thickness as required to obtain the specified density.

Prior to placement of the soil reinforcements, the backfill elevation after compaction within the zone of soil reinforcements shall be 2 inches above the connection elevation from a point approximately 24 inches behind the facing to the free end of the soil reinforcements unless otherwise shown on the Plans.

Compaction within 3 feet of the wall face shall be achieved by at least three (3) passes of a lightweight mechanical tamper, roller or vibratory system. Care shall be exercised in the compaction process to avoid misalignment of the facing. Heavy compaction equipment shall not be used to compact backfill within 3 feet of the wall face. At the end of each day's operation, the Contractor shall slope the last level of backfill away from the wall facing to direct runoff of rainwater away from the wall face. In addition, the Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

Utilities. The contractor shall accommodate the passage of utilities, including drainage inlets and pipes, through the reinforced embankment material or MSE wall if shown on the plans. The soil reinforcements shall be placed to permit the installation and operation of, and access to, the utilities constructed within the embankment while satisfying the design requirements of the MSE wall. The MSE wall manufacturer shall provide a construction sequence for installation of utilities within the reinforced embankment which does not jeopardize the integrity and stability of the reinforced soil mass.

Obstructions in the Reinforced Soil Zone. Where foundation elements interfere with the soil reinforcement, specific methods for field installation must be developed and presented on the plans. The design of the MSE Wall near the obstruction shall be modified using one of the following alternatives:

1. Design reinforcing layers to carry additional loads that would have been carried by reinforcing layers that were partially or fully severed in order to install the obstruction.

2. Place a structural frame around the obstruction capable of carrying the load from the reinforcement in front of the obstruction to reinforcement connected to the structural frame behind the obstruction.
3. If discrete strips are used splay the reinforcement around the obstruction.

Method of Measurement:

The quantity of Mechanically Stabilized Earth Walls will not be measured.

Basis of Payment:

The payment will be full compensation for all components of the MSE Wall and shall include full compensation for designing, fabricating, furnishing, installing, testing and for all excavation, materials, labor, tools, equipment, and incidentals necessary to complete the installation in conformance with the plans and Specifications.

Excavation of unsuitable material will be measured and paid for as described under Standard Specification 207.07, Table 207-A and backfilling with Borrow Type B will be measured and paid for under Item 209002.

2/18/13

606510 - HANDRAIL TYPE I

Description:

This item shall consist of fabricating, finishing, furnishing, and erecting complete in place an aluminum pedestrian railing, in locations shown on drawings, and to the lines and grades shown on the drawings or as ordered by the Engineer. The type of railing and details shall be as shown on the drawings.

Manufacturer's Shop drawings shall be submitted to landscape Architect /Engineer for approval prior to manufacturer.

Materials:

Components:

Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than strength and durability properties of alloy and temper designated below for each aluminum form required. Aluminum posts and rails shall conform to ASTM B117.

Posts: Provide cast aluminum alloy A-356 metal free from pitting, seam marks, roller marks, stains, discolorations, and other imperfections where exposed to view on finished units. ASTM A36/A 36M. Posts shall be the size and configuration as indicated on the drawings.

Rails: Extruded aluminum alloy 6061-T6 grade and weight as required by structural loads ASTM A 53. Rail component lengths shall be cut to correspond to post spacing such that all seams are located directly over a post.

Fasteners, fittings and anchors: All fittings shall be galvanized steel meeting the requirements of ASTM A27.

Welding Electrodes and Filler Metal: Provide type and alloy of filler metal and electrodes as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.

Fasteners for Anchoring Posts and Railings: Select fasteners of type, grade, and class required to produce connections suitable for anchoring posts and railings capable of withstanding design loads. The bolts and washers attaching the post to the concrete base must be isolated from the aluminum post base plate with a nylon top hat washer

Fasteners are to be galvanized and corrosion resistant.

Acorn nuts shall also be tamper resistant.

Grout: Non-shrink, Nonmetallic. Premixed, factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for exterior applications.

Additional Posts: Contractor shall provide to the owner twenty (20) additional posts for future replacement parts should the need occur.

Construction Methods:

General:

Fabricate pedestrian railing to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but never less than that required to support structural loads.

Assemble pedestrian railing in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

Fit exposed connections together to form tight, hairline joints.

Perform cutting, drilling, and fitting required to install pedestrian rails. Set rails accurately in location, alignment, and elevation; measured from established lines and levels and free from rack.

Do not weld, cut, or abrade surfaces of handrail and railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.

Set posts plumb within a tolerance of 1/16 inch in 3 feet.

Pedestrian rails are joined together with extruded aluminum internal splice sleeves as noted on the drawings and fitted with a coiled spring pin. All railing splices shall be located such that they are directly over a post. Type 1 joint (Standard) shall be provided to accommodate movement range up to +/- 3/8".

Do not support pedestrian railing temporarily by any means that does not satisfy structural performance requirements.

Railing Connections:

Fabricate rails by connecting members with concealed mechanical fasteners and fittings, unless otherwise indicated. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

The rails are attached to the supporting posts with two stainless steel set pins located and secured into the rear of the rail with a tapped set screw hole as indicated on the drawings.

Anchoring Posts:

Provide anchorage materials capable of withstanding loads imposed by railing.

Carefully locate location of anchors using template in the construction details.
Core-drill holes in concrete to dimensions recommended by the manufacturer of the expansion anchor being used. Clean holes of loose material.

Insert galvanized steel expansion anchor. Install per manufacturer's recommendations.

Place neoprene spacer over anchor to sit between base of post and concrete substrate.

Plate/post over anchors. Plate/post to be set as to not scratch bottom of plate.

Provide small non metallic washer and tamper resistant galvanized steel acorn nut. Tighten as to keep plate in place but without scratching plate.

Protection:

Protect finishes of pedestrian railing from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at the time of Substantial Completion.

Warranty:

The pedestrian railing shall have a limited 1 year warranty against defects in workmanship and materials.

The finish for the pedestrian railing and gate shall have a limited 10 year warranty against the occurrence of spalling, peeling, cracking, flaking, or blistering due to natural causes.

Method of Measurement:

The quantity of Hand Rail Type I will be measured in linear feet.

Basis of Payment:

The quantity of Hand Rail Type I will be paid for at the Contract unit price per linear foot. Price and payment will constitute full compensation for furnishing and installing posts, rails and for all labor, equipment, tools, and incidentals necessary to complete the work.

2/18/13

614686 - WATER SERVICE SYSTEM

Description:

This work consists of furnishing and installing all water main pipe and fittings, service pipe, restraint devices and/or thrust blocks, valves, hose stations (campsite services), water valve and hose station concrete pads, dump station water towers, shower towers, water spigots, valve boxes, meter pits, pavement removal and replacement, excavation, backfill, compaction, dewatering, completing all connections to existing water main as shown in the Contract Drawings, furnishing all necessary borrow material, proper disposal of all excess material and construction debris and furnishing and installing all services, equipment, materials and labor necessary for the complete and proper installation of the water mains as indicated in the Contract Documents.

All water main construction activity shall be coordinated with utility owner.

Materials:

All water main pipe material shall be Pressure Class 150 psi, molecularly oriented Polyvinyl Chloride (PVC) pipe with mechanical joint or push on ends. The pipe shall be Ultra-Blue CIOD pressure pipe manufactured by Uponor ETI Co., PW Eagle, or approved equal. Pipe shall be manufactured in lengths not to exceed 20 feet and each section shall bear the National Sanitation Foundation seal for potable water carrying pipe. A manufacturer certification shall be furnished in accordance with Section 6.3 of the relevant AWWA specification.

All fittings shall be made of gray or ductile iron in accordance with AWWA C110 or C153. Fittings shall be provided with mechanical joint ends furnished in accordance with AWWA C111. All fitting shall be double cement mortar lined with bituminous seal coat in accordance with AWWA C014.

Gate valves shall be in conformance with AWWA C509, latest addition, and be rated for 250 psi working pressure. Gate valves shall be epoxy coated iron body, with non-rising stems, triple O-ring seals, mechanical joint ends; square nut operated, and shall open by turning counterclockwise. Wrench nut cap screws, stuffing box bolts and nuts and bonnet bolts and nuts shall be type 304 Stainless Steel and shall be factory installed (not as by Contractor in field). Resilient seat gate valves shall have a modified wedge disc and otherwise conform to all applicable AWWA Standards and shall be manufactured by Mueller Co., Model #A-2360, Mueller Co., or Model A2362 (with AquaGrip restrainer),or Kennedy, Model KSII, NRS, or approved equal.

Valve boxes for gate valves shall be two-piece screw type with 5-1/4 inch shafts and No. 6 round bases. Valve boxes shall be adjustable between the limits of 2'-4" and 3'-4". If necessary, the water main shall be lowered to provide adequate depth of installation of the valve box. Lids shall be extra deep with two holes and the word "WATER" cast in the upper surface. Valve box assemblies shall be as manufactured by Tyler Pipe Model 564-S, or East Jordan, Series 8550 or approved equal.

Service piping shall be ultra-high molecular weight polyethylene plastic pipe manufactured in accordance with ASTM D-2239 and AWWA C901 with a maximum dimension ration (SDR of 9). Pipe shall meet the requirements of Type III Class C Category 5-P34 polyethylene as defined in ASTM D-1248 and shall be rated for a 150 psi working pressure at 73.4 degrees F and designed to withstand a hydrostatic stress of 630 psi at the same temperature. The pipe shall be approved by the National Sanitation Foundation for use as a carrier of potable water. Pipe shall have name of manufacturer, pipe size, ASTM specification number and pressure rating permanently imprinted on exterior of pipe wall at minimum intervals of 5 feet. Pipe delivered and stockpiled shall be packaged for protection against dirt and damage and suitably covered to protect the pipe from sunlight.

Polyethylene connections shall be made with cold-flared couplings with AWWA standard inlet threads suitable for connection to polyethylene water service piping. Polyethylene pipe connections shall be as manufactured by Mueller Co., Model #H-15451, or by Ford Meter Box Co., Inc., Model #C14-44Q or approved equal. Connections to PVC water mains shall be as manufactured by Ford Meter Box Co., Inc., Model #FS303 Stainless Steel Saddle, or Power Seal Pipeline Products Corp., Model #3411AS All Stainless Steel Saddle or approved equal.

Restraint devices shall be provided at all bends, tees, plugs, tapping sleeves and fire hydrants. Restrain devices for PVC pipe shall incorporate a series of machined serrations (not as cast) on the inside diameter to provide positive restraint, exact fit, full circle contact and support of the pipe wall. Restraint devices shall be manufactured of high strength ductile iron, ASTM A536, Grade 65-45-12. All Restraint devices for the pipe shall have working pressure ratings equivalent to the full rated pressure of the pipe on which they are installed, with a minimum 2:1 safety factor in any nominal pipe size. Restraint devices for PVC mechanical joint or push-on fittings shall be Uni-Flange Retainer Series UFR 1500-C or EBAA Iron Series 2000 PV or approved equal. Restraint devices for ductile iron mechanical joint or push-on fittings shall be Uni-Flange Retainer Series UFR 1400-D or EBAA Iron Series 1100 or approved equal.

Pipeline detection tape shall be D-Tec Tape as manufactured by Vent-Tech USA, of Richmond, IL, Pro-kote, or approved equal. The tape shall be a minimum of six inches wide, blue in color, imprinted with the words "CAUTION-WATER LINE BELOW".

Portland Cement for thrust blocks and encasements shall conform to ASTM C150 for Type II and shall have a minimum compressive strength of 4000 psi at 28 days, unless otherwise noted on the plans. The use of anti-freeze compounds, salts, chemicals or other foreign materials, for the purpose of lowering the freezing point of the concrete is prohibited. No calcium chloride or ingredients containing chlorides shall be mixed in any concrete.

All concrete (when temperatures are above 55 degrees F) shall have a water reducing and retarding admixture. When temperatures are below 54 degrees F a water reducing admixture shall be used. The water reducing and retarding admixture shall conform to ASTM C494-71 for Type 'D', and the water reducing admixture shall be Type 'A'. This admixture shall be of a non-air entraining type.

Dump Station Water Towers shall be manufactured by Trumbull Recreation Supply – Water Tower: Model FPWT-XL, Tower Company Inc. – Romort Water Tower, RV Park Supplies – RV Dump Station Water Hose, or Approved Equal.

Shower Tower shall be manufactured by Shower Tower Inc. (shall be ADA compliant with 2 high showers on opposite sides, one foot shower, one hose bib), or Approved Equal.

Special Requirements:

The Contractor's attention is directed to the following special requirements.

Shop drawings and/or catalog cuts of pipe, valves, fittings, and hydrants shall be submitted for review/approval. If further information is required, the Contractor shall furnish it immediately.

As-built drawings shall be the Contractor's responsibility. During the progress of work, maintain an accurate record of the location of the piping with reference to job base lines grades and elevations. Show all changes made in the piping installation from the layout and materials shown on the approved shop drawings.

All construction must be performed in compliance with the Occupational Safety and Health Act of 1970, any subsequent amendments and all rules and regulations thereto appurtenant.

The locations of the existing underground structures as indicated on the drawings are approximate only and are based on the best information available at this time. The Contractor shall uncover and support existing underground utilities/structures as necessary at his own expense as part of the Contract. Any damage to existing utilities/structures resulting from the Contractor's activities shall be repaired at the Contractor's expense. Any and all emergency repairs to existing utilities/structures that have been damaged by the Contractor's activities shall be the responsibility of the Contractor. The Engineer will notify the Contractor by telecommunication and the Contractor shall be required to commence the repair immediately. In the event the Engineer is unable to contact the Contractor for immediate emergency repair work in the length of time as determined by the Engineer, the Engineer reserves the right to attend to any and/or all emergency repair work and to submit the costs of repair directly to the Contractor for complete payment.

The Contractor shall guarantee that all work and/or workmanship performed under this Contract shall be in strict accordance with the Contract Documents. This guarantee shall be for a period of two

years from and after the date of completion and acceptance of the work. The Contractor shall repair, correct or replace as required, promptly and without charge, all work, equipment and material, or parts thereof, which fail to meet the above guarantee or which in any way fail to comply with or fail to be in strict accordance with the terms and provisions and requirements of the Contract during such two-year period.

All changes to the design of the water main during construction shall receive approval by the Engineer prior to installation.

If, at any time before the final acceptance of the contract, any broken pipes, or any defects are found in the water mains or in any appurtenances, the Contractor shall cause the same to be removed and replaced by proper material and workmanship, without extra compensation for the labor and material required, even though such injury or damage may not have been due to any act, default or negligence on the part of the Contractor. All materials shall be carefully examined by the Contractor for defects, just before placing, and any found defective shall not be placed in the line.

The Contractor shall be required at his own expense to prevent dust nuisance.

Construction Methods:

All work in connection with construction of water mains shall conform to the applicable requirements of the Standard Specifications of Sussex Shores Water Company and DNREC except as modified by the Plans and these Special Provisions. In case of conflict, the Specifications of utility owner shall prevail.

Pipe Delivery, Storage and Handling – Material delivery, storage and handling shall be executed in accordance with AWWA C-600 and AWWA C-900, "Inspection, Responsibility for Materials and Handling of Material." Pipe, fittings, valves, hydrants and accessories shall be loaded and unloaded by lifting with hoists or skidding so as to avoid shock or damage. Under no circumstances shall such materials be dropped. Pipe handled on skidways shall not be skidded or rolled against pipe already on the ground. Materials shall be stored in such a matter as to prevent damage, water and dirt contact and freezing. Any damaged materials shall be removed from the site at once and replaced.

Excavation and Trenching – Excavation shall be performed in accordance with Section 208 – Excavation and Backfill for Pipe Trenches except as amended herein. Trenches shall be excavated to the necessary width and depth as directed. Trenches under paving and trenches at all points below the top of the pipe to be laid therein shall be in accordance with standard detail drawings. Where sheeting is used, the maximum width below the top of the pipe, as prescribed above, shall be measured between the interior faces of the sheeting as drive, but in no case shall stringers or waling-strips be so placed as to interfere with the proper ramming of the earth under and around the pipe. In case the sheeting does not extend below a point 6-inches above the pipe as laid, the maximum width allowed shall be measured between the faces of the excavation below the bottom of the sheeting.

Trenching on hard surface roads will be permitted only when the hard surface has first been cut for its full depth along the trench lines, by sawcutting.

Materials removed which are to be replaced after the installation of the pipe line or structure, shall be stored in a suitable place and manner until such time as the materials are reused. The Contractor shall replace at his own expense any such materials lost or damaged beyond use by careless or neglectful removal and storage. Sod and toposoil over areas to be excavated or filled may, at the Contractor's option, be striped and stored for reuse, as approved by the Engineer.

No greater length of trench at any location shall be left open in advance of the completed structure placed there in than shall be authorized or directed. The Engineer shall be empowered, to require the refilling or open trenches over completed pipe lines if, in his judgment, such action is necessary. The Contractor shall have no claim for extra compensation even though to accomplish said refilling he is compelled temporarily to stop excavation or other work at any place.

If work is stopped on any trench for any reason except by order of the Engineer and the excavation is left open for an unreasonable length of time in advance of construction, the Contractor shall if so directed, refill such trench at his own cost and shall not again open said trench until he is ready to

complete the structure therein. If the contractor shall refuse or fail to refill such trench completely within forty-eight (48) hours after said notice the Engineer shall be authorized to do the work and the Engineer shall charge the expense thereof to the Contractor and retain the same out of any monies due or to become due to him under the Contract.

The excavation of all trenches shall be fully completed at least twenty (20) feet in advance of pipe laying, unless otherwise authorized or directed by the Engineer.

The Contractor at his own expense, shall keep all excavations free from water below the subgrade of the work while the work is in progress and to such extent as may be necessary while excavation work along is being carried on. He shall build all dams, under drains and other devices necessary for this purpose and provide and operate pumps of sufficient capacity for dewatering the excavations. He/she shall provide for the disposal of the water removed from excavations, in such manner as shall not cause injury to the public health, to public or private property, or to any portion of the work completed or in progress, or any impediment to the use of the streets by the public. The cost of dewatering is to be included in the Lump Sum Bid. The method used to accomplish this dewatering must meet with the Engineer's approval.

Any material encountered during the excavation of any trench which will not consolidate over a reasonable period of time after being replaced in the trench shall be removed from the project site and replaced with material approved by the Engineer. Excavating below subgrade and supplying and placing of imported select fill material shall be included in the Contract Lump Sum Bid Price for Water Service System.

In backfilling trenches in which pipe is laid the earth shall be carefully placed by hand in 6-inch layers and solidly compacting under, around and over the pipe for a depth of at least one (1) foot above the top of the pipe. Such compacting shall be done in a thorough manner with hand rammers made for the purpose and the greatest care shall be exercised so as not to disturb freshly made joints or the alignment of the pipe. The backfill shall be carried up and tamped evenly on both sides of the pipe. After the backfill material has reached the abovementioned height and has been tamped as specified the remainder of the trench may be filled by hand or by machinery at the option of the Contractor. Proper care shall be taken at all times not to injure the pipe line by jarring or by the impact of improperly placed fill material.

All refill material above the level of one foot over the top of the pipe shall be tamped in 8 inch layers to the density of the adjacent undisturbed soil unless otherwise shown, specified or directed. Compaction shall be carried out to achieve a density of at least 95% of the maximum density as determined by AASHTO Method T-191. If a test shows that the actual density in any area is less than that required density the Contractor shall recompact the area represented by the unsatisfactory test result. Recompacted areas shall be subject to retesting at the option of the Engineer. Mechanical tampers shall be capable of exerting a blow equal to two hundred fifty (250) foot pounds per square foot of area of tamping face. Puddling will be allowed only with the written permission of the Engineer.

After completion of refilling all material not used therein, including such earth that cannot be properly rounded up over the refilled excavation, shall be removed and disposed of in such a manner and at such point or points as shall be approved or directed and all roads, sidewalks, and other places on the line of work shall be left free, clean and in good order. Said cleaning-up shall be done by the Contractor without extra compensation and if he shall fail to do such work within reasonable time after receipt of notice it will be performed by the Engineer and the cost shall be retained out of the monies due or to become due to the Contractor under the Contract.

In the event that more material is needed to fill areas as shown on the plans the Contractor shall obtain borrow material from other sources. The obtaining of such borrow excavation shall be the Contractor's responsibility. All borrow excavation shall be of satisfactory quality for the purpose for which it is required.

All fills shall be placed in layers not thicker than eight inches and each layer shall be thoroughly compacted by rolling, tamping, or otherwise as directed by the Engineer. Where directed, water shall be used as required to bring the earth into proper condition for maximum compaction.

Mechanical tampers shall be capable of exerting a blow equal to two hundred-fifty (250) foot pounds per square foot of area of tampering face. One mechanical tamper shall be used for every two hand shovelers.

The excavation, backfill and backfilling shall be included in the lump sum bid.

Installation of Water Main Pipe and Fittings – All pipe, valves, fittings, hydrants and buttresses shall be installed as specified in AWWA standards C-600 and C-900, the pipe manufacturer's recommended methods and as stated herein, unless otherwise specified by the Engineer.

All pipe, valves and fittings shall be thoroughly cleaned and shall be entirely free from grease or oil and substantially free from blacking, dirt, sand, rust, slag or fluxing materials.

All pipes, fittings and valves to be connected by standard mechanical joints shall be installed by experienced pipe layers to the satisfaction of the Engineer. Prior to making up joints the bells, pipe ends and rubber gaskets shall be thoroughly washed with soapy water. A cast iron gland shall be slid over the pipe and followed by a rubber gasket, thoroughly soaped, with its tapered side facing the bell. The pipe shall then be inserted fully into the bell. The rubber gasket shall be forced into position with the fingers until it is flush with the face of the bell, the gland shall be slid against the face of the rubber gasket and the bolts inserted and made finger-tight. Nuts shall be tightened with a torque wrench as specified by the manufacturer and AWWA. Bolts shall be drawn up evenly on alternate sides, beginning at the top, keeping the gland parallel to the face of the bell at all times. In the event the use of ratchet wrenches is permitted, extreme care shall be taken to tighten the nuts to the specified tension without over tightening. Bell hole excavation may be required to allow proper wrench movement.

Push-on joints shall be made up in strict conformance with the manufacturer's recommendations and lubricants.

Pipe and fittings shall be moved to the trench, carefully lowered, and set to line and grade. Pipe shall be laid on the sub-grade as specified under Excavation and Trenching. No blocking will be permitted. No pipe or fitting shall be installed until sufficient trench has been completely excavated to satisfy the Engineer that no unforeseen obstructions of any kind are likely to be encountered. Where it is necessary to raise or lower the pipes due to obstructions or other causes, the Engineer shall be notified and the change in grade shall be effected in accordance with details which will be furnished by the Engineer. In crimping, joint deflections shall not exceed maximum deflections stated by the manufacturer for the specified joint and pipe sizes. No pipe shall be cut, nor cut pipe installed, except at the specific direction of the Engineer. Pipe shall be cut by the Contractor when required without any additional compensation. In cutting, the ends shall be cut at right angles to the axis and the edges filed to a smooth taper. Special care shall be exercised by the Contractor to prevent damage to any pipe. Before placing in the trench, each pipe or fitting shall be carefully cleaned of any foreign substance, which may have collected therein and shall be kept clean at all times thereafter. No pipe shall be laid upon a foundation into which frost has penetrated, nor at any time when the Engineer shall deem that there is a danger of the formation of ice or the penetration of frost at the bottom of the excavation. All requirements regarding the minimum length of open trench and promptness of refilling shall be observed. The open ends of all pipe and fittings in the trench shall be closed to the satisfaction of the Engineer before leaving the work for the night and for all holidays or other times of interruption to the work.

Any excessive settlement of the pipe requiring repairs shall be the sole responsibility of the Contractor (within the limits of the guarantee) and he shall make and do all required work as may be necessary to accomplish the required repairs and return the site to proper condition and appearance, without additional compensation.

Fittings and valves shall be placed along the water mains where shown on the drawings or where designated by the Engineer in accordance with the requirements as provided elsewhere in these specifications.

The Contractor shall furnish and install a valve box for every proposed valve. The valve box shall be carefully placed and set at a right angle to the water main. The valve box shall not transmit shock or stress to the valve and shall be centered and plumb over the wrench nut of the valve, with the box cover flush with the surface of the finished pavement or set to the elevation shown on the drawings. The flange at the bottom of the top section shall rest upon bricks, which shall extend into solid ground on each

side of the trench for a minimum of eight inches. For valve boxes not placed in roadway areas, but in graded areas the top shall be set at the existing finished grade or as directed by the Engineer.

In tamping the backfill around the valve, special care shall be taken to keep the box in place and to have it firmly supported so as to avoid settlement. Any box which is found out of place or which is not firmly supported shall be dug up and reset in a satisfactory manner at the Contractor's expense.

All fittings shall be firmly blocked with concrete against undisturbed earth.

Pipeline detection tape shall have a dual installation: Continuously along all water mains and twelve inches from the ground surface.

If, at any time before the final acceptance of the contract, any broken pipes, or any defects are found in the water mains or in any appurtenances, the Contractor shall cause the same to be removed and replaced by proper material and workmanship, without extra compensation for the labor and material required, even though such injury or damage may not have been due to any act, default or negligence on the part of the Contractor. All materials shall be carefully examined by the Contractor for defects, just before placing, and any found defective shall not be placed in the line.

Water Main Testing - The Contractor shall test complete sections of the underground piping for leakage in accordance with the requirements of Section 4 of the AWWA C600, 2 hour duration.

The Contractor will be permitted to have the pipe trench open at pipe joints until satisfactory completion of the leakage test provided the openings are properly guarded and he/she assumes all risks of damage associated therewith. The portion of trench shall be backfilled immediately after the installation to prevent pipe movement.

The Engineer shall be notified in advance of all tests and will provide an inspector; all tests shall be completed to his entire satisfaction.

The test pressure shall be 100 psi.

The inspection of water main testing indicates pipe leakage, the Contractor shall identify and repair the defect at no additional expense to the Engineer and inspection and/or testing shall be repeated. All repairs shall be made with new material. Failure to meet the tests specified above will be sufficient cause to reject the work until the defects are satisfactorily repaired. All expenses and costs incurred for inspection and testing/retesting shall be borne by the Contractor at no extra cost to the Engineer or to the State and shall be included in the Contract lump bid price for the item Water Service System.

Water Main Disinfection – Disinfection procedures shall be completed in accordance with AWWA C601 and the Delaware Division of Public Health regulations as specified herein.

Prior to disinfection, all new and exposed portions of existing systems shall be flushed at a minimum velocity of 2-1/2 feet per second.

One of the three methods of chlorination shall be used to disinfect water mains. They are the tablet method, which gives an average chlorine dose of approximately 25 mg/l, the continuous feed method, gives a 24 hour chlorine residual of not less than 10 mg/l and the slug method, with a 3 hour exposure of not less than 50 mg/l free chlorine. The Engineer and/or their representative shall be present to inspect the method of disinfection used and confirm test results.

When charging and testing mains, which are not close enough to connect directly by pipe or hose lines to mains carrying Engineer's water, tank wagons shall be used to haul water and serve as suction wells.

All labor, tools, materials, equipment, gauges and meters, necessary for making the tests and chlorinating these mains shall be furnished by the Contractor.

Before commencing the disinfection, the Contractor shall provide a written disposal plan to the Engineer and Delaware State Health Department. The plan shall detail how the Contractor will dispose of the chlorinated water. The disposal method shall be approved by the Engineer and State Health Department. If the water is heavily chlorinated, it shall be neutralized prior to disposal.

The Contractor shall be responsible for obtaining bacteriological tests to prove that the disinfection has been satisfactorily performed and the main can be placed in service.

Method of Measurement:

The quantity of Water Service System, service piping and/or hose bibs will not be measured.

Basis of Payment:

The quantity of Water Service System will be paid for at the Contract lump sum. Price and payment will constitute fill compensation for furnishing and installing all water main pipe and fittings, service pipe, restraint devices and/or thrust blocks, valves, hose stations, and concrete pads, dump station water towers, shower towers, water spigots, valve boxes, meter pits, pavement removal and replacement, excavation, backfill, compaction, dewatering, completing all connections to existing water main as shown in the Contract Drawings, furnishing all necessary borrow material, proper disposal of all excess material and construction debris and furnishing and installing all services, equipment, materials and labor necessary for the complete and proper installation of the water mains as indicated in the Contract Documents.

6/28/13

701505 - PORTLAND CEMENT CONCRETE PARKING BUMPER

Description:

This work consists of furnishing and installing portland cement concrete bumpers in accordance with the details and notes shown on Plans. The locations of installing the parking bumpers shall be in accordance with Plans or will be determined in the field by the Engineer.

Materials and Construction Methods:

Portland cement concrete shall be Class B, and shall conform to the requirements of Section 812, and bar reinforcement shall conform to Section 603 of the Standard Specifications.

Unless specified otherwise on the Plans, each parking bumper shall be anchored with two (2) 19 inch number 8 rebars driven flush with the top of the bumper. Any surface preparation necessary to provide a stable installation of the bumpers will be considered incidental to this item.

Method of Measurement:

The quantity of P.C.C. parking bumpers will be measured as the actual number of bumpers installed and accepted.

Basis of Payment:

The quantity of P.C.C. parking bumpers will be paid for at the Contract unit price per each. Price and payment will constitute full compensation for furnishing all materials including, but not limited to, concrete, bar reinforcement, anchor pins, installing the bumper as directed, for all labor, equipment, tools and incidentals to complete the item.

2/18/13

705532 - P.C.C. SIDEWALK, SPECIAL I, 4"
705533 - P.C.C. SIDEWALK, SPECIAL I, 6"
705534 - P.C.C. SIDEWALK, SPECIAL II, 6"

Description:

This work consists of constructing Portland Cement Concrete Sidewalk on a prepared foundation as shown on the plans and as directed by the Engineer.

Materials:

Portland Cement Concrete – Portland Cement Concrete shall conform to the requirements of Section 812, Class B.

Bar Reinforcement – Bar Reinforcement shall conform to the requirements of Subsection 824.01.

Wire Reinforcement – Wire Reinforcement shall be 6" x 6" (D10 x D10) [152 mm x 152 mm (MD65 x MD65)] welded wire fabric meeting, the requirements of AASHTO M 221 M and M 225 M.

Preformed Expansion Joint Material – Preformed Expansion Joint Material shall conform to the requirements of Subsection 808.06.

Curing Material – Curing materials shall conform to the requirements of Subsection 812.02(i).

Construction Methods:

The work shall be done in accordance with Section 705 of the Standard Specifications for Road and Bridge Construction, latest edition at the time of advertisement.

Method of Measurement:

The quantity of Portland Cement Concrete Sidewalk, Special will be measured by the square foot at the surface of the sidewalk, placed and accepted.

Basis of Payment:

The quantity of Portland Cement Concrete Sidewalk, Special will be paid for at the Contract unit price per square foot. Price and payment will constitute full compensation for furnishing, hauling, and placing all materials including the reinforcement; for preparing the foundation; for replacing rejected sidewalk; and for all labor, equipment, tools, and incidentals required to complete the work.

2/20/13

708583 - PERSONAL GRATE FOR PIPE INLET

Description:

This work consists of furnishing all materials, fabricating, delivering and constructing personnel grates for pipe inlets in accordance with the Standard Details, at locations as shown on the Plans, as directed by the Engineer and as required by these Special Provisions.

Materials:

Materials shall conform to the requirements of Sections 603 and 612 and shall be galvanized in accordance with Subsection 826.07 including all rebar, hardware and fasteners as shown on the Standard Details.

Working drawings shall be submitted in accordance with Subsection 105.04.

Construction Methods:

Personnel grates for pipe inlets shall be constructed based on the Standard Details and at the size and locations shown on the Plans.

Method of Measurement:

The number of inlet grates to be paid for under this item shall be the actual number of inlet grates installed and accepted.

Basis of Payment:

The quantity of personal grate for pipe inlet will be paid for at the Contract unit price per each. Price and payment will constitute full compensation for furnishing, hauling and installing materials, including bar reinforcement; for excavating including removal and disposal of existing end sections, backfilling, and compacting; for cribbing, shoring, sheeting, coating, and paving; and for all labor, materials, equipment, tools, and incidentals required to complete the work. Design services for the personnel grate for pipe inlet including the preparation and submittal of working drawings shall be incidental to this item.

5/22/13

710506 - ADJUST AND REPAIR EXISTING SANITARY MANHOLE

Description:

This work consists of adjusting and repairing existing sanitary manholes in accordance with notes and details on the Plans and as directed by the Engineer.

Materials and Construction Methods:

Materials and construction methods shall conform to the applicable requirements of Section 710 of the Standard Specifications, and the Standard Specifications of the owner of the sewer system. If there is a conflict between the Department's Specifications and the Specifications of the owner, the latter will prevail.

Method of Measurement and Basis of Payment:

The method of measurement and basis of payment for the item shall be made in accordance with Subsections 710.09 and 710.10 of the Standard Specifications.

8/28/01

710509 - INSTALLING MANHOLE OVER EXISTING SANITARY SEWER

Description:

This work consists of furnishing all materials and constructing Portland cement concrete precast sanitary manholes with doghouse riser over existing sanitary sewer, including the construction of a poured-in-place reinforced Portland cement concrete base slab, placement of precast riser sections including the setting of the "doghouse" riser, construction of the brick channel and benches, abandonment and plugging existing sewer pipes, installation of metal frames and covers in reasonably close conformity with the details shown on construction Plans and in accordance with the Standard Specifications and conforming to the requirements of the Owner of the Utility.

Materials and Construction Methods:

Materials and construction methods for these items shall conform to the applicable requirements of Section 708 of the Standard Specifications, requirements of the Owner of the Utility, and notes with details on the Plans.

Method of Measurement:

The quantity of manholes installed over existing sanitary sewer will be measured as the actual number installed and accepted.

Basis of Payment:

The quantity of manholes installed over existing sanitary sewer, will be paid for at the Contract unit price each. Price and payment will constitute full compensation for furnishing and placing all materials, for all necessary fittings, frames and covers, doghouse riser, manhole base, stone bedding, brick channel, bentonite, abandonment and plugging existing sewer pipes, temporary pumping of sewerage, dewatering, temporary bypass of flow, testing, excavation and backfilling around the structure, the disposal of surplus materials, for all labor, equipment, tools, and incidentals necessary to complete this item. Inlet and outlet pipe will not be measured or paid for under this item, but will be measured with the adjoining pipe and paid for at the contract unit price per linear foot (linear meter) bid for the appropriate pipe item.

8/14/02

710510 - CONNECTING SEWER TO EXISTING SANITARY MANHOLE

Description:

This work consists of furnishing and installing all materials necessary to connect the proposed sanitary sewer to existing manhole and reconstruction of the brick channel and bench in accordance with these specifications, the Plans and as directed by the Engineer and the Owner of the Utility.

Materials and Construction Methods:

Materials and construction methods for this item shall conform to the applicable requirements of Section 708 of the Standard Specification, requirements of the Owner of the Utility, and in accordance with the Plans.

Method of Measurement:

The quantity of sewer connections to existing sanitary manholes will be measured as the actual number of sewer connections to existing manholes completed and accepted.

Basis of Payment:

The quantity of sewer connections to existing sanitary manholes will be paid for at the Contract unit price per each. Price and payment will constitute full compensation for removing and disposing of all materials, furnishing and placing brick and concrete, excavation and backfilling, resetting the manhole frame and cover, raising or lowering the top of the existing manhole, placing bentonite, abandoning and plugging existing sewer pipes, temporary pumping of sewerage, dewatering, providing temporary flow bypasses, testing, and for all equipment, tools, labor and incidentals necessary to complete this item of work.

8/14/02

720556 - BOLLARD

Description:

This work consists of furnishing and installing fixed/removable bollards in accordance with the notes, Standard Construction Details and as directed by the Engineer.

Materials and Construction Methods:

The bollard shall be 4" Galvanized Steel Pipe, Schedule 40

Bollard Sleeve shall be 4" Polyethylene Thermoplastic cover

Concrete shall be Class B conforming to the requirements of Section 612.

The bollard shall be installed in the hole in vertical position on a 6" bed of #57 stone and encased with concrete as shown on the plans and/or as directed. All hardware shall be galvanized steel.

Method of Measurement:

The quantity of bollards will be measured as the actual number of bollards installed and accepted.

Basis of Payment:

The quantity of bollards will be paid for at the Contract unit price per each. Price and payment will constitute full compensation for furnishing and placing all materials, including stone, pipe, cover, concrete, excavation, backfilling, and disposing of the surplus material, for all labor, tools, equipment and necessary incidentals to complete the work.

6/28/13

720585 - GUARDRAIL END TREATMENT ATTENUATOR, TYPE 1 - 31
720586 - GUARDRAIL END TREATMENT ATTENUATOR, TYPE 2 - 31
720588 - GUARDRAIL END TREATMENT ATTENUATOR, TYPE 3 - 31

Description:

This work consists of furnishing and installing an impact attenuating guardrail end treatment in accordance with the locations, notes and details on the Plans, the Standard Construction Details, these Special Provisions, and as directed by the Engineer.

Materials:

The end treatment system shall meet the requirements of NCHRP Report No. 350 Test Level 3. The Guardrail End Treatment, Type 1 shall be designed for installation parallel to the roadway. The Guardrail End Treatment, Type 2 shall be designed for installation with the end flared back from the roadway. The Guardrail End Treatment, Type 3 shall be designed for installation where 2 runs of guardrail come together.

The entire end treatment shall be designed for quick and easy replacement after an impact.

Guardrail End Treatment Attenuator Type 1 shall have a minimum of 2 square feet (0.2 square meters) of yellow retroreflective material on the nose. Guardrail End Treatment Attenuator, Type 2 and Type 3 shall have a minimum of 3 square feet (0.3 square meters) of yellow retroreflective material on the nose.

The Contractor shall submit shop drawings, the manufacturer's certification, and the manufacturer's installation instructions to the Engineer. Installation cannot begin until these submissions have been approved by the Engineer.

Construction Methods:

The end treatment system shall be fabricated and installed in accordance with the manufacturer's recommendations and details shown on the Plans.

The end treatment system shall be installed so that there is no rigid object projecting more 4 (100 mm) above ground level in that portion of the attenuator impacted and broken away by an errant vehicle. It is the intent that the errant vehicle not be snagged by an embedded component of the end treatment attenuator.

The grading between the edge of pavement and the end treatment shall be 10:1 or flatter for the length of the end treatment.

Reflectorized washers are not to be used on attenuators unless specified and/or approved by the manufacturer.

The Guardrail End Treatment Attenuator, Type 1 shall be installed with steel tubes and soil plates for the first 4 (min.) wood post. As an alternate, the first 4 (min.) post may be hinged, breakaway steel post if the manufacturer's specifications permit.

Unless otherwise noted on the Plans, the Guardrail End Treatment Attenuator, Type 1 shall be installed with a 50:1 taper beginning 50' (15 m) from the end of the end treatment.

Method of Measurement:

The quantity of guardrail end treatment attenuators will be measured as the number of each type fabricated, installed and accepted.

Note: All guardrail end treatment attenuators will be considered as 50 feet (15 meters) long. The 50' (15 m) length will begin at the center of the nose post and extend back along the attenuator and guardrail to which it is attached. Any guardrail within the 50' (15 m) length will be considered as part of the

guardrail end treatment attenuator and not be measured separately. Measurement for the guardrail will begin 50' (15 m) from the center of the nose post of the attenuator.

Basis of Payment:

The quantity of guardrail end treatment attenuators will be paid for at the Contract unit price per each type of guardrail end treatment attenuator. Price and payment will constitute full compensation for furnishing all materials, fabrication and installation and for all materials, labor, equipment, tools and incidentals required to complete the work.

Note: When this item is completely installed, the Contractor may notify the Engineer and request acceptance. The Engineer will make an inspection of the installation and the Contractor shall correct any deficiencies. Once the corrective work is completed to the satisfaction of the Engineer, the installation will be accepted and the Contractor will be relieved from the responsibility for this item. If this item is damaged before the final acceptance of the project, and the damage is not the result of the Contractor's negligence, the Engineer will notify the Contractor to make repairs, and the Contractor will make repairs at the unit price bid (in the case of complete replacement) or at a negotiated price (in the case of partial replacement or repair). Damage caused by the Contractor shall be repaired at no cost to the Department.

4/7/11

727506 - RELOCATING FENCE

Description:

This work consists of relocating the existing fence of the type and height at locations shown on the Plans and in accordance with these Special Provisions, notes on the Plans, and as directed by the Engineer.

Materials and Construction Methods:

All existing fence, posts, hardware and accessories shall be salvaged and reused. Any material which cannot be salvaged, shall be replaced with similar material or approved equal after obtaining approval from the Engineer. Concrete, if required for setting the posts, shall conform to Section 812, Class B Portland Cement Concrete.

The Contractor shall notify the Engineer and the owner at least three days in advance prior to removal of the fence, unless specified otherwise on the Plan or by the Engineer. Existing fence, posts, and accessories shall be removed and salvaged and reset at location indicated on Plan or as directed by the Engineer. The hole left by the removal of the post shall be backfilled with suitable material.

Spacing and setting of the posts, railing and/or fence panel, shall conform to the existing conditions. All paved or grassed areas disturbed shall be restored to the original conditions at the Contractor's expense.

Method of Measurement:

The quantity of relocated fence will be measured as the actual number of linear feet (linear meters) of fence relocated and accepted measured along the fence.

Basis of Payment:

The quantity of relocated fence will be paid for at the Contract unit price per linear foot (linear meter). Price and payment will constitute full compensation for removing, salvaging and resetting the fence, for furnishing required new material as replacement, concrete if required, excavation and backfilling, disposing of the discarded materials, for all labor, tools, equipment, and incidentals necessary to complete the item.

2/18/13

727510 - WOOD RAIL FENCE

Description:

This work consists of furnishing all materials and constructing wood rail fence in accordance with the plans, details and specifications at the locations shown on the Plans and as directed by the Engineer.

Material and Construction Methods:

All materials, such as fence, posts, hardware and accessories shall be new. Concrete, if necessary, shall conform to Section 812, Class B of the Standard Specifications.

Lumber shall be grade 2, conforming to Subsection 601.02 of the Standard Specifications.

Lumber shall be treated with ACQ treatment. Post shall have a minimum retention of 0.40 pcf and rails shall have a minimum retention of 0.25 pcf

All hardware shall conform to the requirements and Subsection 601.07 of the Standard Specifications.

Method of Measurement:

The quantity of wood rail fence will be measured by the linear feet along the actual fence constructed and accepted.

Basis of Payment:

The quantity of wood rail fence will be paid for at the Contract unit price per linear foot. Price and payment will constitute full compensation for all new materials and installing fence, concrete if required, excavation and backfilling, for all labor, tools, and incidentals necessary to complete the item.

2/18/13

727519 - RELOCATE CHAIN LINK FENCE

Description:

This work consists of furnishing any required new materials and resetting the chain link fence shown on the Plans. The fence shall be reset at locations as directed by the Engineer. Footings shall conform to the detail shown on the Plans.

Materials:

All materials lost or in any way damaged shall be replaced with new material matching the present fences. Concrete for the new post footings for the fences shall conform to Section 812, Class B, Portland Cement Concrete.

Construction Methods:

The fences shall be reset true to line and grade. The elevation of the top of the fences shall be uniform. Necessary grading to accomplish these requirements shall be performed by the Contractor as part of the Contract.

Method of Measurement:

The quantity of relocated chain link fence will be measured the actual number of linear feet (meters) of fence relocated and accepted, measured in place along the line of the fence in the area of relocation only.

Basis of Payment:

The quantity of relocated chain link fence will be paid for at the Contract price per linear feet (meter). Price and payment will constitute full compensation for resetting the present fence, clearing the line of the fence, grading the area to conform to the contours of the adjacent area, furnishing and placing concrete for posts and for any backfill required, furnishing and placing all materials required to make any repairs to the existing fences and in resetting the fence, and for all labor, equipment, tools, and incidentals necessary to complete the item.

3/14/02

727521 - VEHICULAR GATE, SPECIAL

Description:

This work consists of furnishing all materials and erecting the galvanized steel pipe gates in accordance with these specifications and as shown on the Plans.

Materials:

All Metal Posts. Tubular steel posts and braces shall conform to the requirements of AASHTO M 281 and shall be galvanized in accordance with AASHTO M 111. Steel posts of tee, channel, wide flange, or U-bar shapes, shall be formed structural steel, hot-rolled carbon steel, or hot-rolled rail steel, having a minimum yield strength of 40,000 psi (280 MPa) and a minimum ultimate strength of 70,000 psi (480 MPa). Steel posts shall be either galvanized in accordance with AASHTO M 111

Portland Cement Concrete shall be Class B

Fabrication:

Fabrication of materials furnished under this section shall conform to the sizes, shapes, dimensions, and other factors shown on the plans and shall show careful, finished workmanship in all respects.

Construction Methods:

Concrete footings shall be constructed in accordance with the dimensions shown on the plans. All posts shall be set in concrete. Post shall be centered in the footing. The concrete shall be thoroughly compacted around the posts by tamping or vibrating, and shall be slightly higher than the ground line. The top surface of the footing shall be smooth and sloped to drain moisture away from the posts. No attachments shall be placed on the posts, and no post shall be disturbed in any manner, within 72 hours after the concrete footing is complete. Hand mixed concrete shall not be allowed.

Method of Measurement:

The quantity of vehicular gate, special will be measured per each.

Basis of Payment:

The quantity of vehicular gate, special will be paid for at the Contract unit price per each. Price and payment will constitute full compensation for furnishing and installing all materials including fittings and hardware and for all labor, equipment, tools and incidentals required to complete the work.

2/18/13

727522 - DECORATIVE FENCE

Description:

This work consists of furnishing all materials and erecting the three rail aluminum decorative fence in accordance with these specifications and as shown on the Plans. Two gates as noted on the drawings are considered incidental to this section.

The fencing system shall be Industrial Strength Aluminum Decorative Fence as manufactured by:

a. Ameristar Fence Products, 1555 N. Mingo Rd, Tulsa, OK 74116. Montage Plus Majestic Style. Telephone number 1-888-333-3422.
b. Master Halco by Monumental Iron Works, 110 E. La Habra Blvd., La Habra, CA 90631. Imperial Style B. Telephone number 1-800-229-5615.
c. Or approved equal approved by the Engineer.

The industrial ornamental aluminum fence system shall be 46" in height with a 3-Rail style. Pickets shall be 3/4" of 42" height. Post caps shall be flat. The color of the fence system shall be determined at shop drawings. Submit color samples for approval. All coatings shall be polyester powder coated.

Materials:

Aluminum Extrusions: Aluminum material for fence framework (i.e., tubular pickets, rails and posts) shall conform to the requirements of ASTM B221. The aluminum extrusions for posts and rails (outer channel) shall be Alloy and Temper Designation 6005-T5. The aluminum extrusions for pickets and rail inner slide channels shall be Alloy and Temper Designation 6063-T5 or aluminum alloy having a minimum strength of 35,000 psi (241 MPa) and pickets shall have a minimum strength 15,000 psi (172 MPa).

Swing Gates: 5' as located on the plans – two (2) total provided

Fasteners: All screws shall be 302 stainless steel self-drilling head. All screws shall be painted to match the finish of fence.

Rail System:	Three (3) Rail System
Top Rail:	Smooth
Bottom Rail:	Flush

Accessories: Aluminum castings shall be used for all post caps, brackets, finishes and other miscellaneous hardware.

Finish:

Pretreatment: A three stage non-chrome pretreatment shall be applied. The first step shall be a chemical cleaning, followed by a water rinse. The final stage shall be a dry-in-place activator which produces a uniform chemical conversion coating for superior adhesion. Screws shall be plated with zinc dichromate to ensure corrosion resistance.

Coating Fence materials shall be polyester powder coat finish with a minimum thickness of 2 mils (0.0508mm). The color shall be silver. Epoxy powder coatings, baked enamel or acrylic paint finishes are not acceptable. In addition, the screw heads shall be painted to match the color of the fence.

Tests: The cured finish shall meet the following: 1) Humidity resistance of 3,000 hours using ASTM D2247. 2) Salt spray resistance of 3,000 hours using ASTM B117. 3) Accelerated weathering for 1,000 hours under Method 5152 of Federal Test Method 141 shall show no adhesion loss with only a slight fading, chalking and water staining. 4) Outdoor weathering shall meet minimum standards of D822, D2244, and D523. 5) Minimum hardness of 2H using ASTM D3363.

If the Contractor selects any material that differs from the above special provision, the material shall be pre-approved by the Engineer before installation.

Construction Methods:

1. Set fence post plumb in concrete footing and brace at on center maximum as specified in the Contract drawings.
2. Insert stringer ends into pre-punched post and fasten with specified screws.
3. Recheck vertical and top alignment of posts, and make necessary corrections.
4. Fence panels shall be attached to posts with brackets supplied by the manufacturer.
5. Apply custom finish paint supplied by manufacturer matching fence color to any exposed surfaces.
6. When cutting/drilling rails or posts adhere to the following steps to seal the exposed surfaces; Remove all metal shavings from cut area.

Method of Measurement:

The quantity of decorative fence will be measured in linear feet of decorative fence installed and accepted. Measurement will be made from center of end post to center of end post.

Basis of Payment:

The quantity of decorative fence will be paid for at the Contract unit price per linear feet. Price and payment will constitute full compensation for furnishing and installing all materials including footing, fittings and hardware and for all labor, equipment, tools and incidentals required to complete the work.

2/18/13

734508 - TEMPORARY SEED MIX
734510 - REFERTILIZATION OF PERMANENT SEED MIX

All requirements of Section 734 shall apply except as modified below:

Add the following to Section 734.01 Description:

This will include, but not limited to furnishing and installing seed, the preparation of the seed bed, sowing of seed, topdressing, and maintenance of the planting until establishment, all in accordance with these Specifications and at locations indicated on the Plans or designated by the Engineer. Work described under this specification shall be performed by a contractor with a minimum of five years of experience in successfully establishing seed mix or plantings composed of species native to Mid Atlantic Coastal area of US.

734.03 Soil Supplements

Delete 734.03 part a. of Soil Supplements and replace with the following.

Limestone shall not be used as a soil supplement.

Delete the first paragraph in Subsection 734.03 part b.1., and replace with the following:

No fertilization shall be added to*: Temporary Grass Seeding - Wet Ground; Seed Mix #1 - Permanent Grass Seeding-Wet Ground, Modified; Seed Mix #2 -Grass and Forb Mix; Seed.*

Fertilizer shall be delivered to the site fully labeled and shall bear the name, trade name, trademark and warranty of the provider, and net weight of contents. The engineer reserves the right to reject any material that has been caked or otherwise damaged. If the fertilizer is not used immediately it shall be stored in a cool dry place in such a manner that its effectiveness is not impaired.

Add:

(f): *Non-Asphaltic Tackifier (Binder).* Collodial tackifier (binder) recommended by fiber mulch manufacturer for slurry application; non-toxic and free of plant growth or germination inhibitors.

734.04 Grass and Agricultural Seeds

Delete Subsection 734.04 part c., and replace with the following text and chart:

Temporary Grass Seeding - Wet Ground

Seeding Chart					**Modification Factors for Seeding Rate (pounds per acre)**		
Temporary Grass Seeding - Wet Ground							
Species	Max % Weed Seeds	Min % Purity (PLS)	Min % Germination	Seeding Rate (lb/ac)	Seeding Period A (2/16 to 4/15)	Seeding Period B (4/16 to 8/15)	Seeding Period C (8/16 to 2/15)
Rough Barnyard Grass Echinochloa muricata, Echinochloa walteri	1.00	90	90	40	Add 65 lb/acre Winter Rye (Secale cereale) from 2/16 to 3/1		Add 65 lb/acre Winter Rye (Secale cereale) from 2/16 to 3/1
Total Seed Quantity (lb/ac)				40	105	40	105

Delete E. crusgalli' from 743.04 c. Seeding Chart Note 6

Delete Note 8 fully from 743.04 c. Seeding Chart Notes

Add the following to Subsection 734.04 Grass and Agricultural Seeds

The following shall apply for Seed Mix # l, Seed Mix # 3, and Seed Mix#4:

The pure live seed (PLS) value for each species of seed to be planted shall match or compensate for a percentage value of 100%. Each species shall have the minimum germination rate and percent purity listed in the Seeding Chart of the Subsection 734.04 part c. This value shall be obtained by testing each species of seed for the percent purity and the germination percent of the seed lot and multiplying the two values to determine the PLS value. The adjusted quantity to be sown shall be calculated as follows:

$$\text{Adjusted lb/acre} = \frac{\text{Intended PLS x Intended lb/acre}}{\text{Actual PLS}}$$

Seeds having a total inert matter and weed seed content greater than 20% shall be rejected. Any sample containing greater than 1% by weight of weed species other than the species intended shall be rejected.

All seed shall be obtained from a source within 100 miles of the planting site. Contract collection of seed shall be carried out by an agency which has experience and research abilities in collecting native seed for a minimum of 5 years. If the Contractor is unable to locate a source within the specified area, the contractor shall submit an alternate source to the Engineer for approval. All seed shall be guaranteed by the vendor to be true to its name and variety. All seed furnished shall be guaranteed to be from the origin specified.

A minimum of thirty days prior to the time of seeding, the Contractor shall provide for the approval of the Engineer, a written description of the Seed Mixes showing the following:

A. Name and location of the seed supplier for each species of seed.
B. Origin and date of harvest of each species of seed.
C. A statement of the purity and germination rate of each species of seed.
D. The estimated number of seeds/lb. for each species of seed.
E. The percentage by weight for each seed species in a Seed Mix.
F. Pure live seed test date.
G. Other Crop Percentage
H. Inert Matter Percentage
I. Weed Seed Percentage

The following are the recommended Nurseries for permanent seeding:

1. Ernst Conservation Seeds
   9006 Mercer Pike Meadville PA 16335
   Tel no: 800-873-3321
   Fax: 8143365191
   Contract #23-073-03
   Contact: Amanda, Kim

2. Sylva Native Nursery
   3815 Roser Road
   Glen Rock, PA 17327
   Phone nos. (717) 227-0486
   Fax: (717) 227 -0484

3. Or Approved Equal.

Construction Methods:

Delete Lime' from Subsection 734.06 General.

Add the following:

All seeding operations shall be completed within the seeding window as specified herein. If possible, seeding shall be performed before a forecasted rain event. Seeding shall not be done during periods of rain, severe drought, high winds, excessive moisture, or other conditions that preclude satisfactory results.

The engineer shall be informed in writing of conditions detrimental to the proper and timely completion of the work. The contractor shall identify the areas that are detrimental for seeding and consult with the Engineer to determine the corrective action. Seeding work is not to proceed until the condition is either corrected or a waiver is guaranteed by the engineer. No seeds shall be sown until the seed bed has been approved by the Engineer.

Site Preparation: Areas to be seeded shall be maintained at approved grades. All mechanical equipment for soil preparation or seeding shall be as approved and shall pass parallel to the contours unless otherwise directed by the Engineer

Prior to seeding, eroded, crusted soils shall be scarified or track with equipment to create an seed bed acceptable to the Engineer. The Contractor shall be responsible for performing all work necessary to achieve and maintain an acceptable seed bed prior to seeding as directed by the Engineer at no additional cost to the Department.

Seeding operations shall be initiated and completed within the seeding dates indicated for each of the mixes. The Contractor shall notify the Engineer at least forty-eight (48) hours in advance of the time he/she intends to begin sowing seed and shall not proceed with such work until permission to do so has been obtained. When delays in operations carry the work beyond the dates specified in the schedule, or when conditions of high winds, excessive moisture or ice are such that satisfactory results are not likely to be obtained at any stage of the work, the Engineer shall stop the work. The work shall be resumed with the Engineer's approval when the desired results are likely to be obtained or when approved corrective measures and procedures are adopted.

734.08 Seeding Slopes 1:3 (vertical to horizontal) or Steeper

Remove all references to Permanent Crown Vetch Seeding and the use of lime along from this sub-section.

Replace the wording in Subsection 734.08 part a. with the following:

Seeding for each area will be specified on the plans, as well as which seed mix will be required for which specific area.

Add to the first paragraph of Subsection 734.08 e.:

All hydroseeding shall include a tackifier (binder) and wood cellulose mulch as per the manufacturer's recommendation and material specifications as approved by the Engineer.

Basis of Payment:

Add the following to 734.10 Basis of Payment:

The Department reserves the right to delete from the Contract the furnishing and installing of one or more of the specified quantity listed in any seed mix and the right to add or subtract from the quantity or each species listed in any seed mix. The lump sum to be paid will be adjusted in accordance with the contractor's unit prices as required above. There will be no extra compensation to the contractor if such additions and / or deletion are made.

11/17/10

734522 - SEED MIX #1
734523 - SEED MIX #2
734524 - SEED MIX #3
734525 - SEED MIX #4

Description:

Add the following after the end of 734.01 of the Standard Specification:

Seed Mix#1, Seed Mix#2, Seed Mix#3, and Seed Mix#4 will include, but shall not be limited to furnishing and installing seed, the preparation of the seed bed, sowing of seed, topdressing, and maintenance of the planting until acceptance, all in accordance with these Specifications and at locations indicated on the Plans or designated by the Engineer. Work described under this specification shall be performed by a contractor with a minimum of five years of experience in successfully establishing seed mix or plantings composed of species native to Mid Atlantic Coastal area of US.

Materials:

Add the following after the end of 734.04 of the Standard Specifications:

Under this Contract, the use of Eragrostis curvula (Weeping Lovegrass), Lespedeza stipulacea (Korean Lespedeza) and Coronilla varia (Crown Vetch) is strictly prohibited.

The following shall apply for Seed Mix#1, Seed Mix#2, Seed Mix#3, and Seed Mix#4:

a. The pure live seed (PLS) value for each species of seed to be planted shall match or compensate for a percentage value of 100%. Seeds shall be applied on a PLS measure per acre.
b. Seed mixes shall not exceed a total inert matter and weed seed content greater than 20%. Any sample containing greater than 1% by weight of weed species other than the species intended shall be rejected.
c. All seed shall be obtained from a source within 100 miles of the planting site. Contract collection of seed shall be carried out by an agency which has experience and research abilities in collecting native seed for a minimum of 5 years. If the Contractor is unable to locate a source within the specified area, the contractor shall submit an alternate source to the Engineer for approval. All seed shall be guaranteed by the vendor to be true to its name and variety. All seed furnished shall be guaranteed to be from the origin specified.

A minimum of thirty days prior to the time of seeding, the Contractor shall provide for the approval of the Engineer, a written description of the Seed Mixes showing the following:

a) Name and location of the seed supplier for each species of seed.
b) Origin and date of harvest of each species of seed.
c) A statement of the purity and germination rate of each species of seed.
d) The estimated number of seeds/lb. for each species of seed.
e) The percentage by weight for each seed species in a Seed Mix.
f) Pure live seed test date.
g) Other Crop Percentage
h) Inert Matter Percentage
i) Weed Seed Percentage

The following are the recommended Nurseries for Seed Mix#1, Seed Mix#2, Seed Mix#3, and Seed Mix#4:

a) Ernst Conservation Seeds
9006 Mercer Pike
Meadville, PA 16335
Tel. no: 800-720-5540
Fax: (814) 336-5191

b) Sylva Native Nursery
3815 Roser Road
Glen Rock, PA 17327
Tel. no. (717) 227-0486
Fax: (717) 227 -0484

c) North Creek Nurseries
388 North Creek Road
Landenberg, PA 19350
Tel. no. (610) 255-0100
Fax: (610) 255 -4762

Seed Mix #1
Minimum Percent Germination: 50%
Minimum Percent Purity: 80%
Pure Live Seed Per Acre: 100%

Seeding	Seed Mix % (PLS)
Aster spectabilis Showy Aster	20%
Euthamia caroliniana Coastal plain goldentop	2%
Panicum amarum Panic Grass	78%

Minimum Total Quantity of Seed Mix #1: 20.00 lbs/acre (PLS)

Seed Mix #2
Minimum Percent Germination: 50%
Minimum Percent Purity: 80%
Pure Live Seed Per Acre: 100%

Seeding	Seed Mix % (PLS)
Aster spectabilis Showy Aster	21%
Asclepias tuberosa Butterfly milkweed	11%
Lespedeza virginica Slender bush clover	16%

Euthamia caroliniana Coastal plain goldentop	4%
Panicum virgatum Switch Grass	23%
Solidago juncea Early goldenrod	20%
Monarda punctata Spotted beebalm	5%

Minimum Total Quantity of Seed Mix #2: 20.00 lbs/acre (PLS)

Seed Mix #3
Minimum Percent Germination: 80%
Minimum Percent Purity: 80%
Pure Live Seed Per Acre: 100%

Seed	Seeding Mix % (PLs)
Euthamia caroliniana Coastal plain goldentop	6%
Panicum amarum Coastal Panic Grass	94%

Minimum Total Quantity of Seed Mix #3 : 16.0 lbs/acre (PLS)

Seed Mix #4
Minimum Percent Germination: 50%
Minimum Percent Purity: 80%
Pure Live Seed Per Acre: 100%

Seed	Seed Mix % (PLS)
Panicum amarum Coastal Panic Grass	100%

Minimum Total Seed Mix #4: 60.00 lbs/acre (PLS)

Seed Mix #1, Seed Mix #2, Seed Mix #3 and Seed Mix #4 shall also include a quantity of Oats (Avena sativa) to act as a nurse crop in the establishment of the seed. Seed mixes#1, Seed Mix #2, Seed Mix #3 and Seed Mix #4 shall include 20 lbs/acre of Oats. Oats (Avena sativa) shall be of a commercial grade meeting the requirements of the State Seed Law. Seed labeled with the notation "germination below standard" shall not be used. Seed shall not be used after one year from date of germination test shown on the label.

Construction Methods:

Add the following to 734.05 General:

No seed shall be sown until the purity test has been carried out and the seed meets all the requirements mentioned under Subsection 734.04. All seeding operations shall be completed within the seeding window as specified herein. If possible, seeding shall be performed before a forecasted rain event. Seeding shall not be done during periods of rain, severe drought, high winds, excessive moisture, or other conditions that preclude satisfactory results.

The Engineer shall be informed in writing of conditions detrimental to the proper and timely completion of the work. The contractor shall identify the areas that are detrimental for seeding and consult with the Engineer to determine the corrective action. Seeding work is not to proceed until the condition is either corrected or a waiver is granted by the engineer. No seeds shall be sown until the seed bed has been approved by the Engineer.

Seeding shall follow the methods and procedures identified on the plans.

Add the following to 734.05 Seeding Season:

The calendar dates for seeding of Seed Mix #1, Seed Mix #2, Seed Mix #3 and Seed Mix #4 shall be September 1 to November 15

Add the following after the end of 734.05 of the Standard Specifications:

Watering.

The Contractor shall thoroughly water newly seeded areas immediately upon installation at the rate of 25,000 gallons per acre as directed by the Engineer. The Contractor shall avoid creating rills and furrows as a result of watering. The Contractor shall be responsible for repairing and reseeding any rills or furrows caused by over watering at the Contractor's own expense.

Add the following at the end of Section 734.06:

Acceptance of Seed Mix #1, Seed Mix #2, Seed Mix #3 and Seed Mix #4 shall be made at time of placement, provided the seed is mixed and placed as specified and as directed on the Plans.

Add the following at the end of Section 734.07:

No Maintenance Bond is required for this work.

All other aspects and conditions of Section 734 – Seeding shall apply.

Method of Measurement:

As per Section 734 – Seeding.

Basis of Payment:

Delete the following from 734.10:

The quantity and type of seeding will be paid for at the Contract unit price per square yard (square meter). Price and payment will constitute full compensation for preparing the ground; for furnishing and placing all materials including seed and mulch; and for all labor, equipment, tools, maintenance bond and incidentals required to complete the work.

Add the following to 734.10:

The quantity and type of seeding will be paid for at the Contract unit price per square yard (square meter). Price and payment will constitute full compensation for preparing the ground; for furnishing and placing all materials including seed and mulch; **and watering**; and for all labor, equipment, tools, maintenance bond and incidentals required to complete the work.

1/20/13

735535 - SOIL RETENTION BLANKET MULCH, TYPE 5
735536 - SOIL RETENTION BLANKET MULCH, TYPE 6
735537 - SOIL RETENTION BLANKET MULCH, TYPE 7

Description:

This work consists of furnishing, placing and anchoring soil retention blanket mulch over seeded areas in accordance with notes and details on the Plans, these specifications and direction of the Engineer.

Materials:

The blanket mulch shall be one of the pre-approved products listed in the Approved Product List (APL) at the time of bid, for the type(s) of mulch required on the Plans.

Pre-approval procedures and the current APL may be obtained by writing to the Stormwater Engineer, Delaware Department of Transportation, P. O. Box 778, Dover, DE 19903 or calling (302) 760-2177 or viewing DelDOT's web page at **www.deldot.net/business**. The Contractor shall submit an 8" x 8" (200 mm x 200 mm) sample to the Stormwater Engineer to verify pre-approval. Also, the Contractor shall submit manufacturer's literature, including installation recommendations, to the Engineer.

The products on the APL have been used extensively on DelDOT projects with satisfactory results and/or have received satisfactory evaluations by the NTPEP (National Transportation Product Evaluation Program).

Soil Retention Blanket Mulch, Types 5, generally referred to as erosion control blankets (ECB), shall be composed entirely of 100% biodegradable material.

Soil Retention Blanket Mulch, Types 6 and 7, generally referred to as turf reinforcement mats (TRM), shall be composed of mostly non-degradable material.

In order for a product to be added to DelDOT's Approved Product List and be eligible for use in DelDOT's construction and maintenance works, the product must meet the above guidelines and receive a satisfactory evaluation by NTPEP. The Department will remove products from the APL when field performance is unsatisfactory.

Types of Soil Retention Blanket Mulch Application

Type 5. Top-soiled grass swale at maximum design shear stress less than or equal to 2 pounds per square foot (96 Pascals)

Type 6. Top-soiled grass swale at maximum design shear stress greater than 2 pounds per square foot (96 Pascals) and less than or equal to 6 pounds per square foot (287 Pascals)

Type 7. Top-soiled grass swale at maximum design shear stress greater than 6 pounds per square foot (287 Pascals) and less than or equal to 8 pounds per square foot (383 Pascals)

Construction Methods. The soil retention blanket mulch, shall be placed immediately after seeding operations have been completed or as approved by the Engineer, but in no case shall this period exceed 24 hours from the completion of the seeding operation. Prior to seeding and mulching, the area to be mulched shall be tracked, free of ruts, rocks or clods over 1 1/2 inches (40 millimeters) in maximum dimension and all sticks or other foreign materials which will prevent the close contact of the blanket with the soil. If as a result of rain, the prepared bed becomes crusted or eroded or if any eroded areas, ruts or depressions exist for any reason, the Contractor shall retrack and reseed the eroded areas.

Except for sprayed blanket mulch installation and anchorage of the soil retention blanket mulch shall be in accordance with notes and details in the Plans and the following DelDOT Standard Construction Details:

Standard No. E-9 for rolled blankets under Type 5
Standard No. E-25 for blankets under Types 6 and 7

Should the installation requirements of the manufacturer be more stringent than the above, the manufacturer's requirements shall govern.

Sprayed blanket mulches shall be applied as per the manufacturer's instructions and recommended rate. No application shall be permitted if rain is anticipated within 24 hours as determined by the Engineer.

Method of Measurement:

The quantity of soil retention blanket mulch will be measured in square yards (meters) of each type soil retention blanket mulch installed and accepted. Measurements for calculating the number of square yards (meters) will be made along the surface of the area covered. Overlaps of materials of any kind will not be measured.

Basis of Payment:

The quantity of soil retention blanket mulch will be paid for at the contract unit price per square yard (meter) per each type. Price and payment will constitute full compensation for furnishing and placing all materials; for all methods of anchorage and securement; for repairing any loose or raised pins or pegs or any loose, torn, or undermined fabric; and for all labor, equipment, tools, and incidentals required to complete the work.

1/29/2013

737523 - PLANTING

Delete Section 737 in its entirety and replace with the following:

737.01 Description. This work consists of furnishing and planting specified plants, shrubs, and trees and the replacement and cultural care of the material.

MATERIALS.

737.02 Plant Material.

a. *Quality.* All plants shall be true to type and nomenclature and typical of their species or variety. They shall have a normal habit of growth with well-developed branch systems and vigorous root systems. They shall be sound, healthy, and vigorous plants, free from defects, disfiguration, injury, disease of any kind, insect eggs, borers, and any infestation. All plants shall be nursery grown. They shall have been growing under similar climatic conditions to those of the locality of the Project for at least two years prior to planting. All plant material shall have been grown in a soil that is similar to this area and shall not have been grown in a muck type soil or other foreign type. It shall 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. All plants shall be freshly dug, and no heeled-in or cold storage plants will be accepted, with the exception of plant material delivered prior to planting as outlined in Subsection 737.14.

b. *Measurements.* All plants shall conform to all sizes and measurements specified in the Plant List. Plants that conform to the requirements specified in the Plant List but do not have a normal balance between height and spread will not be accepted. Where any requirement or exact measurement is omitted, the plants furnished shall be normal for the species and variety as listed in AAN's "USA Standards for Nursery Stock". Plants for use where symmetry is required shall be matched as close as possible. All plants shall be measured for height and spread with the branches in their normal position. The trunk diameter of all trees shall be taken 6" (150 mm) above the ground level for up to and including 4" (100 mm) diameter sizes, and 12" (300 mm) above the ground level for larger sizes. The height of the branches on the tree trunks need not be as specified if the required height can be obtained by pruning the lower branches without leaving unsightly scars and damaging the trunk. No pruning of branches for this effect shall be done before delivery to the site unless approved. Plants larger in size than specified may be used. Larger plants, when selected for use over that which is specified, shall be dug with an earth ball or root spread proportionate to the increased size. With plants smaller than specified, credit shall be offered to the Department for approval. The basis of a credit shall be the average wholesale value based on the difference between the specified size and the next smaller size. The average wholesale value shall be substantiated with written submissions in accordance with Subsection 737.02 (e).

c. *Inspection.* The Contractor shall be responsible for all certificates of inspection of plant materials that may be required by Federal, State, or other authorities to accompany shipment of plants. The Contractor shall furnish complete information as to the location of all plants which it intends to supply and use. The right is reserved to inspect, tag, 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 site. All plants must be inspected and approved before they are planted. Any plants placed without prior inspection at the site will be rejected at the discretion of the Engineer. The Plant materials shall be protected according to best horticultural practice while in transit in such a way as to prevent the drying or possible desiccation of plant tissue. All plant material arriving at the site with broken or loose balls, or dry or insufficiently developed roots, and plants which are weak or thin, damaged or defective, or which do not comply with the specifications, will not be accepted. The Engineer reserves the right to reject all stock that is found to be unsatisfactory. All plant material determined as unsatisfactory by the Engineer shall not be planted under any circumstances

and shall be removed from the Project site by the close of the working day. Failure on the part of the Contractor to comply with any of the above procedures will require an immediate suspension of all work.

d. *Nomenclature.* Plants shall conform to the nomenclature of "Standard Plant Names" as accepted by the American Joint Commission of Horticulture Nomenclature, 1942 Edition. Names of varieties not included shall conform to names accepted in nursery trade. Size and grading shall conform to those listed in AAN's "USA Standards for Nursery Stock". No substitution will be permitted except by written permission of the Engineer.

e. *Availability.* The Engineer, after receiving written request from the Contractor for substitution, will verify and establish the non-availability of the specified plant and size to this satisfaction. Upon determining that a substitution is justified, the Contractor will be directed to provide certification in the form of five letters from five independent growers who list the specified plant form in their most current catalog, stating that the item in question is not available as specified.

f. *Experience.* Under Special Condition No. 22 of the U.S. Army Corps of Engineers 404 Permit, it is stipulated that: *The mitigation and post-planting monitoring plans shall be developed and implemented by a firm with demonstrated expertise in wetland creation activities.*

Therefore, the firm that does the actual planting and seeding of the mitigation site shall possess a record of successful wetland woody and wetland herbaceous and seeding programs that have received final approval by the U.S. Army Corps of Engineers, or have on-site staff personnel who have managed successful wetland woody and herbaceous planting and seeding programs that have received final approval by the U.S. Army Corps of Engineers. At the request of the Department, information indicating compliance with this "Special Condition" shall be forwarded within 14 days.

737.03 Trees. Trees shall have straight trunks according to their habit of growth and shall be well branched and rooted. Shade trees of standard variety shall have a single leader and shall be branched at 6 to 8' (1.8 to 2.4 m) height unless otherwise directed.

737.04 Shrubs. Shrubs shall be well branched, with full and compact growth and have ample well branched root systems capable of sustaining vigorous plant growth.

a. *Woody Shrub Cuttings*-Cuttings shall be fresh 24" (600 mm) long stems of woody plants. Each cutting shall have a living terminal bud (end bud). Prior to installation, the cutting shall be kept cool and moist to prevent desiccation of the material. Degraded, rotting, or dried out material will not be accepted.

737.05 Ground Cover and Herbaceous Perennials.

Ground cover shall be one year old, container grown plants, unless otherwise approved or specified in the Contract documents and shall have been growing for at least six months in the size specified as verified by the Department's inspection representative.

Herbaceous plant material shall be at least six months old and shall have been growing for at least three months in the size specified unless otherwise detailed in the plans, and as verified by the Department's inspection representative.

737.06 Soil Mix.

a. *Topsoil.* Planting topsoil shall consist of natural surface soil from well drained areas from which no topsoil has previously been stripped. The topsoil shall be free of subsoil, heavy clay, hard clods,

weeds, roots, sticks, toxic substances, or any other extraneous material. The topsoil shall have a pH range of from 5.5 to 6.8 and contain not less than 2% nor more than 10% organic matter. The topsoil shall exhibit the following grading analysis:

Sieve Size Minimum	*Percent Passing*
2" (50 mm)	100
No. 4 (4.75 mm)	90
No. 10 (2.00 mm)	80

The Contractor shall take the necessary action to ensure that the topsoil meets the sieve analysis, acidity, and organic matter requirements. A certificate of analysis of soil samples shall be provided to the Engineer and approved prior to delivery of topsoil to the Project site.

b. *Peat Moss and Peat Humus.*

i. Peat Moss. Peat moss shall be from sphagnum peat bogs. All peat moss shall be shredded, not dusty, and free of twigs, stones, hard lumps, roots, or any other undesirable materials. All peat moss must be moistened before using, but not watered to a saturated or puddled, unworkable condition. Peat moss shall show an acid reaction of 3.5 to 5.5 pH. The Contractor shall provide written certification from the manufacturer that the peat moss was obtained from sphagnum peat bogs.

ii. Peat Humus. Peat humus shall be a natural peat or peat humus from fresh water saturated areas, consisting of sedge, sphagnum, or reed peat and be of such physical condition that it passes through a 2" (12.5 mm) sieve. The humus shall be free from sticks, stones, roots, and other objectionable materials. Samples taken at the source of supply shall have the following analysis:

Acidity Range	*4.0 to 7.5 pH*
Minimum Water Absorbing Ability	*200% by weight on oven-dry basis*
Minimum Organic Content	*60% when dried at 221 EF (105 EC)*

c. Composted leaf mulch free of wood, metallic substances, glass or other contaminates may be used in lieu of peat moss or peat humus.

737.07 Fertilizer. Fertilizer shall be a 20-10-5 analysis or approved equal in accordance with the following minimum guaranteed analysis:

Total Nitrogen (N) 20.00%
Derived from urea-formaldehyde
7.0% water soluble nitrogen
13.0% water insoluble nitrogen
Available Phosphoric Acid (P2O5) 10.00%
Derived from calcium phosphate
Soluble Potash (K2O) 5.00%
Derived from potassium sulfate
Combined Calcium (Ca) 2.60%
Derived from calcium phosphate
Combined Sulfur (S) 1.60%
Derived from ferrous and potassium sulfates
Iron (expressed as elemental Fe) 0.35%
Derived from ferrous sulfate

The fertilizer shall be formulated in tablet form weighing a minimum of 20g per tablet.

The fertilizer shall conform to all State and Federal regulations. The Engineer will require the Contractor to furnish an affidavit from the vendor or a testing laboratory as to the available nutrients contained therein.

Fertilizer shall be furnished in new, clean, sealed, and properly labeled packages or containers. Fertilizer failing to meet the specified analysis may be used as determined by the Engineer, providing sufficient materials are applied to comply with the specified nutrients per unit of measure.

737.09 Mulch. Mulch shall be shredded hardwood bark or wood chips, or an approved equal as accepted by the Engineer. All mulching materials will be visually inspected by the Engineer prior to delivery at the planting site and shall conform to the following requirements:

a. Shredded hardwood bark shall be from a deciduous hardwood source and be mechanically ground to a maximum size of 6" (150 mm). In addition, the bark shall be relatively free of bark fines dust and shall exclude all foreign and toxic substances.
b. Wood chips must be stockpiled for at least one year prior to placement as verified by the Department's inspection representative and shall not contain leaves, twigs, wood shavings and sawdust, or any foreign or toxic substances. In addition, loose, non-pelletized fertilizer with analysis in accordance with Subsection 737.07 shall be applied at the rate of 0.5 lb/yd^2 (0.25 kg/ m^2) prior to wood chip placement.

Only one of the above mulches will be selected and approved for use throughout the entire Project, and written certification for the above listed requirements of the mulch shall be submitted by the Contractor.

737.10 Stakes, Guys, and Related Materials. Staking and guying shall be as per the Standard Construction Details or alternate method approved by the Engineer.

a. *Tree Stakes.* Hardwood stakes shall be at least 2” by 2" (50 by 50 mm) rough sawed to the length required. Stakes shall be free from knots, rot or other defects that impair strength.
b. *Guying straps.* Guying straps shall be one and one-half to two inches (1.5-2.0”) wide, of polymer or nylon construction, with grommets at both ends to accept wire or heavy twine.
c. *Anchoring systems.* Anchors for guy wire shall be malleable iron or aluminum alloy with 3000 lb (13 kN) holding capacity designed to be inserted with a driving rod to a depth specified by the manufacturer. The anchor assembly shall be designed to turn, once located at the proper depth, at a right angle to the line of force applied. All manufacturers’ recommendations shall be followed for installing ground anchoring systems.

737.11 Water. Conform to the requirements of Section 803.

CONSTRUCTION METHODS.

737.12 Planting Periods. Plant during the following planting period with the exceptions as noted:

Balled or Burlapped and Potted or Container Grown Plant Material:
March 1 to May 1; September 1 to November 30:

(1) All planting of broadleaf evergreens during the fall season shall be completed by November 1.
(2) All material planted from May 16 to August 31 must be treated with an approved antitranspirant in a manner recommended by the manufacturer, and written approval for moving plants within this period must first be obtained from the Engineer.
(3) Woody Shrub Cuttings Install as dormant materials between October 30 and December 1 or between March 1 and April 1.

The planting periods may be extended or reduced according to weather and soil conditions at the time and upon written request from the Contractor to the Engineer for approval. Planting outside the planting window does not relieve the contractor of his establishment requirements. The Engineer reserves the right to stop planting operations at any time.

The Contractor shall not plant when weather conditions are unfavorable for proper work or when the soil is in a frozen condition.

737.13 Soil Mixture. Soil mixtures for the various plantings shall consist of the following:

a. *All Plants Except Ericaceous Material.* For each cubic yard (cubic meter) of baled peat moss, or approved equal, add from 43 to 54 yd3; (43 to 54 m3) of planting topsoil.

b. *Ericaceous Plants.* For each cubic yard (cubic meter) of baled peat moss, or approved equal, add from 36 to 45 yd3; (36 to 45 m3) of planting topsoil. If peat humus is furnished in lieu of peat moss in the above mix, the mixture shall be based in the proportion of 1.8 yd3; (1.8 m3) of peat humus for each cubic yard (cubic meter) bale of peat moss specified for the above soil mix. Other approved equal materials shall be mixed according to manufacturer's printed recommendations which shall be submitted to the Engineer for written approval.

The above soil mixtures shall be mixed as specified in an area approved by the Engineer. No mix shall be prepared prior to notification of the Engineer at least 48 hours in advance of the mixing operation. Where ground covers or herbaceous perennials are specified, the soil mix may be mixed in place providing the existing topsoil conforms to the requirements of subsection 737.06.

The fertilizer as specified in accordance with Subsection 737.07 shall be placed according to the following requirements:

a. *Balled and Burlapped, or Container Stock.* Position the plant in the hole, and backfill no higher than halfway up the root ball. Place the recommended number of tablets evenly around the perimeter of and immediately adjacent to the root ball. Complete the backfilling, tamping, and watering.
b. *Small Ground Cover Plants and Herbaceous Perennials.* Position the plant in the hole, and backfill no higher than halfway up the root ball. Place the recommended number of tablets evenly around the perimeter of and immediately adjacent to the root ball. Complete the backfilling, tamping, and watering.
c. *Trees.* Use one 20 g tablet for each 1/2" (13 mm) of tree trunk diameter based on size specified for planting.
d. *Shrubs.* Use one 20 g tablet for each 12" (300 mm) of height or spread based on size specified for planting.
e. *Ground Cover and Herbaceous Perennials.* Use one 20 g tablet for each plant.

No backfill shall be placed in any pit until the excavation has been inspected. Excess excavated material shall be removed from the Project site.

737.14 Digging and Handling. All precautions customary in good trade practice shall be taken in preparing plants for transplanting. Plants transplanted with workmanship that fails to meet the highest standards will be rejected. All balled and burlapped plants shall have firm, natural balls of earth of ample proportions and diameter not less than as specified in AAN's "USA Standards for Nursery Stock". Plants with cracked, broken, or crushed balls, which occur either before or during planting operations, will be rejected or shall be removed from the site immediately. All plants shall be handled so that roots are adequately protected and moist at all times. Material that cannot be planted immediately after delivery shall be adequately protected by covering with canvas, wet straw, burlap, moss, or other suitable material and kept covered until ready to be planted. Trees should not be planted with frozen earth balls. Containerized plant material shall be growing in the specified size container for at least six months and shall not display signs of being root bound or unnatural ratio of planting medium vs. root mass.

737.15 Location of Plants. Plants shall be located as indicated on the Plans, but may be shifted to avoid utilities subject to the approval of the Engineer. No excavation shall commence until locations are approved.

737.16 Planting. All trees and shrubs shall be planted in pits as detailed on the Standard Construction Details. Pits shall not be excavated with vertical sides. Pits shall be of such a depth that, when planted and settled, the crown of the plant shall bear the same relation to finished grade as it did to soil surface in its place of growth. With the approval of the Engineer, the Contractor may elect to plant wetland grown containerized shrubs on small mounds raised no more than 2" (50 mm) above the final grading elevation shown on the Plans.

Open plant pits shall not be allowed overnight in residential areas or in any location where it is determined by the Engineer to pose a potential hazard to pedestrians or traffic.

All backfill topsoil shall be covered with a waterproof material after mixing. Pits shall be backfilled with specified soil mix and compacted firmly under ball of roots to establish a firm foundation. Plants shall be set in the center of pits in a vertical position so that the crown of the plant is level with the finished grade after allowing for watering and settling of soil. The "Soil Mixture" shall be carefully and firmly worked and

tamped under and around the base of the ball to fill all voids. When partially backfilled and compacted, the burlap and any wire baskets shall be removed from the sides and tops of the balls and cut away to prevent air pockets, but no burlap shall be pulled from under the balls. All burlap, wire baskets and other containers shall be removed from the jobsite at the end of the workday. The balance of the planting hole shall be filled with the planting mixture and a ring of earth shall be formed around the plant to produce a dish for watering. All plants shall be thoroughly watered immediately after planting as directed by the Engineer. This initial watering shall mean complete saturation of all backfill in the pits and beds during the same day of planting. Care shall be taken during all planting operations to ensure that no excavated material is dumped on any grassed area unless a suitable type of matting or protective underlay is used. The Contractor shall be responsible for all damage to any grassed, planted, or other landscaped area caused by its operations and shall repair any damage so caused in a manner satisfactory to the Engineer.

Ground cover and herbaceous perennial areas shall be prepared by rototilling to a minimum depth of 10" (250 mm). The mixing of peat moss, peat humus, or approved equal may be performed separately in order to obtain the proportion of ground cover or herbaceous perennial soil mixture as specified. Beyond the minimum excavation as stated above for soil mixing, the root system of the plant shall determine the actual depth for individual plant excavation. Plants shall be backfilled with the soil mixture and compact firmly around roots. All areas shall have a smooth and uniform grade and a minimum of 2" (50 mm) of approved mulch.

a. *Pruning.* All plants shall be pruned immediately after planting or transplanting to remove all injured or dead wood. All trees inspected and tagged at the nursery shall conform to AAN Standards, and any subsequent pruning by the Contractor shall in no way alter the natural habit or shape of the plant. All pruning shall be done with sharp tools by workers skilled in this operation. All cuts shall be made flush, leaving no stubs. On all cuts over 3/4" (19 mm) in diameter and bruises or scars on the bark, the injured cambium shall be traced back to living tissue and removed; wounds shall be smoothed and shaped so as to preserve the branch bark ridge.
b. *Watering.* Plants shall be watered on the same day as planting unless otherwise approved by the Engineer. Quantity of water per plant shall be as detailed in Section 737.17.
c. *Mulching.* Trees and shrubs shall be mulched with at least a 4" (100 mm) cover of mulch. Mulch shall be placed the same day of planting, unless otherwise approved by the Engineer.
d. *Wire baskets, nylon binding and treated burlap* shall be cut away and removed from the top half of the root ball.
e. *Staking and Guying.* Unless approved by the Engineer, all staking and guying specified shall be completed the same day as planting and mulching.
f. *Cleaning Up.* Throughout the course of planting, excess and waste materials shall be immediately removed from the site, seeded areas kept clean, and all precautions taken to avoid damage to existing structures, trees, shrubs, plants, and grass. When planting in an area that has been otherwise completed, the area shall, upon completion of the planting, be immediately and thoroughly cleared of all debris, rubbish, subsoil, and all waste materials removed from the site. All ground surfaces shall be raked smooth. All sodded areas disturbed as a result of construction shall be repaired by the Contractor.

737.17 Plant Establishment. The plant establishment period for all planting shall begin immediately after all planting and replacements (as specified under Section 737.16, Planting) are complete and acceptable to the Engineer. The plant establishment period will consist of two full growing seasons during which time the Contractor shall be responsible for all work necessary to keep the plants in a live and healthy condition. A growing season is defined as the period from May 1 through September 30. If the Contractor completes all planting (as specified under Planting) by May 1, the inspection will be held on or about October 1 of that year. In the event the Contractor does not complete all planting by May 1, the inspection will be held on or about October 1 of the following year. All replacement plant material determined to be necessary at the inspection must then be approved at the replacement plant source by October 15. At this time, the Engineer will direct the Contractor to replace those plants determined to be dead or unhealthy by December 1. The Contractor will notify the Engineer in writing that all replacement planting has been accomplished. The Engineer will conduct an inspection within 15 days after such notification to determine the acceptability of the replacements. If all replacements are determined satisfactory by the Engineer, the Contractor will be relieved of all further responsibility for care and replacement.

All planting areas shall be kept free of weeds and grass during the life of the Contract. The Contractor may utilize a pre- or post-emergent herbicide to control such grass and broadleaf weeds incidental to the cost of planting and be totally responsible for the proper use and placement of any such herbicide. As

requested in writing by the Engineer, the Contractor shall be responsible to weed within all plant beds and within the saucer limits of individual plants, beginning 10 calendar days after the date of notification. The Contractor shall prune and apply insecticides or fungicides as required, repair or replace stakes and guy wires, tighten guy cable or wire and repair plant saucer washouts when and as specified by the Engineer.

Any plants that settle below or rise above the desired finished grades shall be reset at the proper grades. All replacements shall be plants of the same kind, size and quality as originally specified in the Contract and they shall be furnished, planted, mulched, guyed, watered, etc. as specified herein for new plant material.

If dead or unhealthy plants are discovered, they shall be removed within 10 calendar days and replaced with the next appropriate planting season.

The Contractor shall be responsible for all damage incurred to plant material, tree protection, wire or staking regardless of the cause.

The cost of the above described work shall be incidental to Section **737**, Planting.
Contractor shall be required to water all major and minor trees, shrubs and all herbaceous beds bi-weekly during the period from May 15 through October 1. Watering, once initiated, shall continue without interruption until all plants on the project have been watered. Payment shall be per 1,000 gals of water applied and shall be based on the following schedule: Major trees-15 gals per tree, minor trees-10 gals per tree, shrubs-5 gals per shrub, perennials-10 gals per 100 square feet of planting bed. Water used for this item shall meet the requirements of Section 803 of the Standard Specifications. Tree watering bags, if utilized, shall be filled as a part of the watering operation; payment shall be as detailed herein. Tree watering bags shall remain the property of the contractor and shall be removed prior to final inspection.

737.18 Method of Measurement. The quantity of planting will not be measured.

737.19 Maintenance Bond. Upon Substantial Completion of the Work, the Contractor shall furnish to the Department a Maintenance Bond on the form provided by the Department for item 737000 - Planting. The Maintenance Bond shall meet the following requirements:

A sum equal to 100% of the value of all Planting Items paid to the Contractor, as detailed in the Breakout Sheet;

All signatures are original signatures, in ink, and not mechanical reproductions or facsimiles of any kind;

The Contractor is the named principle;

Section 737.17 – Plant Establishment Work items associated with this section requires completion after substantial completion of the Project. The term of the Maintenance Bond will be for a period of two full growing seasons, as defined in the section, beyond the completion of permanent planting Work; and Written by a Surety or insurance company that is in good standing and currently licensed to write surety bonds in the State of Delaware by the Delaware Department of Insurance.

737.20 Basis of Payment.

The quantity of planting will be paid for at the Contract lump sum. Price and payment will constitute full compensation for furnishing and placing all materials, including plants, soil mixes, and mulch; for protecting plants after digging and prior to planting; for staking, excavating plant pits, pruning, and guying; for watering until final acceptance as separate pay item, for the cultural care of the plants until the completion and acceptance of all landscape work; for disposing of excess and waste materials; for replacement planting; for cleanup; for repairs to plant material, tree protection, wire, or staking due to fire, theft, vehicular damage, or acts of vandalism; for repairs to damaged grassed, planted, or other landscaped area due to the Contractor's operations; for ensuring that topsoil meets the sieve analysis, acidity, and organic matter requirements; for applying sufficient materials to fertilizer that originally failed to meet the specified analysis; for using pre- or post-emergent herbicide to control grass and weeds; for the work outlined under Subsection 737.17; and for all labor, equipment, tools and incidentals required to complete the work.

The breakout sheet attached to the proposal shows all plant material proposed for this Contract. The Contractor shall fill in the per each unit price and the cost (unit price times the proposed quantity) for each item listed. The lump sum price bid for 737523 - Planting shall be the sum of the total cost for all species and

sizes listed. The completed typewritten breakout sheet shall be attached to the bid proposal. Failure to submit the breakout sheet with the Bid Proposal will result in the Bid Proposal being declared non-responsive and rejected.

The Department reserves the right to delete from the Contract the furnishing and installing of one or more of the species and/or sizes listed and the right to add or subtract from the quantity of each species and size listed. The lump sum to be paid will be adjusted in accordance with the Contractor's unit prices as required above. There will be no extra compensation to the Contractor if such additions and/or deletion are made. Watering item shall be paid separately for watering completed at the bid priced indicated on the Breakout Sheet.

Payment for the planting as described above may be processed if, in the opinion of the Engineer all work required, except that specified under Subsection 737.17 is satisfactorily completed. No partial payment will be made for any living plant until and unless planted in accordance with these specifications. No additional payment will be made for using plants larger than specified.
On contracts where assessment of time is in working days, the Contractor will be charged working days while engaged in actual planting and directly related work such as plant pit excavation, staking, wrapping, and mulching. The Contractor will not be charged time for indirectly related work such as watering, weed control, pruning, and other responsibilities as described under Subsection 737.17

The cost to remove and replace plants that settle below or rise above the desired finished grades, or that die or are unhealthy as described in Subsection 737.17 shall be the responsibility of the Contractor.

3/20/13

743539 - WOODEN SIGN SUPPORTS, 4" x 6"

Description:

This work consists of furnishing and placing 4”x6” wooden sign support(s) for campground markers and in accordance with these Specifications and in reasonably close conformity with the lines, grades, dimensions, and locations shown on the Plans or established by the Engineer. The item(s) shall also include, but not be limited to, excavation of the foundation and placing of foundation backfill, as may be required to complete the work as indicated on the Plans or as directed by the Engineer. Signs mounted on the wooden sign support shall be furnished and installed by others.

Materials:

Wooden sign support(s) shall be nominal size 4” x 6. All wooden sign support(s) shall be pressure treated wood with ACQ treatment and have a minimum retention of 0.40 pcf.

Construction Methods:

Wooden Sign Supports shall be placed in pre-excavated foundation holes of the width and depth shown on the plans.

The support shall be installed plumb and true in the foundation and backfilled with material meeting the requirements of Borrow, Type C. When backfilling the Wooden Sign Supports, borrow shall be placed in six (6) inch (150 mm) lifts and compacted thoroughly in order to achieve maximum compaction.

Method of Measurement:

The quantity of wooden sign supports will be measured as the actual number of each wooden support placed and accepted.

Basis of Payment:

The quantity of wooden sign supports will be paid for at the Contract unit price each. Price and payment will constitute full compensation for the excavation and preparation of the foundation; for furnishing and installing all materials including Wooden Sign Supports; Borrow, Type C; and for all labor, equipment, tools and incidentals necessary to complete the work.

2/18/13

748506 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 4"
748507 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 6"
748508 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 8"
748509 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 12"
748510 - PERMANENT PAVEMENT STRIPING, SYMBOL/LEGEND, EPOXY RESIN PAINT
748535 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, BLACK, 4"
748536 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, BLACK, 6"
748537 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, BLACK, 8"
748538 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, BLACK, 10"
748539 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, BLACK, 12"
748540 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, BLACK, 16"
748548 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 5"
748549 -PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 10"
748557 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, BLACK, 3"
748559 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, BLACK, 5"
748568 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, BLACK, 9"
748569 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, BLACK, 14"

Description:

This work consists of striping layout,furnishing and applying white or yellow, epoxy reflectorized pavement markings or black epoxy contrast pavement markings at the locations and in accordance with the patterns indicated on the Plans, or as directed by the Engineer, and in accordance with these specifications.

The white/yellow epoxy marking material shall be hot-applied by spray methods onto bituminous and/or Portland cement concrete pavement surfaces as required by the Plans. Following an application of double drop glass beads of two sizes and upon curing, the resultant epoxy marking shall be an adherent reflectorized stripe of the specified thickness and width that is capable of resisting deformation by traffic.
All marking materials shall be certified lead free and free of cadmium, mercury, hexvalent chromium, and other toxic heavy metals.

The black epoxy marking shall be a two-component, hot-spray applied epoxy resin pavement marking material to be used for pavement marking on Portland cement concrete pavement surfaces. Following an aggregate drop, and upon curing, it shall produce an adherent stripe of specified thickness and width capable of resisting wear from traffic. Black contrast pavement markings will be required on all Portland cement concrete pavements.

Materials Requirements:

A. White and Yellow Reflectorized Epoxy

1. Epoxy Composition Requirements:

The epoxy resin composition shall be specifically formulated for use as a pavement marking material and for hot-spray application at elevated temperatures. The type and amounts of epoxy resins and curing agents shall be at the option of the manufacturer, providing the other composition and physical requirements of this specification are met.

The epoxy marking material shall be a two-component (Part A and Part B), 100% solids type system formulated and designed to provide a simple volumetric mixing ratio (e.g. two volumes of Part A to one volume of Part B).

Component A of both white and yellow shall conform to the following requirements:

	% BY WEIGHT	
	WHITE:	**YELLOW:**
Pigments	Titanium Dioxide - 18% Min. (ASTM D476, Type II)	Organic Yellow - 6%-10%
Epoxy Resin	75% Min., 82% Max.	70% Min., 77% Max.

The entire pigment composition shall consist of either titanium dioxide and/or organic yellow pigment. No extender pigments are permitted. The white pigment upon analysis, shall contain a minimum of 16.5% TiO_2 (100% purity).

Epoxy Content-WPE (Component A) - The epoxy content of the epoxy resin will be tested in accordance with ASTM D1652 and calculated as the weight per epoxy equivalent (WPE) for both white and yellow. The epoxy content will be determined on a pigment free basis. The epoxy content (WPE) shall meet a target value provided by the manufacturer and approved by the Department's Material and Research Section (from now on will be addressed as Department). A $\pm$ 50 tolerance will be applied to the target value to establish the acceptance range.

Amine Value (Component B) - The amine value of the curing agent shall be tested in accordance with ASTM D2074-66 to determine its total amine value. The total amine value shall meet a target value provided by the manufacturer and approved by the Department. A $\pm$50 tolerance will be applied to the target value to establish the acceptance range.

Toxicity - Upon heating to application temperature, the material shall not exude fumes which are toxic or injurious to persons or property.

Viscosity - Formulations of each component shall be such that the viscosity of both components shall coincide (within 10%) at a recommended spray application.

2. Physical Properties of Mixed Composition:

Unless otherwise noted, all samples are to be prepared and tested at an ambient temperature of 73 ± 5 F. (23 ± 3 C).

a. Color. The white epoxy composition when applied at a minimum wet film thickness of 20$\pm$1 mils (500 µm) as applicable and allowed to dry, shall plot within the boundaries described by the four corner points listed in Tables 1 and 2 of ASTM D 6628-01 when measured in accordance with the test methods prescribed in Section 7 of ASTM D 6628-01.

The yellow epoxy composition when applied at a minimum wet film thickness of 20$\pm$1 mils (500 µm) as applicable and allowed to dry, shall plot within the boundaries described by the four corner points listed in Tables 1 and 2 of ASTM D 6628-01 when measured in accordance with the test methods prescribed in Section 7 of ASTM D 6628-01.

b. Directional Reflectance. The white epoxy composition (without glass spheres) shall have a daylight directional reflectance of not less than 84% relative to a magnesium oxide standard when tested in accordance with Method 6121 of Federal Test Method Standard No. 141.

The yellow epoxy composition (without glass spheres) shall have a daylight directional reflectance of not less than 55% relative to a magnesium oxide standard when tested in accordance with Method 6121 of Federal Test Method Standard No. 141.

c. Drying Time (Laboratory). The epoxy composition, when mixed in the proper ratio and applied at a 20$\pm$1 mils (500 µm) minimum wet film thickness, and immediately dressed with large reflective glass spheres (Federal Spec. Type 4)at a rate of 12 lb/gal (1.4 kg/l) of epoxy pavement marking materials, immediately followed by a second drop of AASHTO M-247 Type 1 glass spheres applied at a rate of 12 lb/gal (1.4 kg/L) of epoxy pavement marking material, shall exhibit a no-track condition in 15 minutes or less (ASTM D711). A Bird Applicator or any other doctor blade shall be used to produce a uniform film thickness.

d. Drying Time (Field). When installed at a minimum wet film thickness of 20±1 mils (500 or 625 um) and reflectorized with glass spheres, the maximum drying times shall correspond to these temperatures:

80 F (27 C) 10 minutes
70 F (21 C) 10 minutes
60 F (16 C) 15 minutes
50 F (10 C) 25 minutes
40 F (4 C) 45 minutes
35 F (2 C) 60 minutes

The composition shall dry to "no-tracking" in approximately 10 minutes, and after thirty (30) minutes shall show no damaging effect from traffic. Dry to no-tracking shall be considered as the condition where no visual deposition of the epoxy marking to the pavement surface is observed when viewed from a distance of 100 feet (30 meters), after a passenger car is passed over the line. Regardless of the temperature at the time of installation, the installation contractor shall be responsible for protection of the markings material until dry to a non-tracking state.

e. Abrasion Resistance. The wear index of the composition shall not exceed 82 when tested in accordance with ASTM C501 using a CS-17 wheel and under a load of 1000 grams for 1000 cycles.

f. Tensile Strength. The tensile strength of the epoxy composition shall not be less than 6000 psi (41 MPa) when tested in accordance with ASTM D638 using a Type IV specimen [0.125" ± 0.010" (3.18 ± 0.25 mm) thick]. Tests shall be conducted at an ambient temperature of 75 ± 5 F (24 ± 3 C). The testing machine shall operate at a speed of 0.20" (5.1 mm) per minute.

The total conditioning or drying period, from the time the epoxy composition is first mixed to the time of testing, shall not be less than 24 hours nor more than 96 hours.

Test specimens for tensile strength determination will be prepared as follows:

A 1/8 inch (3 mm) thick sheet of epoxy material is cast from a reservoir-type mold, fabricated from polyterrafluorethylene (PTFE), 1/8" deep x 10" x 10" (3 mm deep x 250 mm x 250 mm).

Prior to casting, the mold is sprayed with a suitable release agent. A sufficient amount of epoxy composition is mixed in the proper proportions (A:B) and poured level with the top of the mold. Care should be taken so as not to decrease or exceed the 1/8" (3 mm) thickness.

After a period of 1 to 4 hours, the material will have set into a semi-rigid sheet that is flexible enough to die-cut yet rigid enough to retain its shape. While the material is in this "plastic" state, five (5) specimens shall be die-cut and then placed on a flat, smooth, PTFE surface for the completion of the specified conditioning period.

g. Compressive Strength. The compressive strength of the epoxy composition shall not be less than 12,000 psi (83 MPa) when tested in accordance with ASTM D695 except that a compression tool shall not be necessary. The test specimen shall be a right cylinder [0.50 inch diameter by 1.0 inch length (12 mm diameter by 25 mm length)]. Tests shall be conducted at an ambient temperature of 75 ± 5 F (24 ± 3 C).

The total conditioning or drying period, from the time the epoxy composition is first mixed to the time of testing shall not be less than 24 hours nor more than 96 hours.

Test specimens for compressive strength determinations will be prepared as follows:

Five molds will be prepared from 1/2" (12 mm) I.D., 1/16" (1.5 mm) wall thickness acrylic tubing, cut in 1 1/2" (38 mm) lengths. After spraying the inside of the mold with a suitable release agent,[1] the cylindrical tubes are placed in a vertical position

on a PTFE sheet base. A sufficient amount of epoxy composition is thoroughly mixed in the proper proportions (A:B) and poured into the mold to a depth of approximately 1 1/4" (32 mm). After a minimum of 72 hours curing, the specimens are removed from the molds and machined to a length of 1" ± 0.002" (25 mm ± 0.05 mm).

h. Hardness. The epoxy composition when tested in accordance with ASTM D2240 shall have a Shore D hardness of between 75 and 100. Samples shall be allowed to dry for not less than 24 hours nor more than 96 hours prior to testing.

B. Reflective Glass Spheres/Beads

Reflective glass spheres for drop-on application shall conform to the following requirements:

The glass spheres shall be colorless; clean; transparent; free from milkiness or excessive air bubbles; and essentially clean from-surface scarring or scratching. They shall be spherical in shape and at least 80% of the glass beads shall be true spheres when tested in accordance with ASTM D1155. At least 80% of the Type IV beads shall be true spheres as measured by the visual method.

The refractive index of the spheres shall be a minimum of 1.50 as determined by the liquid immersion method at 77 F (25 C).

The silica content of the glass spheres shall not be less than 60%.

The crushing resistance of the spheres shall be as follows: A 40 lb. (18 kg) dead weight, for 20 to 30 (850 µm to 600 µm) mesh spheres shall be the average resistance when tested in accordance with ASTM D1213.

The glass spheres shall have the following grading when tested in accordance with ASTM D1214.

M247 AASHTO Type 1 Glass Spheres

U.S. Standard Sieve	% Retained	% Passing
#20 (850µm)	0	100
#30 (600µm)	5-25	75-95
#50 (300µm)	40-65	15-35
#100 (150µm)	15-35	0-5
Pan	0-5	

Type 4 Large Spheres

U.S. Standard Sieve	% Retained	% Passing
#10 (2000 µm)	0	100
#12 (1680 µm)	0-5	95-100
#14 (1410 µm)	5-20	80-95
#16 (1190 µm)	40-80	10-40
#18 (1000 µm)	10-40	0-5
#20 (850 µm)	0-5	0-2
Pan	0-2	

The AASHTO M247 Type 1 glass spheres shall be treated with a moisture-proof coating. They shall show no tendency to absorb moisture in storage and shall remain free of clusters and hard lumps. They shall flow freely from dispensing equipment at any time when surface and atmosphere conditions are satisfactory for marking operations. The moisture-resistance of the glass spheres shall be determined in accordance with AASHTO M247 test method 4.4.1.

Type IV glass spheres shall be treated with an adhesion coating. They shall show no tendency to absorb moisture in storage and shall remain free of clusters and hard lumps. They shall flow freely from dispensing equipment at any time when surface and atmosphere conditions are satisfactory for

marking operations. The adhesion coating property of the Type IV beads shall be tested in accordance with the dansyl-chloride test.

C. Black Epoxy Contrast Markings

Epoxy Resin Requirements: The two-component, 100% solids, paint shall be formulated and designed to provide a simple volumetric mixing ratio (e.g. 2 part component A to 1 part component B) specifically for service as a hot-spray applied binder for black aggregate in such a manner as to produce maximum adhesion. The material shall be composed of epoxy resins and pigments only.

The paint shall be well mixed in the manufacturing process and shall be free from defects and imperfections that may adversely affect the serviceability of the finished product. The paint shall not thicken, curdle, gel, settle excessively, or otherwise display any objectionable properties after storage. Individual components shall not require mixing prior to use when stored for a maximum of 6 months.

The overall paint composition shall be left to the discretion of the manufacturer, but shall meet the following requirements:

Composition:	Component	Percent By Weight
	Carbon Black (ASTM D476 Type III)	7±2 percent, by weight
	Talc	14±2 percent, by weight
	Epoxy Resin	79±4 percent, by weight

D. Black Aggregate

The moisture resistant aggregate shall meet the gradation requirements (AASHTO T27) as follows:

Sieve Size	Percent Retained
#30	18-28%
#40	60-80%
#50	2-14%

The moisture resistant aggregate shall have a ceramic coating. The aggregate shall be angular with no dry dispensement pigment allowed.

Hardness:	The black aggregate hardness shall be 6.5-7 on Moh's Mineral Scale.
Porosity:	The black aggregate porosity shall be less than two (2) percent.
Moisture Content:	The black aggregate moisture content shall be less than a half (.5) percent.

E. Packaging and Shipment

Epoxy pavement marking materials shall be shipped to the job site in strong substantial containers. Individual containers shall be plainly marked with the following information:

a. Name of Product
b. Lot Number
c. Batch Number
d. Test Number
e. Date of Manufacture
f. Date of expiration of acceptance (12 months from date of manufacture)
g. The statement (as appropriate)
   Part A - Contains Pigment & Epoxy Resin
   Part B - Contains Catalyst
h. Quantity
i. Mixing proportions, Application Temperature and Instructions

j. Safety Information
k. Manufacturer's Name and Address

Reflective glass spheres shall be shipped in moisture resistant bags. Each bag shall be marked with the name and address of the manufacturer and the name and net weight of the material.

F. The Department reserves the right to randomly take a one-quart sample of white, yellow and hardener, of the epoxy material or glass spheres without prior notice for testing to ensure the epoxy material meets specifications.

Epoxy Application Equipment:

Application equipment for the placement of epoxy reflectorized pavement markings shall be approved by the Department, prior to the start of work.

At any time throughout the duration of the project, the Contractor shall provide free access to his epoxy application equipment for inspection by the Engineer or his authorized representative.

In general, the application equipment shall be a mobile, truck mounted and self contained pavement marking machine, specifically designed to apply epoxy resin materials and reflective glass spheres in continuous and skip-line patterns. The application equipment shall be maneuverable to the extent that straight lines can be followed and normal curves can be made in a true arc. In addition, the truck mounted unit shall be provided with accessories to allow for the marking of legends, symbols, crosswalks, and other special patterns.

The Engineer may approve the use of a portable applicator in lieu of truck mounted accessories, for use in applying special markings only, provided such equipment can demonstrate satisfactory application of reflectorized epoxy markings in accordance with these specifications.

The applicator shall be capable of installing up to 20,000 lineal feet (6,100 lineal meters) of epoxy reflectorized pavement markings in an 8-hour day and shall include the following features:

1. The applicator shall provide individual material reservoirs, or space, for the storage of Part A and Part B of the epoxy resin composition; for the storage of water; and for the storage of reflective glass spheres.

2. The applicator shall be equipped with heating equipment of sufficient capacity to maintain the individual epoxy resin components at the manufacturer's recommended temperature for spray application and for heating water to a temperature of approximately 140 F (60 C).

3. The glass spheres shall be gravity dropped upon 20 mils (500 um) of epoxy pavement markings to produce a wet-night-reflective pavement marking. The large spheres (Federal Spec. Type 4) shall be applied at a rate of 12 pounds per gallon (1.4 kg/L) of epoxy pavement marking material, immediately followed by a second drop of AASHTO M-247 Type 1 glass spheres applied rate of 12 pounds per gallon (1.4 kg/L) of epoxy pavement marking material. This application rate and the following gradation shall conform to FHWA's FP-96: Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (pages 757-761 Type 3 and Type 4 Beads).

4. The applicator shall be equipped with metering devices or pressure gauges, on the proportioning pumps. Metering devices or pressure gauges shall be visible to the Engineer.

5. The applicator shall be equipped with all the necessary spray equipment, mixers, compressors, and other appurtenances to allow for the placement of epoxy reflectorized pavement markings in a simultaneous sequence of operations as described below in Construction Details, D. Applications of Epoxy Reflectorized Pavement Markings of this Special Provisions.

Construction Details.

A. General: All pavement marking and patterns shall be placed as shown on the Plans or as directed by the Engineer.

Before any pavement markings work is begun, a schedule of operations shall be submitted for the approval of the Engineer. This schedule shall be submitted 2 weeks prior to the application of the striping.

At least five (5) days prior to starting striping the Contractor shall provide the Engineer with the epoxy manufacturer's written instructions for use. These instructions shall include but not be limited to: mixing ratios, application temperatures, and recommendations for use of water spray.

The application of pavement markings shall be done in the general direction of traffic. Striping against the direction of traffic flow shall not be allowed.

The Contractor shall be responsible for removing, to the satisfaction of the Engineer, tracking marks, spilled epoxy or epoxy markings applied in unauthorized areas.

The hot water spray shall not be used in conjunction with markings applications on any pavement surface, or on any existing durable type marking, unless specifically recommended by the manufacturer of the epoxy material.

B. Atmospheric Conditions: Epoxy pavement markings shall only be applied during conditions of dry weather and on substantially dry pavement surfaces. At the time of installation the pavement surface temperature shall be a minimum of 35 F (2 C) and the ambient temperature shall be a minimum of 35 F (2 C) and rising. The Engineer shall be the sole determiner as to when atmospheric conditions and pavement surface conditions are such to produce satisfactory results.

C. Surface Preparations: The Contractor shall clean the pavement or existing durable marking to the satisfaction of the Engineer.

Surface cleaning and preparation work shall be performed only in the area of the epoxy markings application.

At the time of application all pavement surfaces and existing durable markings shall be free of oil, dirt, dust, grease and similar foreign materials. The cost of cleaning these contaminants shall be included in the bid price of this item. Also, the item shall include the cost of removal of the curing component in the area of the epoxy markings application, if concrete curing compounds on new portland cement concrete surfaces have been used. Waterblasting will not be permitted for removal.

D. Application of White/Yellow Epoxy Reflectorized Pavement Markings: White/yellow epoxy reflectorized pavement markings shall be placed at the widths and patterns designated on the Contract Plans.

Markings operations shall not begin until applicable surface preparation work is completed, and approved by the Engineer.

White/yellow epoxy pavement markings shall be applied at a minimum uniform thickness of 20 mils (500 µm) on all Portland cement concrete and bituminous concrete pavement, including Stone Matrix Asphalt.

Large reflective glass spheres (Federal Spec. Type 4) shall be applied at the rate of 12 pounds per gallon (1.4 kg/L) of epoxy pavement marking material, immediately followed by a second drop of AASHTO M-247 Type 1 glass spheres applied at a rate of 12 pounds per gallon (1.4 kg/L) of epoxy pavement marking material. Glass spheres shall uniformly cover the length and width of the pavement marking.

E. Application of Black Epoxy Contrast Pavement Markings: Black epoxy contrast pavement markings shall be placed at the widths designated on the Contract Plans.

Markings operations shall not begin until applicable surface preparation work is completed, and approved by the Engineer.

Black epoxy contrast pavement markings shall be applied at a minimum uniform thickness of 20 mils (500 µm) on all Portland cement concrete surfaces followed by a single drop of graded black aggregate.

The width of black epoxy line shall be applied for the following situations:

Center Skip Line - On Portland cement concrete pavements a black contrast skip line shall be 10 feet (3 m) in length of the same width as the white epoxy reflectorized skip. It is to lead the white skip and stop at the beginning of the white skip. The black contrast skip is to have a single application of graded black aggregate.

Edge Lines - All edge lines on Portland cement concrete pavements shall have a base of black contrast markings which is 4 inches (100 mm) wider than the reflective white or yellow marking. The black contrast marking is to be applied first with a single drop of graded black aggregate. Once it has cured sufficiently so as not to track, the reflectorized white or yellow line is to be applied on top of it. The reflective line is to be centered along the black contrast line such that a minimum of 2 inches (50 mm) of black contrast marking is visible on either side of the reflective marking.

F. Defective Epoxy Pavement Markings: Epoxy reflectorized pavement markings, which after application and curing are determined by the Engineer to be defective and not in conformance with this specification, shall be repaired. Repair of defective markings shall be the responsibility of the Contractor and shall be performed to the satisfaction of the Engineer as follows:

1. Insufficient film thickness [(less than 20±1 mils (500 µm) as applicable] and line widths; insufficient glass bead coverage or inadequate glass bead retention.

   Repair Method: Prepare the surface of the defective epoxy marking by shot blasting, sand blasting, or water blasting. No other cleaning methods will be allowed. Surface preparation shall be performed to the extent that a substantial amount of the reflective glass spheres are removed and a roughened epoxy marking surface remains.

   Immediately after surface preparation remove loose particles and foreign debris by brooming or blasting with compressed air.

   Repair shall be made by re-striping over the cleaned surface, in accordance with the requirements of this specification and at a full 20±1 mils (500 µm) minimum line thickness as applicable.

2. Uncured or discolored epoxy (brown patches); insufficient bond to pavement surface (or existing durable marking).

   Uncured epoxy shall be defined as applied material that fails to cure (dry) in accordance with the requirements of this specification under MATERIALS, A, 2d. DRYING TIME (FIELD); or applied material that fails to cure (dry) within a reasonable time period under actual field conditions, as defined by the Engineer.

   Discoloration (brown patches) shall be defined as localized areas or patches of brown or grayish colored epoxy marking material. These areas often occur in a cyclic pattern and also, often are not visible until several days or weeks after markings are applied.

   Repair Method: The defective epoxy marking shall be completely removed and cleaned to the underlying pavement surface to the satisfaction of the Engineer.

   The extent of removal shall be the defective area plus any adjacent epoxy pavement marking material extending one foot (300 mm) any direction.

   After surface preparation work is complete, repair shall be made by re-applying epoxy over the cleaned pavement surface in accordance with the requirements of this specification.

3. Reflectivity for epoxy resin paint.

After satisfactory completion of all striping work and written notification from the Contractor, the Department shall test the striping to ensure it has the minimum reflectivity. The testing will be completed within 30 calendar days from notification. The Contractor may request that tests be conducted on completed phases or portions of the work. Approval of such a request will be at the discretion of the Engineer. Testing will be done using a LTL-X Retrometer (30 meter geometry). Five readings will be taken per line per mile (1.6 km). Projects less than 1 mile (1.6 km) in length will have a minimum of 5 readings per line. These readings will then be averaged for the overall project average.

The required average minimum initial reflectivity reading in millicandellas shall be:

White 450
Yellow 325

Any single reading shall not be less than 350 millicandellas for white and 250 millicandellas for yellow. Without exception, any pavement markings installed that does not meet the above average minimum initial reflectivity numbers shall be removed and replaced, at the installation contractor's expense.

Other defects not noted above, but determined by the Engineer to need repair, shall be repaired or replaced as directed by and to the satisfaction of the Engineer.

All work in conjunction with the repair or replacement of defective epoxy reflectorized pavement markings shall be performed by the Contractor at no additional cost to the State.

Method of Measurement:

The quantity of permanent pavement striping (white, yellow, or black epoxy resin paint) will be measured by the number of linear feet (meters) of pavement striping line and number of square feet (meter) of symbol installed on the pavement and accepted in accordance with the Plans.

Basis of Payment:

The quantity of permanent pavement striping (white, yellow, or black epoxy resin paint) payment will be paid for at the Contract unit price per linear foot (meter) for 3", 4", 5", 6", 8", 9", 10", 12", 14", 16" (75 mm, 100 mm, 125 mm, 150 mm, 200 mm, 225 mm, 250 mm, 300 mm, 350 mm, or 400 mm) line and the Contract unit price per square foot (meter) of symbol. The quantity of permanent pavement marking (white, yellow, or black epoxy resin paint) will be paid for at the Contract unit price per linear foot (meter) of line and the Contract unit price per square foot (meter) of symbol. Price and payment shall include striping layout, cleaning and preparing the pavement surface, and placing all materials, for all labor, tools, equipment and incidentals necessary to complete the work.

NOTE:

For information only:

The following manufacturers are known to us which manufacturer Epoxy Resin Paint for Pavement Striping. The Department does not endorse or require the use of any of the manufacturers listed below. However, a bidder wishes to use another manufacturer's product, it shall be submitted for review and approval prior to submitting a bid proposal. Should the product be deemed unacceptable by the Department, the successful bidder will be required to use only an approved product.

1. POLY CARB, Inc.
   33095 Bainbridge Road
   Solon, Ohio 44139
   Tel. 1-800-CALLMIX

2. IPS - Ennis Paint
   P.O. Box 13582
   Research Triangle Park, North Carolina 27709
   Tel. 1-877-477-7623

3. Epoplex
   One Park Avenue
   Maple Shade, NJ 08052
   Tel. 1-800-822-6920

4. Or an approved equal.

2/14/12

748530 - REMOVAL OF PAVEMENT STRIPING

Description:

This work consists of removing pavement markings of all kinds including paint, tape, etc., in accordance with this special provision, notes on Plans and/or as directed by the Engineer. The Contractor shall coordinate with the Engineer for maintaining traffic during the operation, prior to starting the work.

Materials and Construction Methods:

Paint and Epoxy Resins:

Shot/abrasive grit blasting or water blasting equipment shall be used for removal of markings from pavement surfaces.

Alkyd Thermoplastic:

In addition to the removal techniques discussed for paint and epoxy, burning or grinding (erasing machines) equipment may also be used for removal of markings from pavement surfaces.

The removal operation shall be performed in a manner that will not damage the pavement surface.

The Contractor shall collect and dispose of all shot/abrasive grit and pavement marking materials removed from the pavement surface. Washing or sweeping such material to the roadside will not be permitted.

After removal of striping on bituminous concrete, approved flat black paint or asphalt sealer shall be used to cover any exposed aggregate or embedded paint at no additional cost.

Method of Measurement:

The quantity of pavement striping removal will be measured as the number of square feet (meters) of pavement striping removed and accepted. The area of lines will be calculated by multiplying the nominal width of line times the length and the area of symbols will be as specified in Subsection 748.10 of the Standard Specifications.

Basis of Payment:

The quantity of pavement striping removal will be paid for at the Contract unit price per square foot (meter) for "Removal of Pavement Striping". Price and payment shall be full compensation for furnishing all materials, removing the pavement markings, disposing of the removed marking material, covering up the exposed aggregate, and for all labor, equipment, tools and incidentals necessary to complete the work.

Note:

There will be no measurement and payment for removal of pavement markings placed incorrectly by the Contractor.

01/09/06

749687 - INSTALLATION OR REMOVAL OF TRAFFIC SIGN ON SINGLE SIGN POST

Description:

This work consists of installing or removing traffic sign(s) on a single post at the locations indicated on the Plans or as directed by the Engineer. This specification also includes installation of posts in boring holes constructed under other items.

A single sign totaling more than 9 square feet, or with any dimension, length or width, greater than or equal to 48 inches shall be installed on multiple sign posts under Item 749690 - Installation or Removal of Traffic Sign on Multiple Sign Posts.

Materials:

The Department will provide all sign materials to be used on this project. The Contractor shall contact the DelDOT Sign Shop Supervisor with project plans and quantity sheets at 302-760-2581. Sign fabrication orders require a minimum of four (4) weeks for completion. Orders placed with less than 4 weeks lead-time will result in a delay. Any delay caused by inadequate lead-time due to a late order will be the sole responsibility of the Contractor. The Contractor shall pick-up the sign materials from the DelDOT Sign Shop and deliver them to the job site without any damage to the sign materials.

Construction Methods:

The Contractor shall pick-up necessary signs, sign posts, hardware, and extensions from the Department and install the signs in the locations indicated on the Plans in accordance with the DelDOT MUTCD or as directed by the Engineer. The Contractor shall be responsible for obtaining all necessary utility clearances before the signs may be installed. For sign removals, the sign posts shall have all nuts, bolts, and other connectors removed. The disturbed ground shall be graded and backfilled accordingly. All signing materials removed from the project shall be returned to the DelDOT Sign Shop without any damage to the sign materials.

Method of Measurement:

The number of single sign installations or removals will be measured as the actual number of sign posts installed or removed and accepted.

Basis of Payment:

The quantity of single sign post installations or removals will be paid for at the Contract unit price per each. Price and payment will constitute full compensation for installing or removing signs and sign materials, pick-up and delivery of sign materials, grading disturbed areas, and for all labor, equipment, tools, and incidentals required to complete the work. Signs that are not installed in accordance with the DelDOT MUTCD or signs installed in the incorrect location shall be moved at no additional cost to the Department.

2/2/11

749690 - INSTALLATION OR REMOVAL OF TRAFFIC SIGN ON MULTIPLE SIGN POSTS

Description:

This work consists of installing or removing traffic sign(s) on multiple sign posts at the locations indicated on the Plans or as directed by the Engineer. This specification also includes installation of posts in holes installed under other items.

A single sign totaling more than 9 square feet, or with any dimension, length or width, greater than 48 inches shall be mounted on two (2) posts. Signs with a length greater than or equal to 78 inches shall be mounted on three (3) sign posts.

Materials:

The Department will provide all sign materials to be used on this project. The Contractor shall contact the DelDOT Sign Shop Supervisor with project plans and quantity sheets at 302-760-2581. Sign fabrication orders require a minimum of four (4) weeks for completion. Orders placed with less than 4 weeks lead-time will result in a delay. Any delay caused by inadequate lead-time due to a late order will be the sole responsibility of the Contractor. The Contractor shall pick-up the sign materials from the DelDOT Sign Shop and deliver them to the job site without any damage to the sign materials.

Construction Methods:

The Contractor shall pick-up necessary signs, sign posts, hardware, and extensions from the Department and install the signs in the locations indicated on the Plans in accordance with the DelDOT MUTCD or as directed by the Engineer. The Contractor shall be responsible for obtaining all necessary utility clearances before the signs may be installed. For sign removals, the sign posts shall have all nuts, bolts, and other connectors removed. The disturbed ground shall be graded and backfilled accordingly. All signing materials removed from the project shall be returned to the DelDOT Sign Shop without any damage to the sign materials.

Method of Measurement:

The number of sign installations or removals will be measured as the total square foot of the sign(s) installed or removed and accepted.

Basis of Payment:

The quantity of sign installations or removals will be paid for at the Contract unit price per square foot. Price and Payment will constitute full compensation for installing or removing signs and sign materials, pick-up and delivery of sign materials, grading disturbed areas, and for all labor, equipment, tools, and incidentals required to complete the work. Signs that are not installed accordance with the DelDOT MUTCD or signs installed in the incorrect location shall be moved at no additional cost to the Department.

2/2/11

753516 - SANITARY SERVICE SYSTEM

Description:

This work consists of furnishing and installing all gravity sewer pipe and fittings, sewer connections, concrete encasements, sewer manholes, sewer cleanouts and related concrete pads, pavement removal and replacement, excavation, backfill, compaction, dewatering, completing all connections to existing sewers as shown in the Contract Drawings, furnishing all necessary borrow material, proper disposal of all excess material and construction of debris and furnishing and installing all services, equipment, materials and labor necessary for the complete and proper installation of the gravity sewer as indicated in the Sussex County Ordinance 38/ Contract Documents.

Materials:

Gravity sewer pipe shall be manufactured in accordance with ASTM D-3034, SDR 35 Specification for Type PSM Poly (vinyl chloride) (PVC) Sewer Pipe and Fittings, utilizing a rubber ring joint to provide for expansion and contraction.

The standard laying length shall be 20 feet, or 12-1/2 feet with average outside diameter and wall thickness as follows:

Diameter	4”	6”	8”	10”	12”	15”
Average O.D.	4.125	6.275	8.40	10.5	12.5	15.3
Wall Thickness 0.125	0.180	0.240	0.30	0.36	0.474	

The Contractor shall provide a minimum SDR ratio of 35 and a minimum “Pipe stiffness” of F/AY=46 when measured at 5 percent deflection then calculated in accordance with ASTM 2412 “External Loading Properties of Plastic Pipe by Parallel Plate Loading.”

Joints for both pipe and fittings shall be of the integral bell type, consisting of an integral wall section with a solid cross-section rubber ring, factory assembled and securely locked in place to prevent displacement.

Rubber gaskets shall comply in all respects with the physical requirements specified in ASTM F-477 and the lubricant used for joint assembly shall have no detrimental effect on the ring or pipe.

Portland Cement for thrust blocks and encasements shall conform to ASTM C150 for Type II and shall have a minimum compressive strength of 4000 psi at 28 days, unless otherwise noted on the plans. The use of anti-freeze compounds, salts, chemicals or other foreign materials, for the purpose of lowering the freezing point of the concrete is prohibited. No calcium chloride or ingredients containing chlorides shall be mixed in any concrete.

All concrete (when temperatures are above 55 F.) shall have a water reducing and retarding admixtures. When temperatures are below 54 F a water reducing admixture shall be used. The water reducing and retarding mixture shall conform to ASTM C494-71 for Type ‘D’, and the water reducing admixture shall be Type ‘A’. This admixture shall be of a non-air entraining type.

Special Requirements:

The Contractor’s attention is directed to the following special requirements.

Shop drawings and/or catalog cuts of pipe materials, connections, manholes, castings, fittings, manhole steps, and gaskets shall be submitted for review/approval. If further information is required, the Contractor shall furnish it immediately.

As-built drawings shall be the Contractor’s responsibility. During the progress of work, maintain an accurate record of the location of the piping with reference to job base lines grades and elevations. Show all changes made in the piping installation from the layout and materials shown on the approved shop drawings.

All construction must be performed in compliance with the Occupational Safety and Health Act of 1970, any subsequent amendments and all rules and regulations thereto appurtenant.

The locations of the existing underground structures as indicated on the drawings are approximate only and are based on the best information available at this time. The Contractor shall uncover and support existing underground utilities/structures as necessary at his own expense as part of the Contract. Any damage to existing utilities/structures resulting from the Contractor's activities shall be repaired at the Contractor's expense. Any and all emergency repairs to existing utilities/structures that have been damaged by the Contractor's activities shall be the responsibility of the Contractor. The Engineer will notify the Contractor by telecommunication and the Contractor shall be required to commence the repair immediately. In the event the Engineer is unable to contact the Contractor for immediate emergency repair work in the length of time as determined by the Engineer, the Engineer reserves the right to attend to any and/or all emergency repair work and to submit the costs of repair directly to the Contractor for complete payment.

The Contractor shall guarantee that all work and/or workmanship performed under this Contract shall be in strict accordance with the Contract Documents. This guarantee shall be for a period of two years from and after the date of completion and acceptance of the work. The Contractor shall repair, correct or replace as required, promptly and without charge, all work, equipment and material, or parts thereof, which fail to meet the above guarantee or which in any way fail to comply with or fail to be in strict accordance with the terms and provisions and requirements of the Contract during such two-year period.

All changes to the design of the gravity sewers during construction shall receive approval by Sussex County Sewer prior to installation.

All pipes, fittings, plugs and other components shall be carefully examined and inspected for defects and any found imperfect will not be utilized for the work. If at any time before the final acceptance of the Contract, any defects are found in the sewer mains or its appurtenances the Contractor shall remove and replace the defective area. The Contractor, for any section of the sewer that fails any field test, shall take steps to eliminate the cause of failure. The correction of defects shall be done without extra compensation for the labor and material required even though such damage or failure may not have been due to any act, default or negligence on the part of the Contractor.

The Contractor shall be required at his own expense to prevent dust nuisance.

Construction Methods:

All work in connection with construction of gravity sewers shall conform to the applicable requirements of Sussex County Ordinance 38 except as modified by the Plans and these Special Provisions. In case of conflict, the Specifications of Sussex County Ordinance 38 shall prevail.

Excavation and Trenching - Excavation shall be performed in accordance with Section 208 – Excavation and Backfill for Pipe Trenches except as amended herein. Trenches shall be excavated to the necessary width and depth as directed. Trenches under paving and trenches at all points below the top of the pipe to be laid therein shall be in accordance with the standard detail drawings. Where sheeting is used, the maximum width below the top of the pipe, as prescribed above, shall be measured between the interior faces of the sheeting as driven, but in no case shall stringers or waling-strips be so placed as to interfere with the proper ramming of the earth under and around the pipe. In case the sheeting does not extend below a point 6-inches above the pipe as laid, the maximum width allowed shall be measured between the faces of the excavation below the bottom of the sheeting.

Trenching on hard surface roads will be permitted only when the hard surface has first been cut for its full depth along the trench lines, by sawcutting.

Materials removed which are to be replaced after the installation of the pipe line or structure, shall be stored in a suitable place and manner until such time as the materials are reused. The Contractor shall replace at his own expense any such materials lost or damaged beyond use by careless or neglectful removal or storage. Sod and topsoil over areas to be excavated or filled my, at the Contractor's option, be stripped and stored for reuse, as approved by the Engineer.

No greater length of the trench at any location shall be left open in advance of the completed structure placed therein than shall be authorized or directed. The Engineer shall be empowered to require the refilling of open trenches over completed pipe lines if, in his judgment, such action is necessary. The Contractor shall have no claim for extra compensation even though to accomplish said refilling he/she compelled temporarily to stop excavation or other work at any place.

If work is stopped on any trench for any reason except by order of the Engineer and the excavation is left open for an unreasonable length of time in advance of construction, the Contractor shall if so directed, refill such trench at his own cost and shall not again open said trench until he is ready to complete the structure therein. If the Contractor shall refuse or fail to refill such trench completely within forty-eight (48) hours after said notice the Engineer shall be authorized to do the work and the Engineer shall charge the expense thereof to the Contractor and retain the same out of any monies due to him/her under the Contract.

The excavation of all trenches shall be fully completed at least twenty (20) feet in advance of pipe laying, unless otherwise authorized or directed by the Engineer.

The Contractor, at his/her own expense, shall keep all excavation free from water below the subgrade of the work while the work is in progress and to such extent as may be necessary while excavation work alone is being carried on. The Contractor shall build all dams, under drains and other devices necessary for this purpose and provide and operate pumps of sufficient capacity for dewatering the excavations. The Contractor shall provide for the disposal of the water removed from excavations, in such manner as shall not cause injury to the public health, to public or private property, or to any portion of the work completed or in progress, or any impediment to the use of the streets by the public. The cost of dewatering is to be included in the Contract. The method used to accomplish this dewatering must meet with the Engineer's approval.

Any material encountered during the excavation of any trench which will not consolidate over a reasonable period of time after being replaced in the trench shall be removed from the project site and replaced with material approved by the Engineer. Excavating below subgrade and supplying and placing of imported Select fill material shall be included in the Contract Lump Sum Bid Price for Sanitary Sewer System.

In backfilling trenches in which pipe is laid the earth shall be carefully placed by hand in 6-inch layers and solidly compacted under, around and over the pipe for a depth of at least one (1) foot above the top of the pipe. Such compacting shall be done in a thorough manner with hand rammers made for the purpose and the greatest care shall be exercised so as not to disturb freshly made joints or the alignment of the pipe. The backfill shall be carried up and tamped evenly on both sides of the pipe. After the backfill material has reached the abovementioned height and has been tamped as specified the remainder of the trench may be filled by hand or by machinery at the option of the Contractor. Proper care shall be taken at all times not to injure the pipe line by jarring or by the impact of improperly placed fill material.

All refill material above the level of one foot over the top of the pipe shall be tamped in 8 inch layers to the density of the adjacent undisturbed soil unless otherwise shown, specified or directed. Compaction shall be carried out to achieve a density of at least 95% of the maximum density as determined by AASHTO Method T-191. If a test shows that the actual density in any area is less than the required density the Contractor shall recompact the area represented by the unsatisfactory test result. Recompacted areas shall be subject to retesting at the option of the Engineer. Mechanical tampers shall be capable of exerting a blow equal to two hundred fifty (250) foot pounds per square foot of area of tamping face. Puddling will be allowed only with the written permission of the Engineer.

After completion of refilling all material not used therein, including such earth that cannot be properly rounded up over the refilled excavation, shall be removed and disposed of in such a manner and at such point or points as shall be approved or directed and all roads, sidewalks, and other places on the line of work shall be left free, clean and in good order. Said cleaning up shall be done by the Contractor without extra compensation and if he/she shall fail to do such work within reasonable time after receipt of notice it will be performed by the Engineer and the cost shall be retained out of the monies due or to become due to the Contractor under the Contract.

In the event that more material is needed to fill areas as shown on the plans the Contractor shall obtain borrow material from other sources. The obtaining of such borrow excavation shall be the Contractor's responsibility. All borrow excavation shall be of satisfactory quality for the purpose for which it is required.

All fills shall be placed in layers not thicker than eight inches and each layer shall be thoroughly compacted by rolling, tamping, or otherwise as directed by the Engineer. Where directed, water shall be used as required to bring the earth into proper condition for maximum compaction.

Mechanical tampers shall be capable of exerting a blow equal to two hundred-fifty (250) foot pounds per square foot of area of tampering face. One mechanical tamper shall be used for every two hand shovelers.

The excavation, backfill and backfilling shall be included in the price of the gravity sewer.

General Installation of Gravity Sewer Pipe and Fittings – Each length of pipe shall be carefully inspected by the Contractor for possible defects before laying. The Pipes shall be thoroughly cleaned before they are laid and shall be kept clean until the acceptance of the completed work. The upper ends of all pipe lines shall be provided with a carefully fitted stopper, which shall be used at all times, to prevent the entrance of dirt and other substances.

Pipe shall be carefully handled or lowered into the trench and laid true to the line and grade. Bell holes shall be dug sufficiently large to insure the making of proper joints and to provide a firm, solid bearing for the entire length of the pipe.

Special care shall be taken to insure that each length shall abut against the next in such a manner that there shall be no shoulder or unevenness of any kind along the inside of the bottom half of the pipes as laid.

Before joints are made, each pipe shall be well bedded on a solid foundation and no pipe shall be brought into position until the preceding length has been thoroughly embedded and secure in place. After pipes have been laid, there shall be no walking on or working over them, except such as may be necessary in tamping, until there is a covering at least two (2) feet in depth over their top. After joints have been made, the greatest care shall be used not to disturb or damage them during the refilling process, or at any other time. The Contractor's attention is directed to compaction requirements for haunch support of PVE pipe.

Proper and suitable tools and appliance for the safe and convenient handling and laying of pipes and fittings shall be used. Great care shall be taken to prevent the pipe lining and coating from being damaged, and any lining or coating damaged in any way shall be repaired to the satisfaction of the Engineer by the Contractor at his/her own expense.

The excavations in which pipe is being laid shall be kept free from water. No water shall be allowed to rise over or run through the pipe while any joint is being made, nor until after it has thoroughly set. Any defects due to settlement shall be made good by the Contractor at his/her own expense.

Whenever a pipe requires cutting to fit into the line or to bring it to the required location, the work shall be done in a satisfactory manner so as to leave a smooth end, and without extras compensation.

No pipe shall be laid upon a foundation into which frost has penetrated, nor at any time when the Engineer shall deem that there is danger in the formation of ice or the penetration of frost at the bottom of the excavation unless all precautions as to the minimum length of open trench and promptness of refilling are observed.

If, at any time before the final acceptance of the contract, any broken pipes, or any defects are found in the gravity sewers or in any appurtenances, the Contractor shall cause the same to be removed and replaced by proper material and workmanship, without extra compensation for the labor and material required, even though such injury or damage may not have been due to any act, default or negligence on the part of the Contractor. All materials shall be carefully examined by the Contractor for defects, just before placing, and any found defective shall not be placed in the line.

Installation of PVC Gravity Sewer Pipe and Fittings for PVC pipe shall be installed in accordance with ASTM D-2321 "Standard Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe" and TR-614A Ring Tite PVC sewer pipe installation guide.

Allowable pipe deflection for PVC pipe provided under this specification shall be installed so that deflection of no more than 3% may be anticipated. Deflection shall be computed by dividing the amount of deflection (nominal diameter less minimum diameter measured) by the nominal diameter of the pipe. Average deflection between two adjacent manholes shall not exceed 4% and no deflection at any point shall exceed 5% as per the pipe manufacturer's recommendation utilizing the go/no go gauge method.

If, after initial inspection, in the opinion of the Engineer the deflection appears excessive, the Engineer may order the Contractor to arrange for and take accurate measurements of the pipe at whatever intervals and at whatever locations between adjacent manholes deemed advisable. All cost involved in taking measurements ordered by the Engineer following initial inspection shall be borne by the Contractor, if the deflection in the pipe exceeds either of the maximum limits specified herein.

Measurements may be taken or ordered by the Engineer at any time during the maintenance period. Measurements shall be performed in a manner and method approved by the Engineer.

Branches and Standpipes – The Contractor shall place Wye fittings and/or saddles at such points along the sewers and in such positions, as shown on the drawings and as directed in the field. The branch itself shall be set at such vertical angle as shall be necessary to bring the bulding/campsite connections at the proper depth. In general, this angle shall be from 30 to 45 degrees, measured from the horizontal. The length of the Wye branches shall be not less than two (2) feet, nor more than three (3) feet, as may be necessary to bring branches to proper location.

Where the building/campsite connection would otherwise be too deep, the branch of the Wye shall be placed vertically, and if required, the building/campsite connection connecting therewith shall be built to such vertical height as may be directed, before leaving the sewer trench. The change of direction at the upper end of standpipe shall be made by a single or double wye branch, for the purpose of connecting respectively, one (1) way. Concrete, 2500 psi, as shown on the drawings, or as directed, shall be placed around the Wye branch designated.

Gravity Sewer Testing – The Contractor shall perform a low-pressure air test of the installed sewer pipe in accordance with UNI-BELL recommendations. The prescribed pressure drop should not exceed 0.5 psi for a minimum test duration of four (4) minutes.

Before they are tested, all sewers shall be carefully plugged and backfilled to a depth of not less than two (2) feet above the top of the sewer.

The Contractor shall replace or repair all visible leaks and defects on all sections of sewer failing to meet the test requirements.

The cost of all tests and all assistance in connection with the tests above, shall be borne by the Contractor.

If inspection of gravity sewer testing indicates pipe leakage, the Contractor shall identify and repair the defect at no additional expense to DNREC and inspection and/or testing shall be repeated. All repairs shall be made with new material. Failure to meet the tests specified above will be sufficient cause to reject the work until the defects are satisfactorily repaired. All expenses and costs incurred for inspection and testing/retesting shall be borne by the Contractor at no extra cost to the State and shall be included in the Contract lump bid price for the item Sanitary Service System.

Method of Measurement:

The quantity of installing Gravity Sewer service piping and/or RV connections will not be measured.

Basis of Payment:

The quantity of Sanitary Service System will be paid for at the Contract lump sum. Price and payment will constitute fill compensation for furnishing and installing all gravity sewer pipe and fittings, sewer connections, concrete encasements, sewer manholes, sewer cleanouts, pavement removal and replacement, excavation, backfill, compaction, dewatering, completing all connections to existing sewer as shown in the Contract Drawings, furnishing all necessary borrow material, proper disposal of all excess material and construction debris and furnishing and installing all services, equipment, materials and labor necessary for the complete and proper installation of the gravity sewer as indicated in the Contract Documents.

6/28/13

763501 - CONSTRUCTION ENGINEERING

Description:

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

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

The Engineer will only establish the following:

a. Original and final cross-sections for borrow pits
b. Final cross-sections for all excavation items
c. Line and grade for extra work added on to the project plans

Equipment:

The Contractor shall use adequate equipment/instruments in a good working order. He/she shall provide written certification that the equipment/instrument has been calibrated and is within manufacturer's tolerance. The certification shall be dated a maximum of 9 months before the start of construction. The Contractor shall renew the certification a minimum of every 9 months. The equipment/instrument shall have a minimum measuring accuracy of [3mm+2ppmxD] and an angle accuracy of up to 2.0 arc seconds or 0.6 milligons. If the Contractor chooses to use GPS technology in construction stakeout, the Contractor shall provide the Engineer with a GPS rover for the duration of the contract. The GPS rover shall be in good working condition and of similar make and model used by the Contractor. The Contractor shall provide up to 8 hours of formal training on the Contractor's GPS system to a maximum of four Engineer's appointees. At the end of the contract, the Engineer will return the GPS rover to the Contractor. If any of the equipment/instruments are found to be out of adjustment or inadequate to perform its function, such instrument or equipment shall be immediately replaced by the Contractor to the satisfaction of the Engineer.

Engineering/Survey Staff:

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

Construction Methods:

Performance Requirements:

a. Construction Engineering shall include establishing the survey points and survey centerlines; finding, referencing, offsetting the project control points; running a horizontal and vertical circuit to check the accuracy of given control points. Establishing plan coordinates and elevations marks for culverts, slopes, subbase, subsurface drains, paving, subgrade, retaining walls, and any other stakes required for control lines and grades; and setting vertical control elevations, such as footings, caps, bridge seats and deck screed. The Contractor shall be responsible for the preservation of the

Department's project control points and benchmarks. The Contractor shall establish and preserve any temporary control points (traverse points or benchmarks) needed for construction. Any project control points (traverse points) or benchmarks conflicting with construction of the project shall be relocated by the Contractor. The Contractor as directed by the Engineer must replace any or all stakes that are destroyed at any time during the life of the contract. The Contractor shall re-establish centerline points and stationing prior to final cross-sections by the Engineer. The Vertical Control error of closure shall not exceed 0.05 ft times [Square root of number of miles in the level run] (0.01 m times [square root of number of kilometers]). The Horizontal Control accuracy ratio shall not exceed an error of closure of 1 foot per 20,000 feet (1 meter per 20,000 meters or 1:20,000) of distance traversed prior to adjustment.

b. The Contractor shall perform construction centerline layout of all roadways, ramps and connections, etc. from project control points set by the Engineer. The Contractor using the profiles and typical sections provided in the plans shall calculate proposed grades at the edge of pavement or verify information shown on Grades and Geometric sheets.

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

d. The Contractor shall establish the working points, centerlines of bearings on bridge abutments and on piers, mark the location of anchor bolts to be installed, check the elevation of bearing surfaces after they are ground and set anchor bolts at their exact elevation and alignment as per Contract Plans. Before completion of the fabrication of beams for bridge superstructures, the Contractor shall verify by accurate field measurements the locations both vertically and horizontally of all bearings and shall assume full responsibility for fabricated beams fitting and bearing as constructed. After beam erection and concurrently with the Department project surveyors, the Contractor shall survey top of beam elevations at a maximum of 10-ft (3.0-meter) stations and compute screed grades. These shall be submitted to the Engineer for review and approval before the stay in place forms are set. Construction stakes and other reference control marks shall be set at sufficiently frequent intervals to assure that all components of the structure are constructed in accordance with the lines and grades shown on the plans. The Contractor will be responsible for all structure alignment control, grade control and all necessary calculations to establish and set these controls.

e. The Contractor, using contract plans, shall investigate proposed construction for possible conflicts with existing and proposed utilities. The Contractor shall then report such conflicts to the Engineer for resolution. All stakes for advanced utility relocation, which will be performed by others, shall be paid for under item 763597 – Utility Construction Engineering.

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

g. If wetland areas are involved and specifically defined on the Plans the following shall apply:

1. It is the intent of these provisions to alert the Contractor, that he/she shall not damage or destroy wetland areas, which exist beyond the construction limits. These provisions will be strictly enforced and the Contractor shall advise his/her personnel and those of any Subcontractor of the importance of these provisions.

2. All clearing operations and delineation of wetlands areas shall be performed in accordance with these Special Provisions. Before any clearing operation commences the Contractor shall demarcate wetlands at the Limits of Construction throughout the entire project as shown on the Plans labeled as Limits of Construction or Wetland Delineation to the satisfaction of the Engineer.

3. The material to be used for flagging the limits of construction shall be orange vinyl material with the wording "Wetland Boundary" printed thereon. In wooded areas, the flagging shall be tied on the trees, at approximate 20-foot (6.1 meter) intervals through wetland areas. In open field and yard areas that have been identified as wetlands, 3 foot (one meter) wooden grade stakes shall be driven into the ground at approximate 20 foot (6.1 meter) intervals and tied with the flagging.

4. If the flagging has been destroyed and the Engineer determines that its use is still required, the Contractor shall reflag the area at no cost to the Department. If the Contractor, after notification by the Engineer that replacement flagging is needed, does not replace the destroyed flagging within 48 hours, the Engineer may proceed to have the area reflagged. The cost of the reflagging by the Engineer will be charged to the Contractor and deducted from any monies due under the Contract.

5. At the completion of construction, the Contractor shall remove all stakes and flagging.

6. The Contractor shall be responsible for any damages to wetlands located beyond the construction limits, which occurs from his/her operations during the life of the Contract. The Contractor shall restore all temporarily disturbed wetland areas to their preconstruction conditions. This includes restoring bank elevations, streambed and wetland surface contours and wetlands vegetation disturbed or destroyed. The expense for this restoration shall be borne solely by the Contractor.

Submittals:

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

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

a. Proposed method of recording information in field books to ensure clarity and adequacy.
b. 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.
e. Description of newly established benchmarks with location, elevation and closed loop survey field notes.
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 borrow 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.

Method of Measurement:

The quantity of Construction Engineering will not be measured.

Basis of Payment:

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

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

2/18/13

763503 - TRAINEE

Description:

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

Basis of Payment:

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

2/18/13

763508 - PROJECT CONTROL SYSTEM DEVELOPMENT PLAN
763509 - CPM SCHEDULE UPDATES AND/OR REVISED UPDATES

Description:

The Project Control System will be set up and maintained by the Department of Transportation to monitor and record work in progress and to coordinate and synchronize construction management functions. The Department will use Critical Path Method (CPM) scheduling to approve the Contractor's work schedule, review work progress, evaluate time extensions, identify problem areas, and recommend solutions to maintain the established work schedule. The Department will designate a Critical Path Method Administrator (CPMA) to oversee the Project Control System.

The Contractor shall designate a Critical Path Method Coordinator (CPMC) having proven experience in construction scheduling and in CPM concepts and scheduling. The CPMC shall be familiar with and have direct contact with both the Contractor's front office and field staff. The CPMC shall be knowledgeable of the status of all parts of the work throughout the length of the Contract in order to properly coordinate the Contractor's work schedule information and shall be available for consultation and preparation of documents on a daily basis. If this condition is not complied with the Contractor shall submit qualifications for a replacement CPMC to the CPMA for approval by the Engineer.

The CPMC shall submit a working drawing schedule, materials schedule, crew schedule; and shall prepare and provide the "look ahead", original, update, revised update, and final (as-built) update CPM work schedules, written CPM schedule narratives, and other CPM schedule information as required by the Project Control System Development Plan. The CPMC shall prepare and provide the Contractor's work schedule information by email as a single compressed database file in CPM format fully compatible with the WindowsÒ version of Primavera Project PlannerÒ used by the Engineer for generation of the CPM schedules.

The CPM format shall be the Precedence Diagram Method with days as the Planning Unit and shall be based on Calendar Days. Schedules will be developed using every day as a workday; schedules with calendars based in any manner on Working Days will not be allowed. The CPMA will receive the Contractor's CPM schedule databases for input to generate the CPM schedules. The generated CPM schedules are the Contractor's own work schedule and will be reviewed for approval by the Engineer. CPM schedules approved by the Engineer will have the word “schedule” in the center title block (layout name) of their graphic outputs and title line of their report outputs.

The scheduling of the construction is the responsibility of the Contractor; the Contractor is responsible to determine, by adequate planning, the most feasible order of work commensurate with the Contractor’s abilities and the Contract Documents.

The Contractor's compliance with the Project Control System Development Plan and CPM Schedule Updates and/or Revised Updates, and the Engineer's approval of the generated original CPM schedule, its updates and/or revised updates will be required before processing monthly estimates for payment.

It is not the intent of this Contract that the Engineer by approving the CPM schedules agrees that it is reasonable in all respects or that the schedule, if followed, will result in timely completion of the Project. The Engineer's approval is based on a review of general conformity for compliance with the requirements of the Project Control System and on the items or time restrictions that the department and/or the Engineer have control. The Contractor is free to make assumptions regarding field conditions, estimated quantities, and/or subsurface conditions. However the Department's concurrence with the Contractor's schedule based on these assumptions does not relieve the Contractor from making necessary revisions to his schedule should his assumptions fail to hold true. No time extension to the Contract which is due to assumptions made by the Contractor and that do not hold true during construction will be considered by the Department. Discrepancies and/or changes initiated by the Department in proposed quantities or plans that cause an extension to the critical path will be considered by the CPMA. The Department's controls or time restrictions are identified hereinafter and in the Standard Specifications, Special Provisions, and on the Contract Plans as plan notes.

Development of the Project Control System (PCS):

a. The PCS development plan is as follows:

Within seven (7) calendar days after the date of the fully executed Contract a workshop meeting will be held with the Engineer, CPMA, Contractor, and CPMC. The CPMA will profile the basics and procedures of the Project Control System and discuss schedule model design at this meeting. Attendance is mandatory,

The Department's partially predetermined Coding Structure (CS) format having a maximum of seventeen (17) code classification levels will be used and will be furnished at the Workshop Meeting. The CS is a specific listing that illustrates the hierarchy of work needed for the project. The hierarchy is categorized into levels or classifications. The CS classifications organize activities into manageable groups through each level of the project, for example; locations, phasing (staging), landmark dates, roadway sections and bridge structures; footings, columns, and caps; contractor and subcontractor.

The CPMC shall assist in determining the breakdown and code title descriptions from south to north and west to east of the location code classification. Activity code values shall be perspicuous for each classification grouping. Additional activity code classifications and values as required by the Engineer from time to time shall be provided and added to the schedule database by the CPMC. The CPMC shall not alter the CS and properly code all activities with the approved CS activity code values for all code classifications including all railroad, waterway, and outside agency activities with approved code values, including classifications as added by the Engineer. Coding enables generation of organized reports and graphics that can summarize any level of the project schedule.

When the Department provides a format database for the Contract, it shall be used by the Contractor as the basis from which to develop their schedule. The CPMC may add, but not insert, code classifications in the format database;

b. Within fourteen (14) calendar days after the workshop meeting, the CPMC:

1. Shall submit a working drawing schedule, using the Department's application format or other format as agreed to by the Engineer. This schedule shall also include all other items having content that requires approval to allow any portion of the work to commence or continue. This schedule shall be submitted to the CPMA for approval by the Engineer and shall contain all required working drawings and also include but not be limited to reinforcing bar lists, formwork drawings and calculations, construction procedures, borrow pit security and traffic plans, precast structures, wetland work plans, construction sequencing, load tests, and wave equation analyses. Working drawing information shall include the identification number, description, type, anticipated submittal date, time frame for preparation and review, approval needed by date, and a resubmittal process (if expected) for each listed item. This information shall also give factory leadtime and expected delivery date, if applicable, for each listed item.

   The Contractor should be aware that the Department's time frame for review of working drawings and other submittals properly submitted or resubmitted in accordance with Standard Specification Subsection 105.04 will be thirty (30) calendar days duration unless mutually agreed to by the CPMC and CPMA; this 30 day duration supercedes the time frame of the Subsection. If a working drawing or other submittal involves review by railroads, environmental agencies, municipalities, other states, federal agencies, or the U. S. Coast Guard the time frame for review will be sixty (60) calendar days unless mutually agreed to by the CPMC and CPMA. The time frame will begin on the date of receipt of the drawings by the reviewer and will end on the date of transmittal returning the drawings to the Contractor by the Department. No drawings will be accepted for review until an initial working drawing schedule has been accepted unless agreed to by the Engineer.

   The working drawing schedule shall be updated and correlated with the activities of the "look ahead" and all other CPM schedules;

2. Shall submit a materials schedule using the Department's application format or other format as agreed to by the Engineer. This schedule shall be submitted to the CPMA for approval by the Engineer and shall contain all required materials, samples, and sources of supply.

The materials schedule information shall include the identification number, description, generic or brand name, sample requirement, and manufacturer's and supplier's name, address, and phone number for each listed item. The schedule shall also give the anticipated submittal date, time frame for preparation and review, approval needed by date, factory leadtime, and expected delivery date, if applicable, for each listed item.

The materials schedule shall be updated and for materials having long factory leadtimes shall be correlated with the activities of the "look ahead" and all other CPM schedules;

3. Shall submit a crew schedule. This schedule shall be submitted to the CPMA for approval by the Engineer and shall be accompanied by a written narrative and shall contain all crews and their work plan.

   The crew schedule shall be updated and correlated with the activities of the "look ahead" and all other CPM schedules;

4. Shall prepare and provide a written narrative of the Contractor's work plan and an acceptable "look ahead" schedule database in CPM format. This schedule database shall reflect activities for the Contractor's overall work plan for the entire project detailing the "look ahead" period and shall be submitted to the CPMA for acceptance by the Engineer. The "look ahead" period shall be as determined by the Engineer. The "look ahead" schedule shall be maintained and updated until an Original CPM schedule is approved. The "look ahead" schedule shall also reflect the Sequence of Construction in the plans unless otherwise approved by the Engineer. This "look ahead" schedule, its updates and/or revised updates shall also be incorporated into the Original CPM schedule database. Issue of the Notice to Proceed is contingent upon receipt and acceptance of this schedule in accordance with Standard Specification Subsections 108.02 and 108.03; and

5. Shall begin meeting with the CPMA at their office every third business day to prepare and provide a written narrative of the Contractor's work plan and a CPM schedule database until a useable, logical draft of the full CPM schedule network, responsive to the project requirements and correlated with the required schedules has been developed as determined by the Engineer. The CPMA will generate an initial CPM schedule from the CPMC's logical draft CPM schedule database for review by the Engineer. This initial schedule shall reflect the Sequence of Construction in the plans unless otherwise approved by the Engineer. This initial CPM schedule database, if acceptable, may be used to fulfill the Contractor's "look ahead" schedule requirements;

c. If the initial CPM schedule is not acceptable to the Engineer, the CPMC shall continue to meet with the CPMA on every third business day and prepare and provide the Contractor's written narrative and CPM schedule database as necessary until a generated CPM schedule is acceptable to the Engineer; and

d. Within twenty-eight (28) calendar days after the workshop meeting, an initial CPM schedule must be generated having the requirements for the Engineer's approval. This schedule shall reflect a clear understanding of the Contractor's work plan, be adequate to determine the Department's staffing requirements, have correct physical logic, incorporate construction and traffic phases, and display clarity of presentation for review and processing. Upon approval the CPMA will furnish the Contractor a graphic and report output of this CPM schedule. This CPM schedule, or Original CPM schedule, is the Contractor's own work schedule and the Contractor's responsibility to maintain.

The ending (cut-off) day for each monthly estimate period shall be proposed by the Contractor subject to Department approval. In the event of a conflict, the Engineer will have the authority to establish the ending day.

Processing of monthly estimates for payment will begin or continue only if the Contractor is in compliance as determined by the Engineer with the PCS Development Plan.

Any information required by the Engineer for analysis of the CPM schedules, their updates and/or revised updates; clarification of charts and other schedules; and evaluation of proposed changes or change orders

shall be prepared and provided by the CPMC. A copy of the current approved CPM schedule, its updates and/or revised updates shall be on display at the field office of both the Department and the Contractor.

CPM schedule information and requirements:

The CPMC shall prepare and provide the Contractor's work schedule information in the form of work step and restraint activities:

a. Work step activities are single step construction elements,
b. Restraint activities are not construction elements but affect the start of other activities.

When setting forth work steps and restraints the breakdown on these activities shall address the following factors:

Work Step factors affecting the duration and/or sequence of activities;

a. Work at locations done at different times or requiring different crews,
b. Work requiring different materials,
c. Work requiring different crew or craft requirements,
d. Work requiring different equipment,
e. Work requiring different responsibility (subcontractors),
f. Structural work having distinct subdivisions,
g. Labor and equipment resource availability,
h. Work as reflected in the Contractor's estimating or accounting breakdown,
i. Work as reflected in the state's breakdown for bidding or payment,
j. Public, private, and/or Contractor utility work and limiting or outage schedules of public and/or private utility organizations, and
k. Maintenance of traffic.

Restraint factors affecting the start of other activities;

a. Preparation of working drawing and materials submittals,
b. Approval, return, and/or resubmittal of working drawings and materials,
c. Specialized material testing,
d. Long lead purchases - material and equipment availability,
e. Material and equipment fabrication time,
f. Testing of special equipment and in place testing,
g. Delivery of unusual shipment or scarce material,
h. Dependency on completion of utility work,
i. Dependency on the Department's approval of issues involving public, private, and/or other governmental agencies,
j. Dependency on completion of part or all of another Department contract or construction of other organizations, whether contiguous or not,
k. Protection and restoration of property, forest protection, special traffic controls, erosion control and water pollution, environmental controls and suspensions, safety, and foreseeable archeological and/or historical evidence delays,
l. Procurement of permits, and
m. Conditions as set forth in Standard Specification Subsection 107.01.

Activities must be identified by a name, symbol, and coding, and shall have duration, sequence, responsibility, and resources.

Activity names or titles shall be descriptive and be single identifiable work steps or restraints. A sample breakdown list of activity titles may be furnished to the Contractor by the Engineer on request. Activities shall be selected, as a minimum, on a structure by structure and/or section by section basis where relevant and have further breakdown into secondary components. Activities shall be inclusive and representative of the Contract work. Activity symbols, or ID's, shall be unique and systematic.

Activity codes shall have classifications and values. The approved CS will determine activity code classifications and values. The CPMC shall identify activities using these classifications and code values. Additional activity codes as required by the Engineer shall be provided by the CPMC.

Activity durations, or Original Durations, shall be reasonable and representative of the scope of the activity. If durations are considered excessive or insufficient, the industry standard will be used. Original Durations may not exceed thirty (30) calendar days unless approved by the Engineer. Durations of activities shall be determined by using productivity rates based on calendar days, not work days. Original Durations of activities may not be less than two (2) calendar days unless agreed to by the CPMA. The use of calendar day productivity rates in CPM scheduling allows for customary days during the work week that the Contractor does not work and for normal weather delays. Productivity rates used to establish durations shall reflect the time periods when work can be scheduled and exclude the non-work period of the activity's calendar. Activity calendars allow activities to be scheduled only when allowed by the nature of or restraints on the work. Calendars shall not exclude weekends, holidays, or other times the Contractor does not work.

All activities shall be identified by entry of their appropriate Calendar. A minimum of fourteen (14) shall be used and the first fourteen (14) shall be ordered and entitled as follows: 1) Full schedule, 2) Environmental, 3) Winter Condition, 4) Concrete Work, 5) Concrete Work Winter, 6) Concrete Deck, 7) Concrete Paving, 8) GABC, 9) Asphalt Base, and 10) Asphalt Surface, 11) SMA, 12) Night Paving Asphalt Base, 13) Night Paving Asphalt Surface, 14) Night Paving SMA. Calendar non-work periods shall reflect the average Delaware weather history of and the environmental regulations for the location of the Contract work. The Contractor may perform work during its calendar non-work period when favorable weather allows the work to be performed without compromising its specification and at no cost to the Department. When the Department provides a format database from which to develop the CPM schedule, the Contractor shall not modify the Calendars in the format database unless approved by the Engineer. The non-work periods of the calendars follow:

CALENDAR	NON-WORK PERIOD
1) Full schedule,	N/A
2) Environmental:	Varies; project specific,
3) Winter Condition:	December 1 thru March 15,
4) Concrete Work:	December 1 thru March 15,
5) Concrete Work Winter:	N/A (Protection provided at no cost to the Department)
6) Concrete Deck:	November 15 thru March 31,
7) Concrete Paving:	December 1 thru March 15,
8) GABC:	November 15 thru March 15,
9) Asphalt Base:	November 15 thru March 15,
10) Asphalt Surface:	November 15 thru March 15,
11) SMA	November 15 thru March 31,
12) Night Paving Asphalt Base:	October 15 thru April 30,
13) Night Paving Asphalt Surface:	October 15 thru April 30, and
14) Night Paving SMA:	October 15 thru April 30.

Activity durations are based on Calendar Days and shall reflect all time necessary to complete an activities work and its requisites. The Contractor shall include in their original schedule narrative their work day to calendar day conversion factors with a discussion of how these factors were determined. When scheduling using multiple resources each resource unit shall have a corresponding activity. All time to complete the activity shall include as a minimum all Contractor unscheduled work days, all Contractor holidays, and allowance for normal weather delays, except for software generated calendars. Inclement weather and failure of a contractor and their subcontractors to provide sufficient resources are not means to recover costs or time due to delay.

Activity sequence shall be typical of proficient scheduling practice. The sequence must be logical and representative of the Contractor's order of the work. Successors and predecessors determine the job logic or activity sequence. Successors are activities that follow an activity. Predecessors are activities that precede an activity. A given activity cannot start until all predecessors have been completed. The Precedence Diagram Method (PDM) shall be used. The PDM places the activities on nodes and the dependencies between them are defined by arrows. Only finish to start dependency relationships (links) shall be used; lag times may not be used unless approved by the CPMA. The Department reserves the right to request a resequencing of activities to effect competent scheduling practice and realistic job logic.

Activities shall be sequenced to reflect resource apportionment. When one crew (resource) is being utilized to perform all of many similar activities, these activities must be linked together in some sequence to reflect that one crew is performing the work. Additionally, when several crews are performing similar activities,

these activities must have separate linked sequences equal to the number of crews performing the work. Activities shall be logically connected and coded to reflect the crew (resource) performing the operation. A summary list of crews, their crew codes, and their operation(s) shall be included with each schedule submission unless unchanged. Resource loading will not be required unless otherwise directed by the Engineer. If resource loading is directed, payment will be incidental to the Item "763509 – CPM Schedule Updates and/or Revised Updates".

Activity responsibility shall be identified for each activity except those performed by the Contractor, if requested by the Engineer. Subcontractors, DBE's, utilities, performers of other contracts, and performers of adjoining work on other advertised contracts shall be identified by coding when responsibility for an activity is requested.

Activity resource loading shall be required only if the Contractor demonstrates the inability to maintain the CPM schedule. In this event, the Engineer shall have the authority to require resource information for all activities affecting project completion. Resource information includes manpower, equipment, materials, and/or services and has cost and has a range and amount of availability. Lack of sufficient resources will not be considered cause to extend durations when preparing the CPM schedule. By bidding to contract the work, the Contractor has ensured that sufficient resources are available or will be available in a suitable time frame to perform the work within the Contract Time, even if a resequencing of activities requires an activity or activities to shorten their Remaining Duration. In the event the Contractor demonstrates the inability to maintain the CPM schedule, the Engineer may require the Contractor to increase the number of shifts, begin overtime operations, work extra days including weekends and holidays, supplement construction plant and equipment, or all or any of the foregoing as a step to improve the Contractor's work progress all without additional cost to the Department.

Work activities shall as a minimum be representative of all construction work for each operation, each phase (stage), and each location.

Working drawings shall be included as activities. Preparation and leadtime (order, manufacture, and delivery time), shall be included as activities for each applicable working drawing item. A separate activity shall be used to begin the submittals of working drawings. Time extension(s) will not be considered when submittal activity(s) affects the critical path except for owner caused delay as recognized by the Engineer. If working drawings require resubmittal(s), activities for their preparation and activities for their approval (having the Department's review time) shall be included in the next CPM schedule update database. Time extension will not be considered when resubmittal activity(s) affects the critical path except for owner caused delay as recognized by the Engineer. Working drawing activities and leadtime activities not requiring submittal shall not be on the critical path of the Original CPM schedule.

Materials having long leadtime and/or manufacture time or that are difficult to acquire and/or fabricate shall have materials approval and leadtime activities included in the schedule for each applicable material item. A separate activity shall be used to begin the submittal of these materials. These material approval and leadtime activities shall not be on the critical path of the Original CPM schedule.

Administrative milestones shall be included as activities. Each milestone of the bidding through first chargeable day process shall be an activity.

Utility work shall be included as activities and shall be identified accordingly. Each utility item on the plans or listed in the Contract's Utility Statement shall be an activity. The activity description shall indicate the utility company and include the number of each listed item or be numbered according to the item's order in the Utility Statement. A separate activity shall be used to begin utility work. Utility activities shall not be impactive on the Original CPM schedule unless authorized by the Engineer.

Agency agreements and/or arrangements and other submittals for approval shall be included as activities. A separate activity shall be used to begin the agency items and other submittals for approval.

The effect of other Department contracts or construction of other organizations on the completion of part or all of this Contract shall be included as activities. A separate activity shall be used to begin these items.

Phasing (staging) shall be included as activities. These activities shall be correlated with the sequence or suggested sequence of construction on the plans and/or in the specifications. A separate start and finish milestone activity shall be used to start and to complete each phase.

When multiple crews are performing an operation or a string of operations, each crew shall be logical connected and coded to reflect the crew performing the operation.

Surcharge durations and special testing, if applicable, shall also be included as activities. Sufficient duration times for these activities will be allowed as per the plans and specifications or as agreed to by the Engineer.

Activity types must be either “task”, “start milestone”, or finish milestone. “Hammock” type activities may be allowed as agreed to by the Engineer. If the Department requires resource loading, “task” activities may be converted to “independent” type as agreed to by the Engineer.

Date constraints, float and duration constraints, and/or flags for activities will not be allowed. Milestones that do not constrain the schedule shall be allowed as agreed to by the Engineer when unique or unusual events cause a restraint to the Contractor's work schedule. The use of "Start No Earlier Than" (SNET) and “Zero Free Float” (ZFF) constraints for activities may be allowed for the purpose of schedule clarity or definitude if acceptable to the CPMA.

Total Float is defined as the difference between the current schedule finish date and the Contract Completion Date that is entered by constraint ("Project must finish by:" date) in the schedule.

Free float is defined as the amount of time between when an activity "can finish" (the early finish) and when an activity "must finish" (the late finish). Free float is float shared with all other activities and is defined as the amount of time an activity can be delayed without affecting the critical path of the schedule. It shall be understood by the Contractor and the Department that free float is a shared commodity, not for the exclusive use or financial benefit of either party. Either party has the full use of the free float until it is depleted.

The critical path is defined as the series of activities in a CPM schedule network that has the longest path in time. The submitted activity sequence and durations must generate a CPM schedule having only one (1) critical path; a schedule with multiple or near multiple critical paths will not be allowed. Work like project wide Maintenance of Traffic, Construction Engineering, or Temporary Erosion Control that by their nature are ongoing for long durations or the duration of the project and are basically complementary to other activities, shall be divided and condensed into "establish" and "conclude" activities to prevent this type of work from being the major portion of the critical path or its entirety.

The Project Start Date, or initial Data Date, of the Original CPM schedule shall be the first chargeable day of work. The first schedule activity related to productive work shall be entitled "First Chargeable Day" and shall be a start milestone. Nonproductive work and administrative activities may begin and/or end prior to the Project Start Date and shall be statused as such in the Original CPM Schedule. The submitted activity sequence and durations must generate an Original CPM schedule using all the Contract Time and a critical path having zero total float. An early completion schedule will not be allowed. The Contractor's original schedule shall reflect the use of the entire Contract Time. The schedule ending date that uses all the Contract Time in the Original CPM schedule will be the original Contract Completion Date. This Contract Completion Date shall be fixed (Project must finish by:) in the Original CPM schedule and shall remain unchanged unless a time extension is awarded.

The Contractor's Original CPM schedule shall allocate the work over the entire Contract Time. The Contractor shall not anticipate early completion in bid preparation and shall distribute all time-driven and/or time-dependent costs uniformly over every day of the Contract Time when preparing the bid. No early completion schedules will be accepted.

After the Original CPM schedule utilizing all the allocated Contract Time has been approved, job conditions or logic changes may occur which require revision to the schedule. Only an update may be revised. These revised updates must be reflective of the Contractor's actual intent in constructing the project. The revision may cause the project completion date to be earlier than the completion date of the current approved schedule. This is acceptable to the Department; but no claims will be considered for time-driven and/or time-dependent costs (such as delay and/or extended overhead expense) which are a result of not meeting this new project "early finish" date. Consideration for these costs would occur only for approved extensions that force actual project completion past the originally advertised Contract Time including authorized time extension(s). However, no credits for non-expended overhead will be requested should a Contractor successfully achieve completion of the project prior to the use of all the Contract Time.

If the project is delayed, the contractor must demonstrate the inability to perform other critical or near critical work to receive consideration for an extension of Contract Time.

CPM schedule databases shall be calculated using the relevant Data Date prior to submittal to the CPMA. The Data Date of CPM schedule updates and revised updates shall be the next day after the end of the update period. Schedule calculations of CPM databases shall be based on retained logic, contiguous durations, and total float as finish float.

Activity Log (memo) information is allowed, but must be factual; shall be removed, if redundant; and shall not be masked, but indicated for printing to output reports. Punctuation is not required for activity and Activity Log information unless necessary for clarity.

Statusing or contract progress of activities for updates is the entering of Actual Start dates, Suspend Date(s), Resume Date(s), Actual Finish dates, and changes in Remaining Durations to the database. An activity's Original Duration may not be changed. An activity that begins (has an Actual Start Date) must have its Remaining Duration reduced by at least 1 day.

Activity Suspend and/or Resume Dates shall be added to the activity record and the factual reasons for the cause shall be added to the respective activity Log. If an activity is suspended again it shall be curtailed and assigned an Actual Finish Date equal to the latest suspension date, and a new activity (portion 2) comprising the balance of remaining duration shall be created and inserted in succession; both activities shall indicate by log comment the facts causing this condition.

Log statusing shall be used when an activity has out-of-sequence progress and no Actual Finish Date. Out-of-sequence progress occurs when any previous predecessor of an activity has no Actual Finish date. Log statusing is the entering of the Actual Start date to the Activity Log of the database in the Departments format. These entries are not to be masked, but indicated for printing to output reports. Changes in Remaining Durations shall be entered to the database but not the Activity Log. When progress is no longer out-of-sequence or all previous predecessors of the activity have Actual Finish dates, the activity's Actual Start shall be taken out of log status and entered to the database. Log statusing provides schedule output that prevents graphic distortion of schedule activities and preserves the design sequence of the CPM schedule plan. The Engineer shall have the authority to require a revision of the CPM schedule because of out-of-sequence progress. A suspended activity that requires log statusing shall be treated in the same manner as though it was suspended again.

Each original, update, and revised update schedule database and subsequent draft submitted for approval shall have a unique and manifest Project Name and shall be uniquely identified by entry (Number/Version) in the schedule database.

Corrections are defined as entries to the database that rectify coding and activity identification errors. Corrections shall be identified by written narrative and/or as agreed to by the CPMA. Exception(s) taken in PCS or other Department correspondence shall be complied with in the subsequent update and/or a revised update of the CPM schedule.

Written narratives shall be included with each submission of initial or revised update databases. The narratives must conceptualize work plans, modifications, and/or corrections but may be summary unless otherwise directed by the Engineer. These narratives shall describe where and the crews and order of what is to be done; narratives that are a listing of the work will not be acceptable. The Department will only accept schedule databases that reflect the work plans, modifications, and/or corrections reflected by their respective written narratives.

Inaccurate and/or faulty databases of any CPM schedule update and/or revised update will be unacceptable and shall be summarily corrected and resubmitted. Resubmittals shall be labeled "2nd Draft", "3rd Draft", etc. as appropriate and identified by entry (Number/Version) in the schedule database.

Any activity(s) or activity information that is necessary to generate a CPM schedule acceptable to the Engineer and/or schedule information that is requested by the Engineer shall be prepared and provided by the CPMC.

The CPMA will generate the CPM schedule network reflecting the Contractor's scheduling information. Upon approval of the Original CPM schedule and subsequent CPM schedule updates and/or revised updates,

the CPMA will furnish the Contractor graphic and report outputs of these schedules. These CPM schedules are the Contractor's own work schedule and the Contractor's responsibility to maintain.

Monthly CPM Schedule Updates:

The CPMC shall meet with the Contractor and Resident Engineer and prepare the required work schedule progress information (status reports) to update the CPM schedule. This information shall be submitted on status forms provided by the Department that are generated from the Original Schedule and thereafter from the previous CPM schedule update or revised update(s). This update information shall reflect the current state of completed project work. The update information shall include all activities on which work was performed and/or there was progress during the update period and shall include as a minimum their actual start dates, suspend dates, and resume dates; and the estimated remaining durations or actual finish dates. The update information shall be as agreed to and signed-off and dated by the Resident Engineer and the CPMC. The CPMC shall use the signed-off and dated information to status and/or log status the update database.

The Contractor shall submit the CPM schedule database update and a copy of the signed off update information within five (5) calendar days after the end of each monthly update period. The database and signed off information must match. The CPMA will generate a CPM schedule update reflecting the Contractor's update information. The five (5) calendar day submittal period will enable the Department to discuss current schedule information at the monthly progress meeting held the following week.

If the critical path of the generated CPM schedule update has less than minus ten (-10) calendar days of total float the CPM schedule update shall be revised.

Upon approval of the CPM schedule update, the CPMA will furnish the Contractor a graphic and report output of this update. This CPM schedule update is the Contractor's own updated work schedule and the Contractor's responsibility to maintain.

CPM Schedule Revised Updates:

The CPM schedule shall be revised if the critical path has less than minus ten (-10) calendar days of total float, conditions require the Contractor to modify the work schedule, the Contractor chooses to make a significant change in the sequence of work, or the Department requests the schedule to reflect the current state of the work and/or the Contractor's acknowledged work plans. The revised update shall reflect the Contractor's current order of work and include new and/or previous activities affected by the change and shall include a written narrative of these changes. Revision as required by this Specification or as requested by the Department does not constitute acceleration unless agreed to by the Engineer. Revisions shall be identified as the revised update of the current approved CPM schedule update. Revisions are to be singular in modification and not lumped together in the same revised update unless otherwise directed by the Engineer. Additional revision(s) of the same update is therefore acceptable. The Department reserves the right to request a resequencing of activities to effect a completion date within the Project Time.

The CPMC shall meet as needed with the CPMA at the Engineer's office within five (5) calendar days after revision is required, formal request for a revision, or the Contractor announces intent to submit a revision. The purpose of the meetings shall be to prepare the Contractor's revised update CPM schedule database and its written narrative of changes. These meetings shall continue until a useable, logical draft of the revised update CPM schedule network, responsive to the modification requirements, has been developed that will generate a workable, CPM schedule revised update having a completion date using or within the Contract Time or that allowable by this specification. The submitted CPM schedule database revised update must reflect its written narrative. Revised updates inconsistent with their written narratives will not be acceptable. The CPMA will generate the CPM schedule revised update reflecting the Contractor's new information. The reports generated by the CPM schedule revised update shall be used to prepare the update information for the next CPM schedule update.

Reduction of activity durations will not be considered acceptable criteria for revision to bring the project back on schedule unless activity quantities have been reduced or the Contractor provides a narrative describing how their means and methods to construct the work shall change and/or their resource allocation to perform the work shall increase.

For activities using like resources, modification of activity relationships to be concurrent (run parallel) with each other will not be considered acceptable criteria for revision to bring the project back on schedule unless the Contractor provides a narrative describing how their crews and/or resource allocation to perform the work shall increase.

A CPM revised update having the requirements for the Engineer's approval must be completed before preparation of the next CPM schedule update. Processing of the next monthly estimate for payment will begin only after the Engineer's approval of the signed CPM schedule revised update.

Upon approval of the CPM schedule revised update, the CPMA will furnish the Contractor a graphic and report output of this revised update. This CPM schedule revision is the Contractor's own revised work schedule and the Contractor's responsibility to maintain.

In the event that the Contractor fails to maintain his CPM schedule in a satisfactory manner, the Engineer reserves the right to enforce the provisions as set forth in Standard Specification Subsection 108.10.

Change Orders and adjustment of completion time:

A Change Order will only be considered for extension of Contract Time when the modified critical path shows requirement of additional time because of the added activity or activities and\or there is justifiable delay as recognized and determined by the Engineer. For any change order that affects the schedule, the Department reserves the right to request a resequencing of activities to effect a completion date within the Project Time.

If the CPM schedule has been updated and/or revised and positive total float has been created, no additional time will be given for added activity(s) unless the modified critical path shows requirement of additional time and/or there is justifiable delay as recognized and determined by the Engineer. Compensation for additional overhead costs will not be considered until all of the original Contract Time has been utilized. The Engineer reserves the right to "bank" (postpone the award of) approved time extensions if the project is ahead of schedule.

If a change order represents issues for which the effect on contract time can be readily determined, then any time adjustment will be agreed upon by the CPMC and CPMA prior to final execution of the change order. Determination of time adjustment will be based on the effect of the issue on the CPM schedule, the current approved CPM schedule update or approved CPM revised update, and the Department's Time Evaluation Worksheet (TEW) submitted by the Contractor.

However, if the issues represented by the change order require further analysis and review in order to accurately and fairly evaluate the effect on contract time, then the change order contract time assessment block may be marked “not considered at this time”. This will be done in order to not delay payment to the contractor for completed work included on a particular change order while the time analysis is being performed. In these cases, final resolution of any time related issues would be made as soon as all required information is received and analyzed by the Department and the Contractor.

After signature by all parties, the change order is considered approved, and work activities and any time modifications as shown on the approved TEW that affect the CPM schedule shall be reflected in the next CPM schedule update or revised update and be documented by written narrative. Only activities on the approved TEW may be included as activity(s) in schedule databases. Updates reflecting change order(s) that are inconsistent with their change order narratives will not be acceptable. No change orders will be processed until their effect on the CPM schedule has been determined, unless otherwise approved by the Engineer. A change order may not be included in a monthly estimate for payment unless approved by the Department on or before the cutoff date of the estimate. All official time extensions will be granted by letters from the applicable District Construction Engineer or his/her designated representative.

Issues involving potential time extensions must be addressed in the CPM schedule update period in which they occur or they cannot be considered. If the Contractor proposes a change to the Contract work, any time the Contractor spends in discussion and preparation, and any time the Department requires for review in the approval or disapproval process for this proposed change to the Contract work will not be considered for granting of additional contract time. It is the obligation of the Contractor to complete the project on time according to the original contract documents including current approved changes notwithstanding any change submitted for approval that may or not be accepted. The Contractor is obligated to prosecute the

work at any time according to the Contract Documents in covenant at that time.

If an allowance for weather days has been included in the Completion Date section at the beginning of the Contract Special Provisions, these days shall be identified as Contract Weather Days. The following definitions regarding weather days will be utilized:

Weather day – Any Calendar Day (including weekends and Holidays) on which a weather event prohibits contract work on critical path activities. Events include, but are not limited to rain, snow, or extreme temperatures.

Lost day – Any Calendar Day (including weekends and Holidays) on which residual effects from a weather event prohibit contract work on critical path activities. Examples include, but are not limited to, wet conditions from a previous rain event, snow cover, or frozen ground.

Extensions of Contact Time for weather will not be considered until the total of weather days and lost days as defined above exceed the number of Contract Weather Days as listed in the Completion Date section at the beginning of the Contract Special Provisions. The Contractor and the Department will record and agree on weather days and lost days. A day will be considered a weather or lost day if it prevents progress of the current or next work activity on the critical path of the schedule, unless it occurs during a calendar non-work period of the current or next work activity on the critical path of the schedule in which case the day will not be counted as a weather day. Weekends and holidays will also be excluded from consideration for weather and lost days during calendar non-work periods.

When the total of weather days and lost days recorded in the field exceed the advertised Contract Weather Days, the Contractor will be awarded a day for each day weather or conditions due to previous weather events prevent progress of the current or next work activity on the critical path of the schedule. When weather affects an activity not on the critical path and the activity becomes the critical path, the allowable days of time extension will be only for the days the activity was on the critical path. The Contractor and the Department will record and agree on these weather days. Inability to prosecute work not shown as activities in progress on the most recent CPM schedule will not be considered when determining an extension of Contract Time. The Engineer will have the final decision as to the number of calendar days the Contractor's work was limited to because of weather.

Final (As Built) CPM Schedule Update:

The CPMC shall meet with the Contractor and Resident Engineer and prepare the required as-built work schedule information and corrective work schedule information to finalize the CPM schedule. The progress reports generated by the previous CPM schedule update or revised update will be used to prepare this update information. This final update information shall reflect the final state of the project work. The final update information shall include all activities on which work was performed and/or corrections since the last update period and shall include as a minimum the activity ID and title, the actual start and finish dates, and the actual completion date. The final update information shall also include any revisions and change orders not previously included in the CPM schedule. These correction, revision, and change order modifications shall be reflected by a final update written narrative. The final update information will be as agreed to and signed off by the Resident Engineer and the CPMC. The CPMC will use the signed off information to status the CPM schedule database to prepare the final update schedule.

The Contractor shall submit the final CPM schedule database and a copy of the signed off final update information within five (5) calendar days after formal request for this update. The database and signed off information must match. The CPMA will generate a final CPM schedule update reflecting the Contractor's new information. Upon approval of the final CPM schedule update, the CPMA will furnish the Contractor graphic and report outputs of this final update.

The CPMC shall submit two (2) signed copies of the final CPM schedule update to the CPMA. Processing of the final estimate for payment will begin only after these signed copies are received. This final (as built) CPM schedule is the Contractor's final work schedule.

Method of Measurement:

The Project Control System will be portioned into two (2) items. The item, "Project Control System Development Plan", will be bid price lump sum. The item, "CPM Schedule Updates and/or Revised

Updates", will be unit bid price per each approved update.

Basis of Payment:

The item, "763508 - Project Control System Development Plan", will be paid for at the Contract lump sum bid price, on the next monthly estimate after completion of the requirements of the Project Control System Development Plan, which includes approval of the Original CPM schedule.

The item, "763509 - CPM Schedule Updates and/or Revised Updates", will be paid for at the Contract unit bid price per each approved CPM schedule update. Revised updates are incidental to this item, except that each revised update(s) requested by the Department for purposes of incorporating Plan Revisions will be paid as one (1) approved CPM schedule update.

2/18/13

763510 - SITE FURNISHINGS

Description:

This item shall consist of furnishings and placing the following site furnishings as shown on the Plans and described herein:

Bench - Type A

Manufacturer's cut sheet shall be submitted to Site Engineer for approval prior to manufacturing. The Site Engineer shall retain the right to reject the bench not conforming to this specification and/or approved submittal drawings.

Type: Metal strap with back
Mounting: Surface mounted - bolted to concrete surface
Size: 6' Strap steel scroll Bench with Back
Color: Silver
Material: Ribbed Steel, Ductile iron frame/arm rests
Finish: TGIC polyester Powdercoat
Model: Classic Series CR-140 or equal
Quantity: 9

Bench - Type B

Manufacturer's cut sheet shall be submitted to Site Engineer for approval prior to manufacturing. The Site Engineer shall retain the right to reject the bench not conforming to this specification and/or approved submittal drawings.

Type: Metal strap with back
Mounting: Surface mounted - bolted to concrete surface
Size: 6' Strap steel scroll Backless Bench
Color: Silver
Material: Ribbed Steel, Ductile iron frame/arm rests
Finish: TGIC polyester Powdercoat
Model: Classic Series CR-144 or equal
Quantity: 8

Bench manufacturers:

1. Victor Stanley
   P.O. Drawer 330
   Dunkirk, Maryland 20754 USA
   Tel: 301.855.8300/Fax: 410.257.7579

2. Keystone Ridge Designs
   670 Mercer Road
   Butler, PA 16001
   Tel: 800.284.8208/Fax: 724.284.1253

3. Landscape Forms, Inc.
   431 Lawndale Ave.
   Kalamazoo, MI 49048
   Tel. 800.430.6209/ Fax 269.381.3455

   Or Approved Equal

Bench - Type C

Manufacturer's shop drawings shall be submitted to Site Engineer for approval prior to manufacturing. The Site Engineer shall retain the right to reject the shaded bench not conforming to

this specification and/or approved submittal drawings.

Bus Shelter Type - Two-column square tubular steel
Mounting: Bolted to concrete footing (inclusive)
Roof - Gable shelter; 24 gauge multi-rib metal seam; 4:12 pitch;
Color: Posts: Dutch Blue
Roof: Ash Grey
Bench: Ash Grey
Column Size: 5 x 5 x 3/16"
Base connection: Below grade column base
Finish: Powdercoat
Model: SG8X8S-P4 or approved equal
Bench Type: Metal Strap
Quantity: 4

Bench manufacturers:

1. ICON Shelter Systems Inc.
   Lincoln Avenue
   Holland, MI 49423
   Phone: (616) 396-0919 Toll Free: (800) 748-0985/Fax #: (616) 396-0944
   Email: info@iconshelters.com

2. Victor Stanley
   P.O. Drawer 330
   Dunkirk, Maryland 20754 USA
   Tel: 301.855.8300/Fax: 410.257.7579

3. Landscape Forms, Inc.
   431 Lawndale Ave.
   Kalamazoo, MI 49048
   Tel. 800.430.6209/ Fax 269.381.3455 manufacturer:

   Or Approved Equal

Bicycle Racks

Manufacturer's shop drawings shall be submitted to Site Engineer for approval prior to manufacturing. The Site Engineer shall retain the right to reject the bicycle rack not conforming to this specification and/or approved submittal drawings

Mounting: Surface mount with galvanized wedge anchor
Size: Four (4) and five (5) bike capacity units
Model type: Perpendicular, single sided
Model Numbers: LR-P-4-SM-P and LR-P-5-SM-P or approved equal
Material: Galvanized Steel
Finish: Galvanized
Model: Lightening Bolt LR Series or approved equal
Quantity: Four unit model - Fourteen (14)**
Five unit model - Three (3)**

**Refer to drawings for locations. Location specifies total number of bike spaces required. Multiple bike rack units will need to be assembled to total required quantities.

Bike Rack Manufacturers:

1. Creative Pipe, Inc.
   P.O. Box 2458
   Rancho Mirage, California 92270-1087
   Telephone: 760.340.5555/Fax: 760.340.5883

2. Landscape Forms, Inc.
431 Lawndale Ave.
Kalamazoo, MI 49048
Tel. 800.430.6209/ Fax 269.381.3455

3. Keystone Ridge Designs
670 Mercer Road
Butler, PA 16001
Tel: 800.284.8208/Fax: 724.284.1253

Or Approved Equal

Kiosks/Display Shelter

Manufacturer's shop drawings shall be submitted to Site Engineer for approval prior to manufacturing for the kiosks/display shelters. The Site Engineer shall retain the right to reject the kiosk/display case not conforming to this specification and/or approved submittal drawings

Kiosk\ Type - 8' Two-column square tubular steel
Mounting: Bolted to concrete footing (inclusive)
Display Case: Double Sided
Roof - Gable shelter; 24 gauge multi-rib metal seam; 4:12 pitch;
Column Size: 5 x 5 x 3/16"
Color: Posts: TBD at shop drawings - submit color samples
Roof: TBD at shop drawings - submit color samples
Finish: Polyester powercoat
Base connection: Below grade column base
Display Cabinet: Double-sided, satin anodized aluminum cabinet; lockable doors mounted on full length piano hinges; shatter resistant acrylic windows with natural cork interior mounting boards.
Quantity: Two (2)

Kiosk Manufacturers:

1. ICON Shelter Systems Inc.
1455 Lincoln Avenue
Holland, MI 49423
(616) 396-0919 Toll Free: (800) 748-0985/Fax #: (616) 396-0944
Email: info@iconshelters.com

2. The Tablet & Ticket Co.
1120 Atlantic Drive
West Chicago, IL 60185
Tel. 800-438-4959 Toll Free/Fax. 630-231-0211

3. KirbyBuilt
5333 S. Emmer Drive
New Berlin, WI 53151
Tel. 1-866-965-4729

Or Approved Equal

Fasteners

All fasteners for site furnishings, such as anchor bolts, shall be galvanized ASTM A307 Grade A and tamper proof unless otherwise stated. Use touch up paint to paint the exposed surface of the fasteners. The touch-up paint shall be supplied by the manufacturer. The color shall match the finish of the part of the site furnishings that is closest to the fastener.

Method of Measurement:

Furnishings

The quantity of site furnishings will be measured as the total number of various site furnishings as specified in the Contract and as installed and accepted by DelDOT Representative.

Basis of Payment:

Site Furnishings

The quantity of the site furnishings will be paid for at the Contract lump sum price per the site furnishings scheduled in the Contract. Price and payment will constitute full compensation for furnishing and placing all materials, including excavation, fasteners and hardware, concrete, leveling, backfilling, cleanup, disposing of the surplus material, for all labor, tools, and equipment including necessary incidentals to complete the work. Contractor is responsible for protecting site furnishings from damage until the completion and acceptance of all site furnishings work.

Payment for the various items of site furnishings as described above may be processed if, in the opinion of DelDOT's representative all work required is satisfactorily completed for each type of site furnishing. No partial payment will be made.

The breakout sheet attached to the proposal shows all site furnishings proposed for this contract. The contractor shall fill in each unit price and cost (unit price times the proposed quantity) for each site furnishing listed. The lump sum price bid for item 763510- Site Furnishing shall be the sum of the total cost for all site furnishings listed. The completed breakout sheet shall be attached to the bid proposal. Failure to submit the breakout sheet with the Bid Proposal will result in the Bid proposal be declared non-responsive and rejected.

The department reserves the right to delete from the Contract the furnishing and installing of one or more of site furnishings listed and the right to add or subtract from the quantity. The lump sum to be paid will be adjusted in accordance with the contractor's unit prices as required above. There will be no extra compensation to the contractor if such additions and /or deletion are made.

Payment for the site furniture as described above may be processed if, in the opinion of the engineer, all work required and is satisfactorily completed. No partial payment will be made for site furnishings until and unless the site furnishings are delivered and placed according to specifications. No additional payment will be made for using site furnishings other than specified.

6/28/13

763512 - ELECTRICAL SERVICE SYSTEM

Description:

The work specified in this item consists of the supply and installation of electrical service, controls, lighting, and other items as indicated on the Contract plans or as herein specified. The work required under this item includes the following and incidental work related thereto:

a. Furnishing and installing exterior lighting and controls in the Delaware Department of Natural Resources and Environmental Controls (DNREC) Park, including path lights along the promenade in the north and south parks.
b. Furnishing and installing pole mounted exterior lighting and controls.
c. Power distribution centers, including panelboards, meter sockets and all conduit and wiring for complete primary and secondary power feeders.
d. Furnishing and installing RV power centers for the proposed RV Campground in the north park.
e. Furnishing and installing additional RV power centers for the expansion of the existing "New Camp" RV Campground in the south park.
f. Furnishing and installing electrical service connections to the following buildings:

1. Building 1W (Contact Station)
2. Building 1E (Contact Station)
3. Building 2 (Contact Station)
4. Building 3 (Laundry Facility)
5. Building 4 (Bath House)
6. Building 5 (Bath House)
7. Building 7A (Pavilion)
8. Building 7B (Pavilion)
9. Building 7C (Pavilion)
10. Building 7D (Pavilion)
11. Building 8 (Bath House)
12. Building 9 (Bath House)
13. Amphitheater (South side)

General:

Related Documents:

Drawings and general provision of Contract, including General and Supplementary conditions, apply to work of this section.

State of Delaware Standard Specifications
Section 744 – Conduit Junction Wells
Section 745 – Conduits (Non-metallic or Galvanized)
Section 746 – Pole Bases
Section 603 – Bar Reinforcement
Section 812 – Portland Cement Concrete

Delaware Department of Transportation (DelDOT) Standard Specifications for Road and Bridge Construction, August 2001 Edition.

Delaware Department of Transportation Standard Construction Details, 2002.

American National Standards Institute (ANSI).

American Society for Testing Materials (ASTM).

National Electrical Manufacturers Association (NEMA).
ICS 4: Standards for Terminal Blocks
KS 1: Standards for Disconnect Switches
PB 1.1: Standards for Panelboards

VE 1: Standards for Cable Tray Systems
VE 2: Standards for Cable Tray Installation

Definitions:

a. PVC – Polyvinyl Chloride
b. NEC – National Electric Code
c. UL – Underwriter Laboratories, Inc.
d. USCG – United States Coast Guard
e. DNREC – Delaware Department of Natural Resources and Environmental Control
f. RV – Recreational Vehicle
g. DelDOT – Delaware Department of Transportation
h. FAA – Federal Aviation Administration
i. GFCI – Ground Fault Circuit Interrupt
j. LED – Light Emitting Diode

Submittals:

All shop drawings pertaining to work completed under this item shall be prepared and submitted to the Owner's Representative for approval in accordance with standard construction practices. Completion of task without approved shop drawings shall be subject to removal and reinstallation at the discretion of the Owner's Representative.

Quality Assurance:

All electrical work shall be performed and all materials provided shall be in accordance with the National Electrical Code. Code shall be the minimum requirements for the electrical work and if there is a conflict between the requirements specified in the Contract plans and the code, the more stringent requirement will apply as determined and approved by the Engineer.

Unless otherwise indicated, provide electrical materials and equipment that are the standard product of manufacturers regularly engaged in the production of such materials and equipment. Provide the manufacturer's design. When two or more units of the same class of material and equipment are required, these units shall be the product of the same manufacturer.

Workmanship and materials shall be guaranteed for one (1) year from date of final completion of project. Installation shall be in strict accordance with manufacturer's specifications and instructions. All items shall be in satisfactory operating conditions before acceptance by Owner.

Materials are to be handled in such a manner as to preserve their quality and acceptability for work.

Coordination:

Coordinate with other sections of the Specifications to ensure proper scheduling for delivery and installation of the work specified herein. Coordinate with other sections to ensure that proper provisions are made for the installation of the work specified herein.

Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the work.

Coordinate with Delmarva Power for power requirements and energizing of electrical equipment and lighting. Provide all materials required by them for installation of service, and install per their standards.

Regulatory Requirements: All installations shall conform to all Federal, State and local codes, ordinances, and laws having jurisdiction over this project. In the event of a conflict between these Specifications and above-mentioned codes, the more stringent of the two shall govern.

All installations and equipment shall conform to applicable UL and electrical codes.

Delivery, Storage, and Handling: Deliver to site and properly store, protect and handle products at the site. Deliver products to the site in sealed and labeled packages; inspect to verify acceptability.

Operating and Maintenance Instructions: Upon completion of all work and tests, instruct the Owner's representative in the operation, adjustment and maintenance of all electrical systems and equipment. Instruction shall be provided as directed by the Engineer, and divided into the two (2) hour sessions, each session held at a time directed by the Engineer.

The instructor shall be factory trained and thoroughly familiar with all parts of the system or equipment on which he is to give instruction.

Materials:

General: All electrical materials and equipment shall be new, shall carry a U.L. label when such material, equipment and/or system are of a type or class listed by the Underwriters Laboratories, Inc., and shall be suitable for the conditions and duties imposed on them. If a U.L. label is not available from the manufacturer, when requested or required by the local authority having jurisdiction, the equipment shall be tested by an approved electrical testing company in accordance with NEC. Submit data indicating compliance with standards prior to installation. The description, characteristics, and requirements of materials to be used shall be in accordance with qualifying conditions established in the following sections.

All component parts of each item of equipment or device shall bear the manufacturer's nameplate, giving the name of manufacturer, description, size, type, serial or model number, electrical characteristics, etc., in order to facilitate maintenance or replacement. The nameplate of a subcontractor or distributor will not be acceptable.

Electrical Conduit and Fittings: Materials shall conform to the requirements of Delaware Standard Specification Section 745.02.

Size of conduits shall be as indicated on the Contract plans. Where size is not indicated, it shall be in accordance with the requirements of the National Electric Code. Unless otherwise indicated, the minimum size conduit shall be 3/4 inch.

Conduit in DNREC Park areas shall be PVC schedule 80 and shall be gray in color. Schedule 80 PVC conduit shall meet the requirements of UL.

Flexible conduits shall be UL listed, liquid-tight, PVC covered hot dipped galvanized steel.

Fittings shall be of the same material and finish as the raceways and shall meet requirements of UL and ANSI. Threaded connections shall be used for all rigid metal conduits.

Boxes and Enclosures: All exposed boxes shall be of a weatherproof type provided with screw fastened gasketed covers. All boxes shall have threaded hubs. Enclosures shall be the size specified in the Contract plans. If box size is not specified, each box shall have sufficient volume to accommodate the number of conductors in the box, in accordance with the requirements of the NEC.

Wire and Cable – 600 Volts and Below:

General: Conductors shall be copper, 98 percent conductivity, soft annealed copper meeting requirements of ASTM B33. Conductors No. 8 AWG and larger shall be stranded.

Wire and cable shall be delivered to the job site in full coils or reels, each bearing a tag containing the UL approval stamp, name of manufacturer, trade name, code, type of wire, and month and year of manufacture.

All wire(s) to be used in this Contract shall be manufactured in conformance with the National Electric Code, insulated for 600 volts, and be of the type THHN/THWN.

Insulation: Wires and cables for maximum 600 VAC power circuits and control circuits shall be THHN/THWN. The insulating tape shall be of the self-bonding type.

Jacket Type: The jacket type shall be of the waterproof type.

Lubricant: The Contractor shall use soapstone powder as lubricant.

Waterproof Compound: The Contractor shall provide a sealing type of waterproof compound for painting of rubber tape, as directed by the engineer.

Splices: Splices shall be mechanically secured by means of a standard tinned copper pressure type connector. Splice connectors for No. 10 AWG and smaller gauge solid conductors shall be insulated pressure twist-on nut type. Splice connectors for No. 8 AWG and larger gauge conductors shall be split bolt or compression type for making parallel or but splices. Provide companion performed plastic insulating covers or tape equivalent to conductor insulation. Splices shall be kept to a minimum and only used where absolutely required, and as approved by the Engineer. Splices shall only be made in approved enclosures.

Connector kits shall be I fused and unfused connector kits and Y fused and unfused connector kits as specified on the Contract plans. All connector kit housings shall be made of water resistant synthetic rubber suitable for burial in the ground or exposure to sunlight. Each housing shall form a watertight seal around the cable at the point of disconnection and between the insert body and enveloping Y housing.

Terminal Lugs: Provide solderless terminal lugs for stranded and multiple solid conductors at connection to terminals or use UL listed crimp tool compression style lugs.

Identification: Wire and cable shall have the following information surface printed at regular intervals throughout their entire length:

a. Manufacturer or trade name
b. Size of conductor
c. Type of insulation
d. Voltage classification
e. Color coding

Color Coding: Color coding shall be provided throughout the entire network for service, feeder, branch, control and low energy signal circuit conductors. Conductors shall have factory impregnated color throughout their entire length. Color shall be green for grounding conductors, and white or gray for neutrals. The color of conductors for different voltage systems shall be as follows:

SYSTEM	PHASE A	PHASE B	PHASE C	NEUTRAL	GROUND
240/120	black	red	-	white	green

Grounding: Ground Wire and Ground Rods. Ground wire shall be bare solid copper. Ground wire shall be of the size as shown in the Contract plans. Ground rods shall be 0.75 inches in diameter, a minimum of 10 feet in length, with a steel core and copper jacket. Ground rods shall be UL approved and supplied with clamps for connecting the grounding conductor to the rod.

Concrete Foundations: Dimensions of the foundations shall be as specified in the Contract plans. Contact the appropriate manufacturer to obtain anchor bolt dimensions. Pole base materials shall conform to the requirements of Delaware Standard Specification Section 746.02.

Lumber:

RV Power Center: The power center shall be mounted on 6 in. x 6 in. salt treated wood posts by electrical contractor Southern Pine (CCA 0.6 PCF), or approved equal. Post tops shall be cut to a point on a 45-degree angle.

RV Distribution Center: The distribution center shall be mounted on 6 in. x 6 in. salt treated wood posts by electrical contractor Southern Pine (CCA 0.6 PCF), or approved equal, spanned by 2 in. x 12 in. salt treated wood boards. Post tops shall be cut to a point on a 45-degree angle.

North Park Receptacle Post: The duplex receptacle boxes shall be mounted on 4 in. x 4 in. salt treated wood posts by electrical contractor Southern Pine (CCA 0.6 PCF), or approved equal. Post tops shall be cut to a point on a 45-degree angle.

Luminaires, Lamps, and Lighting Structures:

See Contract plans for details of the luminaires, lamps, and lighting structures.

LED Path Lights: LED lights to illuminate the walkway along promenade and driveway areas shall be wired for 18-watt, 12V LED clusters. Lights will be installed along the north and south side promenade as shown in the plans. The LED path lights shall be fed by a 120v-12v transformer located in a weatherproof junction box. Light fixture shall require a half dome to illuminate pathway only. The Luminaire shall be UL listed for exterior wet locations. LED lights shall be manufactured by Kim Lighting – model LTV 73H, or Approved Equal.

Pole Mounted Lights: Luminaires shall be CAND2 series clear polycarbonate LED lamps manufactured by Phillips Lumec, model 65W42LED4K-R, 65-watt lamp wattage, 70-watt total system wattage and 120 V lamps, or Approved Equal.

Globe finish shall be clear polycarbonate (PCC).

Fabrication: Fit and shop assembled components in largest practical sizes for delivery to site. Fabricate components with joints tightly fitted and secured. Exposed mechanical fastenings shall be flush countersunk screws or bolts, unobtrusively located, consistent with the design of the component, except where specifically noted otherwise.

Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

Lighting Control Devices:

a. Timer for LED Path Lights
b. Timer for Pole Mounted Lights

Timers for the LED path lights shall be a digital 365-day astronomical timers with holiday and seasonal scheduling. Operating voltage shall be 120V. Timers shall be programmed to turn on at dusk and off at dawn unless otherwise directed by DNREC. Timer shall be mounted near panelboard that supplies the LED fixtures.

The controller shall program in AM/PM format with one-minute resolution. The display shall be of LCD type. The controller shall be capable of 99 set points and separate scheduling for each day of the week. The controller shall have 365-day holiday capabilities with 24 single dates and 4 seasons of unlimited duration. Different daily schedules shall be programmable within each season. The controller shall have Daylight Savings time and automatic Leap Year correction. The controller shall be astronomic with 1-99 minutes +/- offset from Sunrise or Sunset. The unit shall have a NEMA Type 3 indoor/outdoor enclosure. The controller shall have permanent schedule retention for up to 40 years and a 30-day backup for real time using field replaceable 9V lithium battery. The controller shall be capable of manual override ON or OFF to the next scheduled event using one button.

Photoelectric Controls for LED Path Lights: A photocell shall be provided with each transformer and mounted in a suitable location not subject to damage. The standard photocell housing shall be supplied with a 20 ft. pigtail of 16 AWG Type TFFN wire. Any additional wire or different gauge wire shall be supplied by the Contractor. The photocell shall be in a sealed unit. A suitable mounting bracket and all necessary mounting hardware and conduit shall be furnished.

Timer for Pole Mounted Lights: Timers for the LED path lights shall be a digital 365-day astronomical timers with holiday and seasonal scheduling Operating voltage shall be 120V. Timers shall be programmed to turn on at dusk and off at dawn unless otherwise directed by DNREC. Timer shall be mounted near panelboard that supplies the fixtures.

The controller shall program in AM/PM format with one-minute resolution. The display shall be of LCD type. The controller shall be capable of 99 set points and separate scheduling for each day of the week. The controller shall have 365-day holiday capabilities with 24 single dates and 4 seasons of unlimited duration. Different daily schedules shall be programmable within each season. The controller shall have Daylight Savings time and automatic Leap Year correction. The controller shall be astronomic with 1-99 minutes +/- offset from Sunrise or Sunset. The unit shall have a NEMA Type 3 indoor/outdoor enclosure. The controller shall have permanent schedule retention for up to 40 years and a 30-day backup for real time using field replaceable 9V lithium battery. The controller shall be capable of manual override ON or OFF to the next scheduled event using one button.

Photoelectric Controls for Pole Mounted Light: A photocell shall be provided with each pole mounted fixture. The standard photocell housing shall be supplied with a 20 ft. pigtail of 16 AWG Type TFFN wire. Any additional wire or different gauge wire shall be supplied by the Contractor. The photocell shall be in a sealed unit. A suitable mounting bracket and all necessary mounting hardware shall be furnished.

Electrical Service Equipment:

Circuit Breakers: Circuit breakers shall be molded case type having a minimum rating of 10,000 amp interrupting capacity (AIC) and be quick make, quick break, thermal magnetic, trip indicating, and have common trip on all multiple breakers with internal tie mechanism. For circuit breaker frame sizes 125 amp and smaller, bolt-on circuit breakers shall be used. The circuit breakers shall have the current and voltage ratings and number of poles as specified in the Contract plans, and shall be treated to resist fungus and be ambiently compensated for the enclosure and proximity to adjacent breakers.

Panelboards: Panelboards shall conform to Federal Specification W-P-115 and shall be suitable for operation on the voltage and type service specified in the Contract plans. They shall be UL listed and labeled. Panelboards shall be equipped with the number and size of circuit breakers specified. Circuit breakers in panelboards shall conform to Federal Specification W-C-375 and shall be bolted to copper busses. Buss ratings shall be as specified. Lugs shall be compression style, suitable for number, size, trip ratings, and conductor materials.

Receptacles: All receptacles shall be GFCI duplex receptacles, rated 125 Volts, 20 amp, 3-wire with integral ground fault current interrupter. Receptacles shall detect and trip at a current leakage of 6 millamperes and shall have front mounted test and reset buttons. Weatherproof in-use covers shall be rain tight while-in-use corrosion resistant covers. Covers shall be NEMA 3R rated, UL listed. Receptacles shall be mounted in a cast metal box with gasketed, weatherproof, cast-metal cover plate.

4-20 Amp GFCI duplex receptacles shall be furnished and installed under the bridge in the north park as indicated on the Contract plans. Two, double gang receptacle boxes shall be mounted back to back on weather treated wood post. The while-in-use covers shall be padlockable.

RV Power Center: The RV power center shall be multi outlet enclosure with ULOOP (1/0 loop feed lug kit). The power center shall be UL listed with a VALOX thermoplastic enclosure and corrosion resistant internal components. A hinged cover shall close over plugs and cords. The enclosure shall be weather tight. The power center shall have 50A, 30A, and 20A receptacles with a 7-watt light and photocell. The light circuit shall be protected by a 20A circuit breaker. The light cover shall be molded of LEXAN polycarbonate. Housing shall be tan in color.

Transformers: Transformers shall be provided by Delmarva Power and sized by them, as required. Transformer pads shall be supplied by Delmarva Power and installed by the Contractor. The Contractor shall contact the Delmarva Power representative specified on the Contract plans two weeks in advance to arrange for delivery of the transformer pad. The Contractor shall install 4 inch Schedule 40 PVC Conduit (gray in color) for the primary electric service.

Construction:

General:

Verify that field conditions are acceptable and are ready to receive work. Beginning of work means the Contractor accepts existing conditions.

All equipment installations shall conform to NEC, local utility company requirements, and State and local laws ad ordinances governing the work. All electrical work shall be accomplished under the direct supervision of a master electrician. All work performed shall be performed by a journeyman electrician. The Contractor shall obtain and pay for all permits, licenses and inspection fees.

The Contractor shall furnish all labor, material, instruments, fuel, and power required to perform all necessary tests. All tests shall be to the complete satisfaction of the Engineer. All defective materials and/or workmanship discovered as a result of these tests shall be removed and replaced at the Contractor's expense and the test repeated.

Install metallic raceway, fitting, boxes, and cabinets free from direct contact with reinforcing steel.

Provide fasteners, anchor bolts, anchorage items and supports as required to insure proper and rigid alignment. Attach equipment with fasteners sized according to size and weight of equipment and thickness of supporting surfaces. All hardware for outdoor use shall be stainless steel.

Make metallic conduit electrically and mechanically continuous and ground as required. Conduits shall be continuous between outlets, boxes, cabinets, and panelboards and shall enter and be secured to each box. Provide ground conductors in each conduit run.

Stored materials, even though approved before storage, may again be inspected prior to their use in work. Stored materials shall be located so as to facilitate their prompt inspection.

Electrical Conduit and Fittings:

Construction methods shall conform to the following Delaware Standard Specifications Subsections:

Under existing pavement, PVC	745.03 (b)
Under new pavement, galvanized and PVC	745.03 (c)

Bends: Make changes in direction with bends and fittings. Field-made bend and offsets shall be made with a hand bender or conduit-bending machine. Bending of conduits with a pipe tree or vise is prohibited. Flattened, dented, or deformed conduits are not permitted. Remove and replace the damaged conduits with new undamaged material. Conduit run shall have no more than the equivalent of three 90-degree bends within 125' between boxes or two 90-degree bends within 75'. Pull boxes shall be provided where shown, specified or wherever required to pull conductors and to meet the above requirement.

Connections: Conduit runs shall be made with as few couplings as standard length will permit. Rigid steel conduit connections shall be threaded. Field cut threads of galvanized conduit shall be painted with approved galvanizing repair paint prior to assembly. Nonmetallic conduit shall be connected by a solvent welding process. Fittings for electrical metallic tubing (EMT) conduit shall be watertight cast ferrous compression type.

Conduit Terminations: Pull boxes or conduit bodies shall be used at conduit terminations. Conduits terminating in case iron junction boxes shall be threaded into hubs with bonding screws furnished and installed on the interior of the box. Conduits terminating in junction boxes without hubs shall be secured with two lock nuts with an insulated grounding bushing furnished and installed. Conduits terminating at concrete foundations and junction wells shall be secured as specified in the Contract plans. All ends of unused conduit shall be capped.

Cleaning and Capping: Prior to installation of conductors in any run, the conduit shall be checked for cleanliness and all obstructions removed. Each conduit run and all fittings shall be cleaned of all debris by a pull through mandrel type device inserted in the presence of the Engineer. All ends of conduits shall be capped by use of a manufactured cap or plug. Prior to the installation of wiring, manufactured caps or plug shall be removed and an insulated bonding bushing for galvanized rigid conduit or bell end fitting for PVC conduit installed. Repair cuts, nicks and abrasions or replace damaged conduits as directed.

Pull Wire: After installation, all conduits shall have a pull wire or cord installed. Pull wire or cord shall be made of corrosion resistant material with a minimum breaking strength of 200 lb.

Exposed Conduit: Exposed conduit runs shall be parallel to, or at right angles to, walls, slabs, girders, etc. Conduit shall be located to minimize accumulation of dirt. Conduit shall be attached to steel, concrete, masonry, or timber by straps, clamps or hangers of an approved type made of stainless steel or galvanized malleable iron.

Boxes, Enclosures and Cabinets:

Install enclosures at indicated or approved locations in accordance with manufacturer's instructions and at convenient operating height such that unless shown otherwise, no manually operable device will be within 2 feet of the floor or higher than 6 ½ feet above the floor. Adjust straight and plumb and fasten enclosures securely in place. Align securely and independently fasten each section of multi-section enclosures.

Wire and Cable – 600 Volts and Below:

The Contractor shall provide adequate equipment satisfactory to the Engineer for installation of wire; and shall pull all wire through conduits in a manner which will not overstress, or stretch any wire, and shall use precautions so as not to score, cut, twist, or damage the insulation and/or the jacket. In pulling the wire into conduits, where the strain on the wires is likely to be excessive, the Contractor shall use soapstone powder as lubricant. Without exception, all wires in junction or fuse boxes, transformer bases, and service panelboards shall be provided with a sufficient slack; and shall be arranged in a neat and orderly manner. After wires have been installed, and pending permanent connection or splicing, the end of each wire shall be carefully sealed using rubber tape, and painted with a sealing type of waterproof compound. All wiring shall be furnished to give a neat and orderly appearance. Wires shall be supported on cable rack assemblies in all junction wells and junction well foundations. Wires in distribution cabinets shall be neatly arranged and laced with cable ties.

Where two or more wires occupy the same conduit, they shall be drawn in together and be kept parallel to each other by means of a pulling head. Phase legs shall be arranged circumferentially and in sequence around neutral wires.

Wires shall be spliced in junction wells or junction boxes as previously described. Splices shall then be wrapped with half-lapped layers of insulating tape installed in opposite directions. Several layers of half-lapped jacket tape shall be applied over the insulating tape. Two coats of waterproofing sealant shall be applied over the complete splice.

The Contractor shall install complete raceway system and clear debris and moisture before conductor installation. Leave a minimum of 6" of free conductor at each connected outlet. Conductors shall be identified by circuit number at all pull and junction boxes. Conductors terminating at terminal blocks shall be identified with numbers and/or letters identical to the circuit or control identification.

Electrical Identification:

General: Identify and label each piece of equipment and conductor. Develop a schedule for labels showing the text of each as shown on the Drawings, schedules and by the nature of the system. In the absence of specific data, the Contractor shall develop text from the nature of the service or system and submit for approval by the Engineer. The text shall be arranged to produce a legible comprehensive identification system.

Conductor Identification: Power conductors terminating in the NEMA enclosure shall be identified at each end and in intervening junction and pull boxes. Where feeder conductors pass through a common box, tag the feeder to indicate the electrical characteristics and circuit number for terminals and on exposed portions of conductors within pull and junction boxes.

Wire markers shall be clop sleeve or sleeve type, made of PVC, nylon, or delrin, white in color, with black letters impressed in the material. On wire too large for the standard sleeve sizes, sleeve type markers shall be used, inserted on a cable tie and the tie then installed around the wire.

Grounding: Unless otherwise specified, ground all non-current carrying metallic parts of electrical equipment and the neutral of all wiring systems in accordance with the NEC and other applicable codes.

Bond the grounding conductors to metallic enclosures at each end and to all intermediated metallic enclosures. Where equipment contains a ground bus, extend and connect grounding conductors to that bus. Run ground conductors inside conduits enclosing the power conductors.

Make connections of grounding conductors to circuits 20 amps or above by a solderless terminal and a 5/16" bolt tapped to the equipment housing. Ground connections to smaller equipment grounding system with groundings clips mounted directly on the box or with 3/8” machine screws. Remove all paint, dirt or other surface covering at grounding conductor connection points so that good metal-to-metal contact is made.

Concrete Foundations: Construction methods for pole bases shall conform to the requirements of Delaware Standard specification 746.03.

Non-standard bases shall conform to the dimensions as indicated in the base detail on the Contract plans. Provide fasteners, anchor bolts, anchorage items and supports as required to insure proper and rigid alignment. Attach equipment with fasteners sized according to size and weight of equipment and thickness of supporting surfaces. Anchor bolts shall be plumb. Suitable templates for setting anchor bolts shall be accurately placed and left in place until the concrete has attained its initial set.

All concrete shall be mixed, handled, placed, cured, and tested in accordance with all applicable requirements. It is the intent that all foundations be poured against existing, undisturbed earth. Where the existing ground, however, will not retain its shape during excavating operations, or if the excavation should show any tendency to cave-in before pouring the foundation, a sleeve or form shall be provided to retain the earth and receive the concrete. Sleeves or forms shall be of the required size and shall be carefully placed. Exercise care during concrete pour operations to avoid movement or displacement of reinforcing cage or template-set anchor bolt template. Precast concrete caps will not be permitted. The entire case shall be placed as a unit, forming a one-piece monolithic concrete structure. No portion of the form or sleeve shall be left above the finished grade after concrete has cured.

Conduits entering the base must enter only in the designated area. A minimum distance of 1 inch shall be maintained between conduits and a minimum distance of 2 inches between conduits and the ground rods. A minimum of 8 feet of the ground rod shall be driven into undisturbed soil through the 2 inch PVC sleeve. The PVC sleeve shall be driven into the ground so that the top of the sleeve will be flush with the concrete when the base is poured.

Light Installation:

General: Install in accordance with manufacturer's shop drawings. Thoroughly clean any dirt and residue from luminaires prior to installation. Install components plumb and level, accurately fitted, free from distortion or defects. Provide anchors, plates, angles and other fasteners required. Site furnishings shall be located where indicated on the Drawings. Secure post mounted furnishings with appropriate anchor bolts and expansion shields each, or expansion bolts as appropriate.

Attach appropriate grounding straps where specified on drawings to form a continuous grounding circuit where required. Touch-up welds with primer. Grind welds smooth. Conceal bolts and screws whenever possible. Maximum allowable offset from true alignment is ¼ inch. Protect furnishings from damage and defacement until acceptance by Owner. Replace any damaged or defaced furnishings with new units prior to acceptance at no additional cost to the Owner. Install lamp(s) in each fixture. Adjust luminaires that require field adjustment or aiming.

Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 468A and UL 468B.

Cleaning: After installation has been completed and prior to the performance test, refractors and reflectors shall be cleaned with a product approved by the manufacturer.

LED Path Lights: LED path lights shall be installed next to driveway or promenade walkway. LED path lights shall be installed according to the Contract plans and in accordance with manufacturer's recommendations and instructions.

Pole Mounted Lights: Lighting units shall be placed on the new concrete foundations as indicated and in accordance with manufacturer's recommendations and instructions. Install components plumb and level, accurately fitted, free from distortion or defects. Provide anchors, plates, angles and other fasteners required.

Lighting Control Devices:

a. Timer for LED Path Lights
b. Timer for Promenade Lights
c. Timer for USCG Lights

Timers shall be mounted as directed by the Engineer in the field. All timers shall be installed in accordance with Manufacturer's recommendations and instructions.

Photocell: Photocells shall be installed as directed by the Engineer in the field and in accordance with manufacturer's recommendations and instructions.

Electrical Service Equipment:

Meter Socket: Meter sockets shall be provided as required by Delmarva Power. Hardware for attaching the meter socket to a cabinet, wood post, or other structure shall be provided by the Contractor. All hardware shall be stainless steel.

Utility Connections: The Contractor shall arrange a meeting with the utility companies representatives as specified in the Contract plans to establish a schedule for utility connections before any control equipment or material is ordered. The Contractor shall not de-energize, reconnect, tamper with or otherwise handle any of the utility company's facilities.

The Contractor shall make the necessary arrangements with the utility company to ensure having needed utilities available at the time of turn on. Any utility service connection or disconnection delays will not be a valid reason for any time extension. Difficulties in securing utility company services are to be reported to the Engineer at the earliest possible time. All utility company service connection or disconnection costs will be the responsibility of the Contractor.

Panelboards: Install panelboards and accessories according to NEMA PB 1.1. Comply with mounting and anchoring requirements specified in the Contract plans. Mount plumb and rigid without distortion of box. Install overcurrent protective devices and controllers. Set field-adjustable switches and circuit breaker trip ranges. Install filler plates in unused spaces. Arrange conductors in gutters into groups and bundle and wrap with wire ties after completing load balancing.

Receptacles: Receptacles shall be mounted as shown on the Contract plans. Connect receptacles to branch circuits using pigtails that are not less than 6 inches in length. When conductors larger than No. 12 AWG are installed on 20 Amp circuits, splice No. 12 AWG pigtails for device connections. Where required, use a terminal block to tap down to a No. 12 AWG.

Receptacles in the north park under the bridge shall be mounted back to back on a 4 in. x 4 in. weather treated wood post as shown on the Contract plans. The Contractor shall provide all mounting hardware.

RV Power Center: The RV power center shall be installed on wood post as specified in Contract plans and in accordance with manufacturer's recommendations and instructions. The loop feed lug kit (ULOOP) shall be field installed by the Contractor.

RV Distribution Center: Electrical equipment for the RV distribution center shall be mounted on a timber structure according to Contract plans. The Contractor shall provide all mounting hardware.

Transformers: The Contractor shall install transformer pad for Delmarva Power at the location indicated on the Contract plans. Delmarva Power shall install the transformer. The Contractor shall stub conduit into the transformer. The Contractor shall furnish and install sufficient slack in the secondary conductors at the transformer for termination. The Contractor shall furnish all required secondary conductor termination hardware for Delmarva Power. Delmarva Power shall install the conductor terminators and terminate all conductors in the transformer. Delmarva Power shall furnish and install primary electric.

Method of Measurement:

The quantity of "Electrical Service System" will be measured in accordance with the attached Breakout Sheet.

Basis of Payment:

The payment for this item shall be made at the Contract Lump Sum price bid for the item "Electrical Service System". The payment will be full compensation for all items listed herein necessary to construct the complete electrical and lighting system for the RV Park, and north and south park lighting and buildings or alternate bid items. The Contract Lump Sum includes all labor, equipment, tools, and incidentals necessary to complete the work in accordance with the Contract plans and these Specifications. The Breakout Sheet(s) attached shows all work proposed for Item 763512. The Contractor shall fill in the price and the cost (unit

price x proposed quantity) for each item of work listed. The Contract Lump Sum price bid shall be the sum of the total cost for all items listed. The completed Breakout sheet shall be attached to the bid proposal. Failure to submit the Breakout Sheet with the bid proposal will result in the bid proposal be declared non-responsive and will be rejected.

Payment for "Electrical Service System" as described above may be processed if, in the opinion of the Engineer, all work required herein is satisfactory completed. No partial payment will be made for any work unless completed in accordance with these specifications.

6/28/13

763569 - BUILDINGS

Description:

This work consists of all equipment, labor, materials necessary to furnish and install the building complete per the contract drawings. The work specifically includes but is not necessarily limited to the building shell including foundation and footers. It also includes the concrete floor, walls, plumbing, electrical, HVAC, mechanical, lighting, and all other items indicated within the building as indicated in the Contract Drawings and in accordance with Appendix A - Technical Specifications.

Materials and Construction:

All materials and construction shall conform to the requirements of the Contract Drawings and in accordance with Appendix A - Technical Specifications.

Mandatory Pre-Bid Meeting:

All bidders must be represented at the Mandatory Pre-Bid Meeting(s) for this contract. The meeting information is provided on the first page of this contract (page i). The bidder's representative must sign-in and identify the name of the bidder they represent.

Failure to sign-in with the bidder's company name at the Mandatory Pre-Bid Meeting will result in the bidder being found non-responsible and non-responsive, and their bid will be rejected.

Method of Measurement:

Payment for this item will be made on a lump sum basis wherein no measurement will be made.

Basis of Payment:

Payment will be made at the Lump Sum price bid for this item. The price bid shall include the cost for performing the work specified and furnishing all labor, materials, tools, equipment and incidentals necessary to provide a complete, working and usable facility acceptable to the Engineer.

The breakout sheet attached to the proposal shows the proposed Bays for this Contract. The Contractor shall fill in a price per each location. The lump sum price bid for item 763569 - Buildings shall be the sum of the total cost for all buildings listed. The completed breakout sheet shall be attached to the bid proposal. Failure to submit the breakout sheet with the Bid Proposal will result in the Bid Proposal being declared non-responsive and rejected.

The Department reserves the right to delete from the Contract. The lump sum to be paid will be adjusted in accordance with the Contractor's unit prices as required above. There will be no extra compensation to the Contractor if such additions and/or deletion are made.

2/22/13

Contract #T200507303

UTILITY STATEMENT

STATE CONTRACT NO. T200507303
Project ID No.
F.A.P. No. NHS-S050(20)
Indian River Inlet Park Enhancements
Sussex County

The following companies maintain facilities within the contract limits:

Delmarva Power Delivery (Electric-Transmission)
Delmarva Power Delivery (Electric-Distribution)
Delmarva Power Delivery (Communications)
Verizon Delaware, Inc.
T-Mobile
MediaCom
Sussex County Engineering Department (Water & Sanitary Sewer)

The following is a breakdown of the utilities involved, adjustments and/or relocations as required (all stations, offsets, lengths and calendar days are approximate):

Delmarva Power Delivery (Electric-Transmission)

A. The Company maintains 69 kV three phase aerial electric transmission and fiber optic lines on Company owned poles along the westerly side of SR 1 (Coastal Highway) within the project limits with no apparent conflicts.

B. Any adjustments and/or relocations to the aforementioned Company's existing facilities will be done by the appropriate Company's forces as necessary during construction.

Delmarva Power Delivery (Electric-Distribution)

A. The Company maintains 25kV single and three phase aerial, underground and direct buried electrical distribution facilities within the project limits.

The Company will provide and install new services to the buildings including all incidentals required to complete the services within the project as shown on the plans and indicated in the special provisions. The Company will remove and abandon all Delmarva facilities as required and upon completion of the new facilities. The State's contractor will provide all pavement patches and traffic control as shown on the plans and indicated in the special provisions.

Company review of Field Changes:

The Company maintains the right to approve any design changes submitted by the Engineer as well as the right to review any field changes that could impact the construction of the electric manhole duct system.

Lead-Time for cable and associated materials (16-23 Weeks)

The lead time to procure these materials could possibly increase due to the economic situation and suppliers eliminating shifts.

NOTE: ESTIMATE DOES NOT INCLUDE COSTS FOR THE FOLLOWING:

REMOVAL/ BLASTING OF ROCK, CLEARING AND GRUBBING, REMOVAL OF SPOILS FROM SITE, SELECT TO BE PROVIDED BY DELDOT, RESTORATION COST NOT INCLUDED, REMOVAL AND DISPOSAL OF ANY CONTAMINATED DIRT OR WATER, MAINTAINING EXISTING U.G. & AERIAL FACILITIES DURING PROPOSED CONSTRUCTION

Delmarva Power will **require one hundred (100) calendar** days to complete the proposed work following twenty-eight (28) calendar days advance notice of completion of clearing and grubbing, cuts and fills made, staking of rights of way and completion of the Utility Pre-Construction Meeting for this contract and the procurement of easements by DelDOT and receipt of "**NTP**".

For exact location of electric facilities, please contact Miss Utility at (800) 282-8555.

16 Del. C. § 7405B ***requires notification to and mutually agreeable measures from the public utility from any person intending to carry on any function, activity, work or operation within dangerous proximity of any high voltage overhead lines. All contractors/other utilities must also maintain a distance of 10'-0" from all energized lines.***

Delmarva Power Delivery (Communications)

A. The Company maintains aerial, underground and/or buried facilities within the project limits with no apparent conflicts with the proposed construction activities.

B. Any adjustments and/or relocations to the aforementioned Company's existing facilities will be done by the appropriate Company's forces as necessary during construction.

Verizon-Delaware, Inc.

A. Verizon maintains underground, aerial and/or buried facilities within the limits of this project. The Company maintains both copper and fiber optic facilities.

B. The following is a breakdown of the facilities involved, and adjustments and/or relocations required (all stations, offsets, lengths, and calendar days are approximate):

The Company will provide new service connections to Buildings 1E, 1W and 2 and relocate an existing pedestal in the South Day Use parking lot. All other facilities within the project area are not anticipated to be in conflict or require relocation. Should any adjustments and/or relocations

to the aforementioned Company's existing facilities be required, beyond those described below, will be done by the appropriate Company's forces as necessary during construction.

1. **State's Contractor Responsibility:**

Furnish and installation of a new conduits to supply service for Buildings 1E, 1W and 2 as shown in the plans and specifications and as required by coordination with Verizon. The conduit system must be installed in accordance with the Company's standards and specifications and as directed by the Company's inspectors. Contractor will be responsible for furnishing all materials and incidentals associated with complete conduit installation.

2. **Verizon's Responsibility:**

The Company proposes to provide new service to Buildings 1E, 1W and 2 and abandon existing facilities as required. The Company will be responsible for insuring that the conduit system being constructed by the State's contractor is being built to the specifications and standards set by the Company. The Company will provide field inspection for quality assurance. The Company will be responsible for cabling, splicing, pedestal relocation, and all incidentals required to provide service to the proposed buildings. The Company will remove and abandon all Verizon facilities as required and upon completion of the new facilities.

The company will require 70 calendar days to complete the work.

T-Mobile

A. The Company maintains underground, aerial and/or buried facilities within the project limits with no apparent conflicts with the proposed construction activities.

B. Any adjustments and/or relocations to the aforementioned Company's existing facilities will be done by the appropriate Company's forces as necessary during construction.

MediaCom

A. The Company maintains underground, aerial and/or buried facilities within the project limits with no apparent conflicts with the proposed construction activities.

B. Any adjustments and/or relocations to the aforementioned Company's existing facilities will be done by the appropriate Company's forces as necessary during construction.

Sussex County Engineering Department (Water and Sanitary Sewer)

A. Any adjustments and/or relocations of the County's existing water or sanitary sewer facilities and installation of new facilities will be done by the State's Contractor in accordance with County's Standard Specifications and details, as indicated on the plans and outlined elsewhere in these Special Provisions.

Contract #T200507303

GENERAL NOTES:

1. THE UTILITIES AND THEIR CONTRACTORS DO NOT NORMALLY WORK ON WEEKENDS OR LEGAL HOLIDAYS!

2. IT IS UNDERSTOOD AND AGREED THAT THE STATE'S CONTRACTOR HAS CONSIDERED IN HIS BID ALL PERMANENT AND TEMPORARY UTILITY APPURTENANCES IN THEIR PRESENT OR RELOCATED POSITIONS AS SHOWN ON THE PLANS OR DESCRIBED IN THE UTILITY STATEMENT AND/OR ARE READILY DISCERNIBLE AND THAT NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR ANY DELAYS, INCONVENIENCE, OR DAMAGE SUSTAINED BY HIM/HER DUE TO ANY INTERFERENCE FROM THE SAID UTILITY FACILITIES AND APPURTENANCES OR THE OPERATION OF MOVING THEM, EXCEPT THAT THE STATE'S CONTRACTORS MAY BE GRANTED AN EQUITABLE EXTENSION OF TIME. THE STATE'S CONTRACTOR IS RESPONSIBLE FOR THE SUPPORT AND PROTECTION OF ALL UTILITIES WHEN EXCAVATING.

3. THE STATE'S CONTRACTOR IS RESPONSIBLE FOR ROUGH GRADING AS REQUIRED BY THE CONSTRUCTION PRIOR TO THE UTILITY COMPANY'S PLACING THEIR PROPOSED FACILITIES, UNLESS INDICATED ON THE PLANS AND/OR OUTLINED ELSEWHERE IN THESE SPECIFICATIONS.

4. THE UTILITY STATEMENT HAS BEEN PREPARED BASED UPON THE BEST AVAILABLE INFORMATION FOR RELOCATIONS AND NEW UTILITY FACILITIES. THE CONTRACTOR AGREES TO MAINTAIN ALL UTILITY FACILITIES LOCATED WITHIN THE LIMITS OF THE PROJECT'S CONSTRUCTION FOR THE DURATION OF THE PROJECT. SHOULD THE CONTRACTOR'S MEANS AND METHODS OF CONSTRUCTION REQUIRE THE TEMPORARY RELOCATION, SUPPORT/ PROTECTION OR TEMPORARY SERVICE OF A UTILITY, AS DEEMED NECESSARY BY THE UTILITY COMPANY, OR DAMAGE AN EXISTING UTILITY FACILITY IN ANY WAY, THE COST OF SUCH SHALL BE BORE BY THE CONTRACTOR; ADDITIONAL COMPENSATION OR TIME EXTENSIONS SHALL NOT BE GRANTED.

5. COORDINATION AND COOPERATION AMONG THE UTILITY COMPANIES AND THE STATE'S CONTRACTOR ARE OF PRIME IMPORTANCE. THEREFORE, THE CONTRACTOR IS DIRECTED TO CONTACT THE FOLLOWING UTILITY COMPANY REPRESENTATIVES WITH ANY QUESTIONS REGARDING THIS WORK PRIOR TO SUBMITTING BIDS AND WORK SCHEDULES. PROPOSED WORK SCHEDULES SHALL REFLECT THE UTILITY COMPANIES' PROPOSED WORK.

Mr. Ray Rouault	Delmarva Power Delivery (Electric-Transmission)	(302) 454-5174
Mr. Robert Weigner	Delmarva Power Delivery (Electric-Distribution)	(302) 934-3354
Mr. Bernie Fowler	Delmarva Power Delivery (Communications)	(302) 454-4239
Mr. Wayne Keller	Verizon-Delaware, Inc.	(302) 424-4350
Mr. Steve Wilcox	T-Mobile	(856) 803-6077
Mr. David Rickards	MediaCom	(302) 732-9332
Mr. Brad Hawkes	Sussex County (Water & Sewer)	(302) 855-7717

Contract #T200507303

PREPARED AND RECOMMENDED BY:

Carey Webb

Rummel, Klepper & Kahl, LLP
Consulting Engineers

2/21/13
Date

APPROVED AS TO FORM:

Joseph A Hoffer

Utilities Engineer, DelDOT

3/28/13
Date

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

CERTIFICATE OF RIGHT-OF-WAY STATUS

STATE PROJECT NO. T200507303

F.A.P. No. N/A for R/W

BRIDGE 3-156, INDIAN RIVER INLET PARK ENHANCEMENTS

SUSSEX COUNTY

Certificate of Right-of-Way Status – 100%

As required by 23CFR Part 635, all necessary right of way has been acquired in accordance with current State/Federal rules and regulations covering the acquisition of real property.

This is to certify that construction activities will occur within existing right-of-way.

Once locations are known, if there is any work in a municipality, a town agreement is needed. It is Traffic and/or the District's responsibility to notify Team Support for processing the agreement.

It is further certified that there were no occupant displacements caused by the project. Therefore the provisions of 49 CFR Part 24 is not applicable to the project.

REAL ESTATE SECTION

Robert Cunningham
Assistant Director Transportation Solutions
Right of Way

January 23, 2013

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

SHAILEN P. BHATT
SECRETARY

February 21, 2013

ENVIRONMENTAL REQUIREMENTS

FOR
State Contract No. T200507303
Federal Aid No.: NHS-S050(20)

Contract Title: BR 3-156, Indian River Inlet Park Enhancements

In accordance with the procedural provisions for implementing the National Environmental Policy Act of 1969, as amended, the referenced project has been processed through the Department's Environmental Review Procedures and has been classified as a Level D/ Class II Action.

Due to the nature of the proposed construction activities, permits are not required for this project. However, the following construction requirements and special provisions have been developed to minimize and mitigate impact to the surrounding environs. These requirements by DelDOT not specified within the contract, but listed below, are the responsibility of the contractor and is subject to risk of shut down at the contractor's expense if not followed.

GENERAL REQUIREMENTS:

1. All construction debris, excavated material, brush, rocks, and refuse incidental to such work shall be placed either on shore above the influence of flood waters or on some suitable dumping ground.

2. That effort shall be made to keep construction debris from entering adjacent waterways or wetlands. Any debris that enters those areas shall be removed immediately.

3. The disposal of trees, brush, and other debris in any stream corridor, wetland, surface water, or drainage area is prohibited.

DelDOT

BID PROPOSAL FORMS

CONTRACT T200507303.02

FEDERAL AID PROJECT NHS-050(20)

CANNOT BE USED FOR BIDDING

CONTRACT ID: T200507303.02 PROJECT(S): NHS-050(20)

All figures must be typewritten.

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
SECTION 0001 CIVIL SITE CONSTRUCTION						
0010	201000 CLEARING AND GRUBBING	LUMP	LUMP			
0020	202000 EXCAVATION AND EMBANKMENT	57480.000 CY				
0030	208000 EXCAVATION AND BACKFILLING FOR PIPE TRENCHES	132.000 CY				
0040	209002 BORROW, TYPE B	250.000 CY				
0050	210000 FURNISHING BORROW TYPE "C" FOR PIPE, UTILITY TRENCH, AND STRUCTURE BACKFILL	94.000 CY				
0060	211000 REMOVAL OF STRUCTURES AND OBSTRUCTIONS	LUMP	LUMP			
0070	251000 SILT FENCE	18700.000 LF				
0080	268000 STABILIZED CONSTRUCTION ENTRANCE	614.000 TON				
0090	302007 GRADED AGGREGATE BASE COURSE, TYPE B	16441.000 CY				

CANNOT BE USED FOR BIDDING

CONTRACT ID: T200507303.02 PROJECT(S): NHS-050(20)

All figures must be typewritten.

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS		UNIT PRICE DOLLARS	CTS	BID AMOUNT DOLLARS	CTS
0100	302008 GRADED AGGREGATE BASE COURSE, TYPE B, PATCHING	30.000	CY				
0110	302012 DELAWARE NO. 57 STONE	83.000	TON				
0120	302513 CRUSHED P.C.C. BASE COURSE	2341.000	CY				
0130	401510 POROUS FLEXIBLE PAVEMENT	6512.000	SF				
0140	401804 WMA, SUPERPAVE, TYPE C, 160 GYRATIONS PG 70-22 (CARBONATE STONE)	8428.000	TON				
0150	401813 WMA, SUPERPAVE, TYPE B, 160 GYRATIONS, PG 70-22	12758.000	TON				
0160	401821 WMA, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 64-22, PATCHING	15.000	TON				
0170	401822 WMA, SUPERPAVE, TYPE B, 160 GYRATIONS, PG 64-22, PATCHING	23.000	TON				
0180	501004 PORTLAND CEMENT CONCRETE PAVEMENT, 10"	267.000	SY				
0190	602510 CONCRETE CULVERT		LUMP	LUMP			

CANNOT BE USED FOR BIDDING

CONTRACT ID: T200507303.02 PROJECT(S): NHS-050(20)

All figures must be typewritten.

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS		UNIT PRICE DOLLARS	CTS	BID AMOUNT DOLLARS	CTS
0200	602512 REINFORCED CONCRETE WALL	470.000	LF				
0210	602615 MODULAR BLOCK RETAINING WALL	381.000	SF				
0220	602668 PORTLAND CEMENT CONCRETE STAIRS	780.000	SF				
0230	602772 MECHANICALLY STABILIZED EARTH WALLS	LUMP		LUMP			
0240	606510 HANDRAIL, TYPE I	2255.500	LF				
0250	612021 REINFORCED CONCRETE PIPE, 15", CLASS IV	259.000	LF				
0260	612022 REINFORCED CONCRETE PIPE, 18", CLASS IV	114.000	LF				
0270	612031 REINFORCED CONCRETE PIPE, 24", CLASS V	180.000	LF				
0280	612032 REINFORCED CONCRETE PIPE, 15", CLASS V	168.000	LF				
0290	612205 REINFORCED CONCRETE ELLIPTICAL PIPE, 19"X30", CLASS IV	8.000	LF				

CANNOT BE USED FOR BIDDING

CONTRACT ID: T200507303.02 PROJECT(S): NHS-050(20)

All figures must be typewritten.

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0300	614686 WATER SERVICE SYSTEM	LUMP	LUMP			
0310	617002 REINFORCED CONCRETE FLARED END SECTION, 15"	30.000 EACH				
0320	617003 REINFORCED CONCRETE FLARED END SECTION, 18"	4.000 EACH				
0330	617005 REINFORCED CONCRETE FLARED END SECTION, 24"	2.000 EACH				
0340	701011 PORTLAND CEMENT CONCRETE CURB, TYPE 2	364.000 LF				
0350	701014 PORTLAND CEMENT CONCRETE CURB, TYPE 1-6	7248.000 LF				
0360	701023 INTEGRAL PORTLAND CEMENT CONCRETE CURB & GUTTER, TYPE 3-6	142.000 LF				
0370	701026 PORTLAND CEMENT CONCRETE MONOLITHIC MEDIAN	252.000 LF				
0380	701505 P.C.C. PARKING BUMPER	381.000 EACH				
0390	705001 P.C.C. SIDEWALK, 4"	50485.000 SF				

CANNOT BE USED FOR BIDDING

CONTRACT ID: T200507303.02 PROJECT(S): NHS-050(20)

All figures must be typewritten.

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0400	705002 P.C.C. SIDEWALK, 6"	28638.000 SF				
0410	705007 SIDEWALK SURFACE DETECTABLE WARNING SYSTEM	364.000 SF				
0420	705533 P.C.C. SIDEWALK, SPECIAL I, 6"	31611.000 SF				
0430	705534 P.C.C. SIDEWALK, SPECIAL II, 6"	2617.000 SF				
0440	708107 MANHOLE, ROUND	2.000 EACH				
0450	708583 PERSONAL GRATE FOR PIPE INLET	1.000 EACH				
0460	710506 ADJUST AND REPAIR EXISTING SANITARY MANHOLE	16.000 EACH				
0470	710509 INSTALLING MANHOLE OVER EXISTING SANITARY SEWER	2.000 EACH				
0480	710510 CONNECTING SEWER TO EXISTING SANITARY MANHOLE	4.000 EACH				
0490	712005 RIPRAP, R-4	1534.000 SY				

CANNOT BE USED FOR BIDDING

CONTRACT ID: T200507303.02 PROJECT(S): NHS-050(20)

All figures must be typewritten.

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0500	713002 GEOTEXTILES, SEPARATION	72357.000 SY				
0510	713003 GEOTEXTILES, RIPRAP	1534.000 SY				
0520	720050 GALVANIZED STEEL BEAM GUARDRAIL, TYPE 1-31	288.000 LF				
0530	720556 BOLLARD	25.000 EACH				
0540	720585 GUARDRAIL END TREATMENT ATTENUATOR, TYPE 1-31	1.000 EACH				
0550	726001 END ANCHORAGE 31	1.000 EACH				
0560	727007 CHAIN-LINK FENCE, 8' HIGH	25.000 LF				
0570	727012 VEHICULAR GATES	4.000 EACH				
0580	727014 CONSTRUCTION SAFETY FENCE	2700.000 LF				
0590	727015 MONUMENTS	22.000 EACH				

CANNOT BE USED FOR BIDDING

CONTRACT ID: T200507303.02 PROJECT(S): NHS-050(20)

All figures must be typewritten.

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0600	727506 RELOCATING FENCE	589.000 LF				
0610	727510 WOOD RAIL FENCE	2362.000 LF				
0620	727519 RELOCATE CHAIN LINK FENCE	5390.000 LF				
0630	727521 VEHICULAR GATES, SPECIAL	1.000 EACH				
0640	727522 DECORATIVE FENCE	300.000 LF				
0650	732002 TOPSOIL, 6" DEPTH	25212.000 SY				
0660	734013 PERMANENT GRASS SEEDING, DRY GROUND	40351.000 SY				
0670	734508 TEMPORARY SEED MIX	6922.000 SY				
0680	734510 REFERTILIZATION OF PERMANENT SEED MIX	9.840 ACRE				
0690	734522 SEED MIX #1	20858.000 SY				
0700	734523 SEED MIX #2	6818.000 SY				

CANNOT BE USED FOR BIDDING

CONTRACT ID: T200507303.02 PROJECT(S): NHS-050(20)

All figures must be typewritten.

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0710	734524 SEED MIX #3	4170.000 SY				
0720	734525 SEED MIX #4	6604.000 SY				
0730	735535 SOIL RETENTION BLANKET MULCH, TYPE 5	21930.000 SY				
0740	737523 PLANTINGS	LUMP	LUMP			
0750	743000 MAINTENANCE OF TRAFFIC	LUMP	LUMP			
0760	743004 FURNISH AND MAINTAIN PORTABLE CHANGEABLE MESSAGE SIGN	33.000 EADY				
0770	743006 PLASTIC DRUMS	897.000 EADY				
0780	743008 REFLECTOR PANELS	4.000 EACH				
0790	743015 FURNISH AND MAINTAIN PORTABLE PCC SAFETY BARRIER	190.000 LF				
0800	743023 TEMPORARY BARRICADES, TYPE III	9166.000 LFDY				

CANNOT BE USED FOR BIDDING

CONTRACT ID: T200507303.02 PROJECT(S): NHS-050(20)

All figures must be typewritten.

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS		UNIT PRICE DOLLARS	CTS	BID AMOUNT DOLLARS	CTS
0810	743024 TEMPORARY WARNING SIGNS AND PLAQUES	9580.000	EADY				
0820	743058 FLAGGER, SUSSEX COUNTY, FEDERAL	688.000	HOUR	46.94000		32294.72	
0830	743067 FLAGGER, SUSSEX COUNTY, FEDERAL, OVERTIME	121.000	HOUR	68.06000		8235.26	
0840	743539 WOODEN SIGN POSTS, 4" X 6"	182.000	EACH				
0850	748001 PAINTING OF WHITE OR YELLOW, 4" LINE	24068.000	LF				
0860	748003 PAINTING OF WHITE OR YELLOW, SYMBOL/LEGEND	3270.000	SF				
0870	748015 PERMANENT PAVEMENT STRIPING, SYMBOL/LEGEND ALKYD-THERMOPLAST IC	1465.000	SF				
0880	748019 TEMPORARY MARKINGS, PAINT, 4"	2444.000	LF				
0890	748506 PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, 4"	7935.000	LF				
0900	748530 REMOVAL OF PAVEMENT STRIPING	80.000	SF				

CANNOT BE USED FOR BIDDING

CONTRACT ID: T200507303.02 PROJECT(S): NHS-050(20)

All figures must be typewritten.

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0910	749687 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE SIGN POST	99.000 EACH				
0920	749690 INSTALLATION OR REMOVAL OF TRAFFIC SIGNS ON MULTIPLE SIGN POSTS	262.000 SF				
0930	750000 ADJUST WATER VALVE BOXES	18.000 EACH				
0940	751000 ADJUST FIRE HYDRANTS	4.000 EACH				
0950	753516 SANITARY SEWER SYSTEM	LUMP	LUMP			
0960	758000 REMOVAL OF EXISTING PORTLAND CEMENTCONCRETE PAVEMENT, CURB, SIDEWALK, ETC.	685.000 SY				
0970	762001 SAW CUTTING, HOT MIX	817.000 LF				
0980	762002 SAW CUTTING, CONCRETE, FULL DEPTH	20.000 LF				
0990	763000 INITIAL EXPENSE	LUMP	LUMP			
1000	763501 CONSTRUCTION ENGINEERING	LUMP	LUMP			

CANNOT BE USED FOR BIDDING

CONTRACT ID: T200507303.02 PROJECT(S): NHS-050(20)

All figures must be typewritten.

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1010	763503 TRAINEE	1040.000 HOUR	0.80000		832.00	
1020	763508 PROJECT CONTROL SYSTEM DEVELOPMENT PLAN	LUMP	LUMP			
1030	763509 CPM SCHEDULE UPDATES AND/OR REVISED UPDATES	10.000 EAMO				
1040	763510 SITE FURNISHINGS	LUMP	LUMP			
1050	763512 ELECTRICAL SERVICE	LUMP	LUMP			
	SECTION 0001 TOTAL					

SECTION 0002 "SPECIALTY ITEM" BUILDING CONSTRUCTION

1060	763569 BUILDINGS	LUMP	LUMP			
	SECTION 0002 TOTAL					
	TOTAL BID					

CANNOT BE USED FOR BIDDING

BREAKOUT SHEETS

THE FOLLOWING SHEETS MUST BE COMPLETED AND RETURNED WITH THE PROPOSAL AT THE TIME OF BID. BREAKOUT SHEETS MUST BE COMPLETED REGARDLESS OF WHETHER BIDDING BY ELECTRONIC MEANS OR TYPEWRITTEN HARD COPY.

CANNOT BE USED FOR BIDDING

SECTION 1 **BREAKOUT SHEET - 1** **CONTRACT NO. T200507303**

ITEM 737523 -PLANTING

ITEM NO.	APPROX. QTY.	UOM	DESCRIPTION	UNIT PRICE	AMOUNT
1	58	EA	Juniperus virginiana (Eastern Red Cedar) 3-4' Ht.	$	$
2	45	EA	Pinus rigida (Pitch Pine) 4-5' Ht.	$	$
3	189	EA	Pinus tadea (Loblolly Pine) 5-6' Ht.	$	$
4	42	EA	Pinus virginiana (Virginia Pine) 4-5' Ht.	$	$
5	75	EA	Celtis occidentalis (Common Hackberry) 2" Cal, 8-10' Ht.	$	$
6	9	EA	Quercus phellos (Willow Oak) 2" Cal, 8-10' Ht.	$	$
7	73	EA	Quercus rubra (Red Oak) 2" Cal., 8-10' Ht.	$	$
8	18	EA	Platanus occidentalis (Sycamore) 2" Cal, 8-10' Ht.	$	$
9	20	EA	Ilex glabra (Inkberry) 18" Ht., #3 Gal.	$	$
10	237	EA	Myrica cerifera (Southern Bayberry) 30" Ht., #5 Gal	$	$

CANNOT BE USED FOR BIDDING

SECTION 1 **BREAKOUT SHEET - 1** **CONTRACT NO. T200507303**

ITEM 737523 -PLANTING

ITEM NO.	APPROX. QTY.	UOM	DESCRIPTION	UNIT PRICE	AMOUNT
11	186	EA	Myrica pensylvanica (Northern Bayberry) 30" Ht., #5 Gal	$	$
12	895	EA	Prunus maritima (Beach Plum) 18" Ht., #3 Gal	$	$
13	505	EA	Rhus copallinum (Winged Sumac) 18" Ht, #3 Gal	$	$
14	231	EA	Yucca filamentosa (Adam's Needle) 18" Ht, #3 Gal	$	$
15	741	EA	Opuntia humifusa (Prickly Pear Cactus) 1 Qt	$	$
16	12	EA	Panicum Virgatum (Switch Grass) 1 Qt.	$	$
17	3815	EA	Panicum amarum, (Coastal Panic Grass) Plugs	$	$
18	305	M/GAL	Watering (20 events over 2 years for all trees and shrubs)	$	$

TOTAL ITEM 737523 - PLANTING $_____
(LUMP SUM BID PRICE FOR ITEM 737523)

CANNOT BE USED FOR BIDDING

SECTION 1 **BREAKOUT SHEET - 2** **CONTRACT NO. T200507303**

ITEM 763510 -SITE FURNISHINGS

ITEM NO.	APPROX. QTY.	UOM	DESCRIPTION	UNIT PRICE	AMOUNT
1	9	EA	BENCH TYPE A	$	$
2	8	EA	BENCH TYPE B	$	$
3	4	EA	BENCH TYPE C	$	$
4	14	EA	4 UNIT BIKE RACK	$	$
5	3	EA	5 UNIT BIKE RACK	$	$
6	2	EA	KIOSK/DISPLAY CENTER	$	$
TOTAL ITEM 763510 - SITE FURNISHINGS $_____ (LUMP SUM BID PRICE FOR ITEM 763510)					

CANNOT BE USED FOR BIDDING

SECTION 1 **BREAKOUT SHEET - 3** **CONTRACT NO. T200507303**

ITEM 763512 - ELECTRICAL SERVICE SYSTEM

ITEM NO.	APPROX. QTY.	UOM	DESCRIPTION	UNIT PRICE	AMOUNT
1	EA	88	RV POWER POSTS	$	$
2	EA	7	TRANSFORMER PADS	$	$
3	EA	88	PROMENADE FIXTURES	$	$
4	EA	2	200A METER SOCKETS	$	$
5	EA	18	225A PANELBOARD	$	$
6	EA	8	400A METER SOCKET	$	$
7	EA	1	100A METER SOCKET	$	$
8	EA	3	125A PANELBOARDS	$	$
9	LF	10500	2"-80 PVC & BORROW	$	$
10	LF	21000	#1/0 WIRE	$	$

CANNOT BE USED FOR BIDDING

SECTION 1 **BREAKOUT SHEET - 3** **CONTRACT NO. T200507303**

ITEM 763512 - ELECTRICAL SERVICE SYSTEM

ITEM NO.	APPROX. QTY.	UOM	DESCRIPTION	UNIT PRICE	AMOUNT
11	10500	LF	#6 WIRE	$	$
12	1800	LF	#8 WIRE	$	$
13	6300	LF	1"-80 PVC & BORROW	$	$
14	1200	LF	#12 WIRE	$	$
15	18900	LF	#10 WIRE	$	$
16	1240	LF	4" - 80 PVC & BORROW	$	$
17	5	EA	STREET LIGHT POLE, 175 W FIXTURE AND FOUNDATION	$	$
18	700	LF	3"- 80 PVC	$	$
19	1490	EA	JB & CONDUIT FITTINGS	$	$
TOTAL ITEM 763512 - ELECTRICAL SERVICE SYSTEM $ _____ (LUMP SUM BID PRICE FOR ITEM 763512)					

CANNOT BE USED FOR BIDDING

SECTION 1 **BREAKOUT SHEET - 4** **CONTRACT NO. T200507303**

ITEM 763569 - BUILDINGS

ITEM NO.	APPROX. QTY.	UOM	DESCRIPTION	UNIT PRICE	AMOUNT
1	1	EA	1E - SE CONTACT STATION	$	$
2	1	EA	1W - SW CONTACT STATION	$	$
3	1	EA	2 - ADMIN CONTACT STATION	$	$
4	1	EA	3 - NORTH RV LAUNDRY	$	$
5	1	EA	4 - NORTH RV SHOWER	$	$
6	1	EA	5 - NORTH BATH HOUSE	$	$
7	1	EA	8 - SE BATH HOUSE RENOVATION	$	$
8	1	EA	9 - SW BATH HOUSE RENOVATION	$	$
9	1	EA	7A-16' PAVILION (NE PROMENADE)	$	$
10	1	EA	7B-16' PAVILION (NW PROMENADE)	$	$
11	1	EA	7C-16' PAVILION (SW PROMENADE)	$	$
12	1	EA	7D-16' PAVILION (SE PROMENADE)	$	$

TOTAL ITEM 763569 - BUILDINGS $_____
(LUMP SUM BID PRICE FOR ITEM 763569)

CANNOT BE USED FOR BIDDING

"ATTENTION"

TO BIDDERS

This Bid Proposal includes breakout sheets. The breakout sheets **MUST ACCOMPANY** the bid proposal at the time of bid.

CANNOT BE USED FOR BIDDING

CERTIFICATION

Contract No. T200507303.02
Federal Aid Project No. NHS-050(20)

The undersigned bidder, _____ whose address is _____
_____ and telephone number is _____hereby certifies the following:

I/We have carefully examined the location of the proposed work, the proposed plans and specifications, and will be bound, upon award of this contract by the Department of Transportation, to execute in accordance with such award, a contract with necessary surety bond, of which contract this proposal and said plans and specifications shall be a part, to provide all necessary machinery, tools, labor and other means of construction, and to do all the work and to furnish all the materials necessary to perform and complete the said contract within the time and as required in accordance with the requirements of the Department of Transportation, and at the unit prices for the various items as listed on the preceding pages.

Bidder's Certification Statement [US DOT Suspension and Debarment Regulation (49 CFR 29)]:

NOTICE: All contractors who hold prime contracts (Federal Aid) with DelDOT are advised that the prime contractor and subcontractors are required to submit to DelDOT a signed and notary attested copy of the Bidder Certification Statement for each and every subcontract that will be utilized by the prime contractor. This Certification **must** be filed with DelDOT prior to written approval being granted for each and every subcontractor. Copies of the Certification Form are available from the appropriate District Construction Office.

CANNOT BE USED FOR BIDDING

Under penalty of perjury under the laws of the United States, that I/We, or any person associated therewith in the capacity of (owner, partner, director, officer, principal, investigator, project director, manager, auditor, or any position involving the administration federal funds):

a. am/are not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any federal agency;
b. have not been suspended, debarred, voluntarily excluded or determined ineligible by any federal agency within the past 3 years;
c. do not have a proposed debarment pending; and,
d. have not been indicted, convicted, or had a civil judgement rendered against (it) by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

Exceptions will not necessarily result in denial of award, but will be considered in determining bidder responsibility. For any exception noted, indicate below to whom it applies, initiating agency, and dates of action. Providing false information may result in criminal prosection or administrative sanctions.

_____

_____

_____

(Insert Exceptions)

DBE Program Assurance:

NOTICE: In accordance with 49 CFR Part 26 the undersigned, a legally authorized representative of the bidder listed below, must complete this assurance.

By its signature affixed hereto, assures the Department that it will attain DBE participation as indicated:

Disadvantaged Business Enterprise _____ percent (blank to be filled in by bidder)

The foregoing quantities are considered to be approximate only and are given as the basis for comparison of bids. The Department of Transportation may increase or decrease the amount of any item or portion of the work as may be deemed necessary or expedient. Any such increase or decrease in the quantity

for any item will not be regarded as a sufficient ground for an increase or decrease in the unit prices, nor in the time allowed for the completion of the work, except as provided in the contract.

Accompanying this proposal is a surety bond or a security of the bidder assigned to the Department of Transportation, for at least ten (10) percentum of total amount of the proposal, which deposit is to be forfeited as liquidated damages in case this proposal is accepted, and the undersigned shall fail to execute a contract with necessary bond, when required, for the performance of said contract with the Department of Transportation, under the conditions of this proposal, within twenty (20) days after date of official notice of the award of the contract as provided in the requirement and specifications hereto attached; otherwise said deposit is to be returned to the undersigned.

I/We are licensed, or have initiated the license application as required by Section 2502, Chapter 25, Title 30, of the Delaware Code.

By submission of this proposal, each person signing on behalf of the bidder, certifies as to its own organization, under penalty of perjury, that to the best of each signer's knowledge and belief:

1. The prices in this proposal have been arrived at independently without collusion, consultation, communication, or Agreement with any other bidder or with any competitor for the purpose of restricting competition.
2. Unless required by law, the prices which have been quoted in this proposal have not been knowingly disclosed and will not knowingly be disclosed by the bidder, directly or indirectly, to any other bidder or competitor prior to the opening of proposals.
3. No attempt has been made or will be made by the bidder to induce any other person, partnership, or corporation to submit or not to submit a proposal for the purpose of restricting competition.

==========

I/We acknowledge receipt and incorporation of addenda to this proposal as follows:

No.	Date	No.	Date	No.	Date	No.	Date	No.	Date

BIDDERS MUST ACKNOWLEDGE RECEIPT OF ALL ADDENDA AND FINAL QUESTIONS AND ANSWERS.

MUST INSERT DATE OF FINAL QUESTIONS AND ANSWERS ON WEBSITE: _____

==========

Sealed and dated this _____ day of _____ in the year of our Lord two thousand _____ (20___).

_____
Name of Bidder (Organization)

Corporate Seal

By: _____
Authorized Signature

Attest _____

_____
Title

SWORN TO AND SUBSCRIBED BEFORE ME this ____ day of _____, 20____.

Notary Seal

_____
Notary

BID BOND

TO ACCOMPANY PROPOSAL
(Not necessary if security is used)

KNOW ALL MEN BY THESE PRESENTS That:_____

of_____ in the County of _____and State of _____as **Principal**, and _____ of _____ in the County of _____ and State of _____ as **Surety**, legally authorized to do business in the State of Delaware ("**State**"), are held and firmly unto the **State** in the sum of _____ _____Dollars ($_____), or _____ percent not to exceed _____ _____ Dollars ($_____) of amount of bid on Contract No._T200507303.02____, to be paid to the **State** for the use and benefit of its Department of Transportation ("**DelDOT**") for which payment well and truly to be made, we do bind ourselves, our and each of our heirs, executors, administrators, and successors, jointly and severally for and in the whole firmly by these presents.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH That if the above bounden **Principal** who has submitted to the **DelDOT** a certain proposal to enter into this contract for the furnishing of certain materiel and/or services within the **State**, shall be awarded this Contract, and if said **Principal** shall well and truly enter into and execute this Contract as may be required by the terms of this Contract and approved by the **DelDOT**, this Contract to be entered into within twenty days after the date of official notice of the award thereof in accordance with the terms of said proposal, then this obligation shall be void or else to be and remain in full force and virtue.

Sealed with _____ seal and dated this _____ day of _____ in the year of our Lord two thousand and _____ (20____).

CANNOT BE USED FOR BIDDING

SEALED, AND DELIVERED IN THE presence of

_____
Name of Bidder (Organization)

Corporate Seal

By: _____
Authorized Signature

Attest _____

_____
Title

_____
Name of **Surety**

Witness:_____

By: _____

_____
Title