

# STATE OF DELAWARE

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You must request a CD from  
DeIDOT in order to bid.



## DEPARTMENT OF TRANSPORTATION

### BID PROPOSAL

for

### CONTRACT T201307101.01

FEDERAL AID PROJECT NO. EBROS-N501(01)

BR 1-567A On N501 Hay Road over Shellpot Creek, City of Wilmington

NEW CASTLE COUNTY

ADVERTISEMENT DATE: September 12, 2016

**PROSPECTIVE BIDDERS ARE ADVISED THAT THERE WILL BE A PRE-BID MEETING MONDAY  
SEPTEMBER 26, 2016 AT 1:30 P.M. IN THE DeIDOT ADMINISTRATION BUILDING,  
800 BAY ROAD, DOVER, DELAWARE, 19903**

COMPLETION TIME: 247 Calendar Days

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

Bids will be received in the Bidder's Room at the Delaware Department of Transportation's Administration Building, 800 Bay Road, Dover, Delaware until 2:00 P.M. local time **October 18, 2016**

**Contract No. T201307101.01**  
**Federal Aid Project No. EBROS-N501(01)**

**BR 1-567A ON N501 HAY ROAD OVER SHELLPOT CREEK, CITY OF WILMINGTON**  
**NEW CASTLE COUNTY**

**GENERAL DESCRIPTION**

LOCATION

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

DESCRIPTION

The improvements consist of furnishing all labor and materials for this project, which involves the replacement of the existing single-lane functionally obsolete multi-span concrete girder bridge on timber piles. The proposed bridge will provide for two-way traffic and will be a multi-span concrete girder bridge on piles. Additional work will include the removal of the adjacent steel truss bridge, placement of riprap for scour protection, reconstruction of the approach roadway, installation of guardrail and other incidental construction in accordance with the location, notes and details shown on the plans and as directed by the Engineer.

COMPLETION TIME

All work on this contract must be complete within 247 Calendar Days. The Contract Time includes an allowance for 29 Weather Days. It is the Department's intent to issue a Notice to Proceed such that work starts on or about March 8, 2017.

PROSPECTIVE BIDDERS NOTES:

1. BIDDERS MUST BE REGISTERED with DelDOT and request a cd of the official plans and specifications in order to submit a bid. Contact DelDOT at [dot-ask@state.de.us](mailto:dot-ask@state.de.us), or (302) 760-2031.
2. QUESTIONS regarding this project are to be e-mailed to [dot-ask@state.de.us](mailto:dot-ask@state.de.us) no less than six business days prior to the bid opening date in order to receive a response. Please include T201307101.01 in the subject line. Responses to inquiries are posted on-line at <http://www.bids.delaware.gov>.
3. THE BID PROPOSAL incorporates a cd containing **Expedite, version 5.9a** and its installation file. Bidders are to use the cd provided to enter their bid amounts into the Expedite file. The Expedite bid file must be printed and submitted in paper form along with the cd and other required documents prior to the Bid due date and time.
4. SURETY BOND - Each proposal must be accompanied by a deposit of either surety bond or security for a sum equal to at least 10% of the bid.
5. **DRUG TESTING** - Regulation 4104; The state Office of Management and Budget has developed regulations that require Contractors and Subcontractors to implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds pursuant to 29 Del.C. §6908(a)(6). Refer to the full requirements by following the below link: <http://regulations.delaware.gov/register/september2015/final/19%20DE%20Reg%20207%2009-01-15.htm>  
Please note a few of the requirements listed below;
  - \* At bid submission - submit with the bid a signed affidavit certifying that the Contractor has in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for their Employees that complies with this regulation;
  - \* Upon DBE participation submission - submit a separate signed affidavit from each DBE Subcontractor certifying they have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for their Employees that complies with this regulation;
  - \* Two business days prior to contract execution - The awarded Contractor shall provide to DelDOT copies of the Employee Drug Testing Program for the Contractor and each participating DBE firm;
  - \* Subcontractors - Contractors that employ Subcontractors on the job site may do so only after submitting a copy of the Subcontractor's Employee Drug Testing Program along with the standard required subcontractor information. A Subcontractor shall not commence work until DelDOT has approved the subcontractor in writing;
  - \* Testing Report Forms shall be submitted to DelDOT monthly (forms will be provided).
  - \* Penalties for non-compliance are specified in the regulation.

6. Supplemental Specifications to the August 2001 Standard Specifications were issued November 24, 2014 and apply to this project. They can be [viewed here](#). The *Specifications Note* document is for the use by the bidders to reference the new numbers to the past numbers used for bidding purposes on previous Department contracts.
7. **PLEASE NOTE** federal requirements for the DBE program under [49CFR §26.53\(b\)\(3\)\(i\)\(B\)](#) have changed effective November 3, 2014. Submission of DBE participation information is now required from the lowest apparent bidder no later than seven (7) days after bid opening (*formerly 10 days*).
8. No RETAINAGE will be withheld on this contract.
9. The Department's External Complaint Procedure can be viewed on DelDOT's Website at; <http://www.deldot.gov/information/business/>, or you may request a copy by calling (302) 760-2555.
10. Prospective bidders are advised that there will be a **Pre-Bid Meeting** Monday September 26, 2016 at 1:30 p.m. in the DelDOT Administration Building, 800 Bay Road, Dover, Delaware, 19903. It is highly encouraged that interested bidders attend this Pre-Bid Meeting. The bidder's representative must sign-in and identify the name of the bidder they represent.
11. Contractor must add Calpine Mid-Atlantic Generation, LLC, and The Chemous Company FC, LLC, as "Additional Insured" to the Certificate of Liability Insurance and submit prior to contract execution.

Contract No.T201307101.01  
CONSTRUCTION ITEMS UNITS OF MEASURE

<b>English Code</b>	<b>English Description</b>	<b>Multiply By</b>	<b>Metric Code</b>	<b>Metric Description</b>	<b>Suggested CEC Metric Code</b>
ACRE	Acre	0.4047	ha	Hectare	HECTARE
BAG	Bag	N/A	Bag	Bag	BAG
C.F.	Cubic Foot	0.02832	m <sup>3</sup>	Cubic Meter	M3
C.Y.	Cubic Yard	0.7646	m <sup>3</sup>	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 <sup>3</sup>	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 <sup>2</sup>	Square Meter	M2
S.Y.	Square Yard	0.8361	m <sup>2</sup>	Square Meter	M2
SY-IN	Square Yard-Inch	0.8495	m <sup>2</sup> -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.

EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS:

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

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

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

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

TAX CLEARANCE:

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

SUBCONTRACTOR LICENSE: 29 DEL. C. §6967:

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

DIFFERING SITE CONDITIONS,

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

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

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

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

No contract adjustment will be allowed under their clause for any effects caused on unchanged work.

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

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

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

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

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

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

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

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

CONFLICT WITH FEDERAL STATUTES OR REGULATIONS:

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

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

FEDERAL LABOR AND EMPLOYMENT REQUIREMENTS

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

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

CONVICT PRODUCED MATERIALS:

- (a) Materials produced after July 1, 1991, by convict labor may only be incorporated in a Federal-aid highway construction project if such materials have been:
  - (1) Produced by convicts who are on parole, supervised release, or probation from a prison or
  - (2) Produced in a qualified prison facility and the cumulative annual production amount of such materials for use in Federal-aid highway construction does not exceed the amount of such materials produced in such facility for use in Federal-aid highway construction during the 12-month period ending July 1, 1987.
- (b) Qualified prison facility means any prison facility in which convicts, during the 12-month period ending July 1, 1987, produced materials for use in Federal-aid highway construction projects.

TO REPORT BID RIGGING ACTIVITIES:

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

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

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

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

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

Goals for Minority Participation In  
Each Trade

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

Goals for Female Participation In  
Each Trade

6.9% (Entire State)

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

The Contractor's compliance with the Executive Order and the 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 0. 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, Kiribati, 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 seven (7) 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 seven (7) 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.
8. In accordance with 49 CFR 26.53(f)(1), DelDOT requires that a prime contractor not terminate a DBE subcontractor without prior written consent from the DelDOT Civil Rights Office. This includes, but is not limited to, instances in which a prime contractor seeks to perform work originally designated for a DBE subcontractor with its own forces or those of an affiliate, a non-DBE firm, or with another DBE firm.

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#### GUIDANCE FOR GOOD FAITH EFFORT

When the DBE Goals established for a contract by 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.

\* \* \* \* \*

**CARGO PREFERENCE ACT (NEW)**

Requirements in the Federal-aid Highway Program

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

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

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

(b) Contractor and Subcontractor Clauses. "Use of United States-flag vessels: The contractor agrees—

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

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

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

NOTE:

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

\* \* \* \* \*

**BUY AMERICA (NEW)**

Requirements in the Federal-aid Highway Program

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

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

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

\* \* \* \* \*

## APPENDICES TO THE TITLE VI ASSURANCE

### APPENDIX A

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

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

**APPENDIX E**

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

**Pertinent Non-Discrimination Authorities:**

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

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

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

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

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

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

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

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

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

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

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

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

\* \* \* \* \*

### **PREVAILING WAGES**

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

#### **REQUIREMENT BY DEPARTMENT OF LABOR FOR SWORN PAYROLL INFORMATION**

Title 29 Del.C. §6960 stipulates;

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

(c) Every contract based upon these specifications shall contain a stipulation that sworn payroll information, as required by the Department of Labor, be furnished weekly. The Department of Labor shall keep and maintain the sworn payroll information for a period of 6 months from the last day of the work week covered by the payroll.

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

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

### **PREVAILING WAGE REQUIREMENTS**

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

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

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

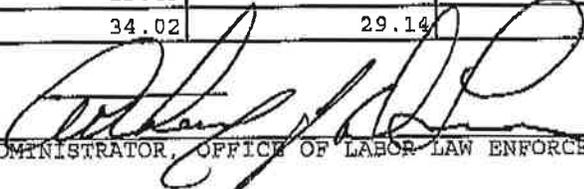
Mailing Address:  
225 CORPORATE BOULEVARD  
SUITE 104  
NEWARK, DE 19702

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

PREVAILING WAGES FOR HIGHWAY CONSTRUCTION EFFECTIVE MARCH 15, 2016

CLASSIFICATION	NEW CASTLE	KENT	SUSSEX
BRICKLAYERS	50.49	50.49	14.98
CARPENTERS	52.81	52.81	41.97
CEMENT FINISHERS	31.10	30.96	26.79
ELECTRICAL LINE WORKERS	23.23	44.82	21.94
ELECTRICIANS	65.10	65.10	65.10
IRON WORKERS	43.56	24.64	26.17
LABORERS	33.59	39.35	38.63
MILLWRIGHTS	16.63	16.14	13.93
PAINTERS	63.14	63.14	63.14
PILEDRIVERS	68.57	24.52	27.82
POWER EQUIPMENT OPERATORS	41.90	40.89	29.07
SHEET METAL WORKERS	23.49	20.97	18.99
TRUCK DRIVERS	34.02	29.14	35.50

CERTIFIED: 8/23/16

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 MECHANIC'S RATE.

PROJECT: T201307101.01 BR 1-567A on N501 Hay Road over Shellpot Creek, New Castle County

GENERAL DECISION: DE160020 06/17/2016 DE20

Superseded General Decision Number: DE20160020

State: DELAWARE

Construction Type: HIGHWAY

COUNTY: New Castle County in Delaware

HIGHWAY CONSTRUCTION PROJECTS

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.15 for calendar year 2016 applies to all contracts subject to the Davis-Bacon Act for which the solicitation was issued on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.15 (or the applicable wage rates listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2016. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at [www.dol.gov/whd/govcontracts](http://www.dol.gov/whd/govcontracts).

Modification Number	Publication Date	
0	06/17/2016	
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SUDE2016-002	04/23/2015	
	Rates	Fringes
Bricklayer	50.49	
Carpenter	52.81	
Cement Mason/Concrete Finisher	31.10	
ELECTRICIAN		
Electrician	65.10	
Line Worker	23.23	
Ironworker	43.56	
Laborer	33.59	
Millwright	16.63	
Painter	63.14	
Power Equipment Operator:		
Piledriver	68.57	
Power Equipment Operator	41.90	
Sheet Metal Worker	23.49	
Truck Driver	34.02	

-----  
WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.  
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Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR 5.5(a) (1) (ii)).

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

#### Union Rate Identifiers

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

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

#### Survey Rate Identifiers

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

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

#### Union Average Rate Identifiers

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

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

### WAGE DETERMINATION APPEALS PROCESS

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

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

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

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

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

**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

**NOTE:**

**PLEASE NOTE** revised Supplemental Specifications to the August 2001 Standard Specifications were issued November 24, 2014 and apply to this project. They can be [viewed here](#) and at [www.deldot.gov](http://www.deldot.gov).

**SPECIFICATIONS:** The Department is currently updating the August 2001 Specifications for Road and Bridge Construction. Through this update, some Divisions were renumbered and some new ones were created and added. The *Specifications Note* document is for the use by the bidders to reference the new numbers to the past numbers used for bidding purposes on previous Department contracts.

**401502 - ASPHALT CEMENT COST ADJUSTMENT**

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

The Delaware Posted Asphalt Cement Price will be issued monthly by the Department and will be the industry posted price for Asphalt Cement, F.O.B. Philadelphia, Pennsylvania. The link for the posting is [http://www.deldot.gov/information/business/bids/asphalt\\_cement\\_english.shtml](http://www.deldot.gov/information/business/bids/asphalt_cement_english.shtml).

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

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

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

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

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

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

The Asphalt cement cost adjustment will be calculated on grade PG 64-22 asphalt regardless of the actual grade of asphalt used. The Project Asphalt Cement Base Price per ton for the project will be the Delaware Posted Asphalt Cement Price in effect on the date of project advertisement.

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

**NOTE:**

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

5/05/15

**202505 – SETTLEMENT PLATFORM**

**Description:**

The work of this section includes furnishing, installing, protecting and maintaining settlement monitoring plates (SMP), pipe extensions, and platform settlement points conforming to the design and at the locations shown on the Plans or as directed by the Department. All labor, materials, equipment and incidentals necessary to complete this work shall be considered part of this item required to provide devices to observe ground movement during and after construction. The Contractor shall perform the monitoring, recording and reporting of the settlement.

**Submittals:**

1. Qualifying Experience

The Contractor shall submit proof of three or more projects of similar size and complexity on which the firm and personnel assigned to the project have successfully installed similar instrumentation within the last three years. The Contractor shall present the following information for each project listed as a reference at or prior to any preconstruction meetings:

1. Project Name, Location, Project Description, and Completion Date.
2. Surface and Subsurface Conditions.
3. Type and number of instruments installed.
4. Installation equipment and techniques utilized when applicable.
5. Provide names, current phone numbers, and current business addresses for the owner/designer, geotechnical consultant, and contract manager.
2. Settlement surveying and monitoring plan for review prior to construction. The plan shall identify the detailed location of settlement monitoring points, reference benchmarks, survey schedules and procedures and reporting formats.
3. Description of the surveying equipment to be used.
4. Settlement Plate Layout and Installation Details: Within two days after the installation of each settlement plate, the Contractor shall submit an installation record sheet including appropriate items from the following list.
  - i. Project name.
  - ii. Contract name and number.
  - iii. Settlement plate number.
  - iv. Material sizes and compositions.
  - v. Planned location in horizontal position and elevation.
  - vi. Planned orientation.
  - vii. Personnel responsible for installation.
  - viii. Date and time of start and completion.
  - ix. Weather conditions at the time of installation.
  - x. Notes of importance on the installation including problems encountered, delays, unusual features of the installation, and details of any events that may have a bearing on settlement plate behavior.

**Schedule for Settlement Platform Installations and Readings:**

The Contractor shall provide settlement monitoring plates, pipe extensions and platform settlement points to monitor settlement of new fill embankments. The Contractor shall make regular readings of the settlement as indicated on the plans.

Settlement monitoring plates shall be installed as shown on the plans. Settlement monitoring plates shall be located by repeatable survey (locations and elevations) and referenced to permanent benchmarks. Locations of benchmarks are to be determined by the Contractor and approved by the Engineer, and shall be located outside the zone of influence of the construction activity. Settlement monitoring plates shall be placed level and the risers shall be plumb.

The approximate locations of each instrument to be installed by the Contractor are shown on the project plans and include the following types: settlement plates and settlement platforms. Other locations may need to be added as directed by the Engineer.

#### Protection of Instrumentation and Repair of Damage

- a. The Contractor shall protect all instruments and appurtenant fixtures, leads, connections, and other components of instrumentation systems from damage due to construction operations.
- b. If an instrument is damaged or made inoperative due to the Contractor's operations or the operation of subcontractors under the direction of the Contractor, the Contractor shall notify the Engineer immediately. The Engineer will be the sole judge of whether repair or replacement is required. For each instrument that is abandoned for these reasons, the Contractor shall replace that instrument at no additional cost to the Department.
- c. Should any instrument become damaged or inoperative through no fault of the Contractor, the damaged or inoperative instrument shall be repaired or replaced at the contract unit prices for that instrument.
- d. The Engineer will advise the Contractor immediately upon discovery of damage to instruments as to the necessary schedule for replacement and the times of required access. Damaged instruments shall be repaired or replaced within 24 hours of initial damage. The Contractor's construction operations in the area of a damaged instrument(s) may be halted during repair or replacement of each damaged instrument at the request of the Department.

#### **Materials:**

##### Settlement Plates

- a. Settlement plates are sub-surface displacement reference platforms placed on the prepared ground surface prior to embankment fill placement. Risers are extended from the settlement plate as the fill is placed. A casing is placed around the riser for protection. Settlement plates are monitored by optical survey methods to determine vertical displacements occurring during and after embankment construction.
- b. The base plate shall be made from steel conforming to the requirements of ASTM A36. The riser pipe and outer casing shall be steel pipe conforming to the requirements of ASTM A53, Grade B, standard weight. The casing and the risers shall be as shown on the plan. The casing pipe shall have a minimum wall thickness of 0.375 inches. The riser pipe shall be galvanized and have a minimum wall thickness of 0.25 inches. Couplings, pipe caps, etc. shall conform to the requirements of ASTM A865. Threaded pipes shall be used for riser and casing pipe extensions.
- c. Sand shall conform to the requirements of ASTM C33.

#### **Construction Methods:**

1. Readings on the settlement platforms shall be performed by the Contractor. The Contractor is fully responsible for establishing benchmarks, submittals, and furnishing, installing and maintaining the settlement platforms.
2. The settlement platforms shall be installed at locations indicated on the plans or as directed by the Department.
3. The settlement plates shall be installed as indicated on the plans after all clearing and grubbing and topsoil removal has been completed. The sand base shall be tamped to provide a firm, level, and unyielding bearing surface for the base plate. The riser pipe shall be marked in 1-foot increments and labeled at 5-

foot increments to indicate the distances above the plate extending up through the embankment fill. Settlement plates shall be fabricated as shown on the plans.

4. The initial casing and riser pipes shall have a maximum length of 4 feet for each section. Spacers shall be provided between the riser pipe and the casing at a minimum of 4-foot intervals to ensure concentricity. The spacers shall not be directly attached to the riser pipe or otherwise installed that would impede the independent movement of the riser pipe.
5. As the height of fill above the settlement plate changes, the casing and riser pipes shall be increased or decreased in a maximum of 4-foot intervals to maintain the top of the riser pipe and casing above the embankment. As each additional length of pipe is added or removed, the pipe cap on the casing shall be immediately transferred to the top section on the settlement plate so as to prevent fill material from entering the casing. At other times, the cap shall only be removed to check settlement.
6. The casing pipe shall be marked by flags or other approved method to clearly show its location and to warn equipment operators and others of its location. The Contractor shall maintain the flags during the entire length of the Contract and replace those flags that are missing. At no time shall the settlement plate risers and casings extend higher than 5 feet above the ground surface elevation. Sections shall be added or removed as necessary during embankment construction to maintain the tops of the risers and casings at least 1-foot above the surface of the embankment.
7. The Contractor is responsible for maintaining the settlement plates in working order during the length of the Contract. Settlement Plates which are to be abandoned at the completion of the project shall have their riser pipes cut off two feet below roadway subgrade level and capped. If an instrument is damaged, moved, or disturbed due to causes other than settlement, the Contractor shall repair, reset, or replace the damaged instrument at no additional cost to the Department within three days after being damaged. The Engineer will be the sole judge of whether repair, resetting, or replacement is required. No additional fills shall be placed within fifty (50) feet of a damaged settlement platform until the damage has been corrected to the satisfaction of the Engineer. The Engineer may impose a work stoppage in the vicinity of the damaged instrument until it is again operational at no additional cost to the Department. Any repairs or replacements required will be at the Contractor's expense.
8. By the end of the first work day in each week, the Contractor shall submit to the Engineer a description of the work performed during the previous week. This description shall include at a minimum: a plan view location of the placed embankment, the volume of embankment placed, and in-situ density test results in accordance with Standard Specification sections 202 and 209.
9. The use of the settlement platforms for collecting data related to embankment foundation response will extend beyond the time of completion of the Contractor's embankment placement operations. The Contractor shall be responsible for assuring that all platforms are in working order until the time of completion of the Contract.
10. Instrumentation shall be read as indicated on the plans.
11. For vertical deformation monitoring, runs shall be performed by a single run beginning and ending on two different benchmarks installed in accordance with NGS standards. Settlement monitoring points shall be used as turning points or as intermediate foresights from two different turning points, allowing elevations to be adjusted and eliminating significant observational errors. The maximum length of line of sight shall be 150 feet, and the imbalance between backsight and foresight shall not exceed 30 feet. Allowable level loop misclosure shall not exceed  $\pm 0.033$  times the square root of M feet (where M is the distance of the level run in miles) for a single run between two benchmarks. A formal initial reading on a settlement monitoring point will consist of the average of three elevations, from three independent level runs, which meet the closure specified herein. Elevations established subsequent to a formal initial reading shall be determined by a single run as specified herein. The least count (without estimation) of the rod and level combination shall read to 0.003 foot or less, such that the accuracy of an elevation measurement shall be  $\pm 0.01$  foot (at 95 percent level of confidence).
12. Data shall be recorded in U.S. survey feet or inches.

13. Instruments used for vertical deformation monitoring shall have a minimum accuracy of plus or minus 0.005 of a foot (standard deviation for 3300 feet of double run leveling) and a minimum setting accuracy of plus or minus 1.0 arc seconds. Leveling rods shall be non-telescopic in design (i.e. "Chicago" style leveling rod). A bull's eye bubble shall be used to plumb the leveling rod. The use of fiberglass rods will need approval of Engineer prior to use.
14. All data recorded by the Contractor shall be of the following form:
  - a. Raw and reduced data shall be on summary tables in printed tabular format on 8-1/2 inch x 11 inch sheets of paper.
  - b. Reduced data for up to six like instruments that are located in the same geographical area shall be plotted on the same graphical plot. Each plot shall be submitted on an 8-1/2 inch x 11 inch sheet or 11 inch by 17 inch sheet.
  - c. Plots of deformation data at Settlement Monitoring Plates shall show absolute vertical deformation versus time with height or elevation of fill placed at time of reading. Plots of settlement plate data shall show absolute vertical deformation versus time and shall show the height or elevation of fill placed at the time of reading. Deformation plots shall also be provided in electronic data file format.
  - d. Survey data reports prepared by the Contractor shall be signed and sealed by either a Professional Engineer or Professional Land Surveyor licensed in the State of Delaware.

**Method of Measurement:**

The number of Settlement Platforms measured will be the actual number of platforms set in place and/or maintained as shown on the Plans or as directed by the Engineer. No measurement for payment will be made for pipe extensions.

**Basis of Payment:**

Settlement Platforms and will be paid for at the Contract unit price per Each, complete in place, which price shall be full compensation for all materials, tools, labor, and work incidental thereto including pipe extensions, steel plate, sand, couplings, spacers, welding, protection of the plate and pipe extensions during construction, all labor tools, equipment, and necessary incidentals to complete the work.

12/3/12

**202560 - CONTAMINATED MATERIAL**

**Description:**

Contaminated Material is defined as solids or liquids (including soil) potentially contaminated with a hazardous substance, requiring special handling and/or disposal per state or federal regulation.

This work describes the excavation, removal and treatment/disposal of contaminated materials resulting from project construction including utility and other types of excavation activities in accordance with the locations and notes on the Plans, and as directed by the Engineer or the Department's environmental representative. The Contractor will be notified of the Department's environmental representative at the pre-construction meeting.

**Overview of Costs:**

Potential contaminated solids may affect contractor's costs as follows;

Additional cost to normal excavation requirements:

- Cost of 8 mil plastic for placement under and over solid contaminated material,
- Maintaining the segregated contaminated solids staging area.

Reduced cost to normal excavation requirements:

- Not required to, or charged for, transport of contaminated material from site.
- Not required to, or charged for, disposal of contaminated soil.

Potential contaminated liquids will affect contractor's cost as follows;

Additional cost to normal excavation requirements:

- None

Reduced cost to normal excavation requirements:

- None

**Construction Methods and Responsibilities:**

Contractor's Responsibilities for potential contaminated solids:

The Contractor shall be responsible for providing the appropriate equipment and personnel necessary to excavate, stage, and load contaminated material for off-site disposal, as identified from previous site environmental investigations or identified during construction activities. The work will be performed in accordance with the procedures described in the site specific "Contaminated Material and Water Removal Work Plan" prepared by the Department's environmental representative. The Department will provide a copy of this plan after the project is awarded and before any work begins. The Contractor shall adhere to applicable Occupational Safety and Health standards, Guidelines and/or Laws. This will include compliance with 29 CFR Part 1910.

After award of the Contract, the Contractor shall immediately be responsible for notifying the Department's HAZMAT Program Manager's office (760-2463) for scheduling coordination with the environmental representative. The contractor shall submit a proposed schedule of work to the Department for review and approval prior to any commencement of work on this site. The Contractor is required to perform to a high standard of workmanship to assure protection of workers, local water supplies, and the environment. The Contractor shall coordinate with the utility companies prior to excavation. The Department's environmental representative shall be present during all phases of work associated with the excavation and removal of potentially contaminated material. Payment will not be made for any work done when a Department approved Inspector or environmental representative is not present to provide environmental oversight.

Specific tasks to be performed by the Contractor will include excavating soil per the project specifications. The Contractor will segregate "contaminated" soil as designated by the Department or their environmental representative, from "clean" soil and place the "contaminated" soil in a designated on-site staging area constructed by the Contractor. At a minimum the staging area needs to be lined with 8-mil plastic and a berm constructed to minimize storm water run-off. The "contaminated" soil will need to be covered by the Contractor at the end of each work day. The Contractor will be responsible for loading contaminated soil

onto trucks arranged by the Department's environmental representative on the days the contaminated soil is shipped off-site to a licensed disposal/treatment facility. The Contractor will backfill and compact the excavated area(s) according to the project specifications and payment will be made under that item of the Contract.

**Department's Responsibilities:**

The Department is responsible for providing and paying; the environmental representative; the transportation of contaminated material for disposal; and the disposal of contaminated material.

The "Contaminated Material and Water Removal Work Plan" will identify; the procedures to be used to excavate and stage the contaminated material; the licensed treatment/disposal facility where the Department will ship the contaminated material; the method the material will be transported to the treatment/disposal facility; and any additional health and safety requirements for site personnel.

The Department's environmental representative will conduct a health and safety briefing prior to commencement of activities on the sites to insure an understanding of all applicable standards, guidelines, laws, procedures, etc. consistent with the successful completion of this type of activity. The Department's environmental representative will conduct air monitoring during any excavation activities at the site to identify and mitigate fire, explosion and vapor hazards.

The Department's environmental representative shall coordinate the excavation activities with all applicable local, state, and federal environmental regulatory agencies. The Department's environmental representative will also oversee the excavation, removal and treatment/disposal of the material in the designated area(s) and perform such tests as field screening for soil contamination utilizing vapor monitoring techniques and collect soil samples for laboratory analysis to meet the requirements of the treatment/disposal facility, DNREC and/or the USEPA. The Department's environmental representative's personnel will subcontract with the disposal/treatment facility to provide transportation and disposal/treatment of all contaminated materials to be removed as part of the project. The Department's environmental representative is responsible for measuring the quantity of contaminated material removed, via certified scale weights, for the Department's records.

**Method of Measurement:**

The quantity of contaminated material will not be measured. It will be included in the excavation quantity.

**Basis of Payment:**

No additional payment will be made for the handling of contaminated material included in the excavation quantities. Contractor's costs for handling contaminated material as described herein are to be included in the standard excavation pay items included in this contract, and will constitute full compensation for excavation, constructing and maintaining the segregated soil staging area, placement of the contaminated soil in the staging area, providing plastic and daily covering of the segregated soil staging area, and loading of contaminated soil for removal by the Department.

This item is a contingency item and the Department reserves the right to delete from the Contract. The Contractor shall make no claims for additional compensation because of deletion of the item.

04/04/2014

**207500 - COFFERDAMS**

**Description:**

This work consists of furnishing all materials, designing and constructing temporary cofferdams in accordance with the notes on the Plans, this Special Provision and as directed by the Engineer.

**Materials:**

The type of temporary cofferdam to be constructed shall utilize a steel sheet pile design. Design and construction shall be in accordance with the applicable requirements of Section 207 of the Standard Specifications.

**Construction Methods:**

The Contractor shall submit to the Department for approval, design calculations, detailed layout, working drawings and construction methods, for cofferdam or for other diversion structure as shown on the Plans at least two weeks prior to initiating its construction. The entire submission shall be signed and sealed by a Professional Engineer registered in the State of Delaware prior to submitting to the Department.

**Basis of Payment:**

The quantity of cofferdams will be paid for at the Contract lump sum. Price and payment will constitute full compensation for furnishing and placing all materials, for design, submission of signed and sealed drawings, installation and removal of materials for cofferdam or any other device(s) used, any excavation in excess of that required for the structure as defined under Subsection 207.06 of the Standard Specifications, unless otherwise covered for payment on the Plans under a different Section, bailing, pumping and draining, sheeting, shoring, for all labor, equipment, tools and incidentals required to complete the work.

6/8/16

**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 in the 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 yd<sup>2</sup> (325 m<sup>2</sup>). 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

- 401800 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 115 GYRATIONS, PG 64-22  
(CARBONATE STONE)
- 401801 - BITUMINOUS CONCRETE, TYPE C, 160 GYRATIONS, PG 64-22 (CARBONATE  
STONE)
- 401802 - BITUMINOUS CONCRETE, TYPE C, 205 GYRATIONS, PG 64-22 (CARBONATE  
STONE)
  
- 401803 - BITUMINOUS CONCRETE, TYPE C, 115 GYRATIONS, PG 70-22 (CARBONATE  
STONE)
- 401804 - BITUMINOUS CONCRETE, TYPE C, 160 GYRATIONS, PG 70-22 (CARBONATE  
STONE)
- 401805 - BITUMINOUS CONCRETE, TYPE C, 205 GYRATIONS, PG 70-22 (CARBONATE  
STONE)
  
- 401806 - BITUMINOUS CONCRETE, TYPE C, 115 GYRATIONS, PG 76-22 (CARBONATE  
STONE)
- 401807 - BITUMINOUS CONCRETE, TYPE C, 160 GYRATIONS, PG 76-22 (CARBONATE  
STONE)
- 401808 - BITUMINOUS CONCRETE, TYPE C, 205 GYRATIONS, PG 76-22 (CARBONATE  
STONE)
  
- 401809 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE B, 115 GYRATIONS, PG 64-22
- 401810 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE B, 160 GYRATIONS, PG 64-22
- 401811 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE B, 205 GYRATIONS, PG 64-22
  
- 401812 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE B, 115 GYRATIONS, PG 70-22
- 401813 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE B, 160 GYRATIONS, PG 70-22
- 401814 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE B, 205 GYRATIONS, PG 70-22
  
- 401815 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE B, 115 GYRATIONS, PG 76-22
- 401816 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE B, 160 GYRATIONS, PG 76-22
- 401817 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE B, 205 GYRATIONS, PG 76-22
  
- 401818 - BITUMINOUS CONCRETE, SUPERPAVE, BITUMINOUS CONCRETE BASE  
COURSE, 115 GYRATIONS, PG 64-22
- 401819 - BITUMINOUS CONCRETE, SUPERPAVE, BITUMINOUS CONCRETE BASE  
COURSE, 160 GYRATIONS, PG 64-22
- 401820 - BITUMINOUS CONCRETE, SUPERPAVE, BITUMINOUS CONCRETE BASE  
COURSE, 205 GYRATIONS, PG 64-22
  
- 401821 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 64-22,  
PATCHING
- 401822 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE B, 160 GYRATIONS, PG 64-22,  
PATCHING
- 401823 - BITUMINOUS CONCRETE, SUPERPAVE, BITUMINOUS CONCRETE BASE  
COURSE, 160 GYRATIONS, PG 64-22, PATCHING
  
- 401824 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 160 GYRATIONS, PG-64-22,  
WEDGE
- 401825 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE B, 160 GYRATIONS, PG-64-22,  
WEDGE
  
- 401826 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 115 GYRATIONS, PG 64-22,  
(NON-CARBONATE STONE)
- 401827 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 64-22,  
(NON-CARBONATE STONE)
- 401828 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 205 GYRATIONS, PG 64-22,  
(NON-CARBONATE STONE)

**401829 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 115 GYRATIONS, PG 70-22,  
(NON-CARBONATE STONE)**

**401830 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 70-22,  
(NON-CARBONATE STONE)**

**401831 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 205 GYRATIONS, PG 70-22,  
(NON-CARBONATE STONE)**

**401832 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 115 GYRATIONS, PG 76-22,  
(NON-CARBONATE STONE)**

**401833 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 76-22,  
(NON-CARBONATE STONE)**

**401834 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 205 GYRATIONS, PG 76-22,  
(NON-CARBONATE STONE)**

**401835 - THIN BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 115 GYRATIONS, PG 64-22**

**401836 - THIN BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 64-22**

**401837 - THIN BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 115 GYRATIONS, PG 70-22**

**401838 - THIN BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 70-22**

**401839 - THIN BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 115 GYRATIONS, PG 76-22**

**401840 - THIN BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 76-22**

**.01 Description:**

This specification shall govern the production and construction of bituminous concrete pavement. 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.

Payment for bituminous concrete shall be in accordance with item 401699. 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. Payment adjustment factors will be calculated in accordance with the latest version of item 401699.

Bituminous concrete 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.

**.02 Materials:**

Use materials conforming to standard specifications 823.

Materials for bituminous concrete shall conform to the requirements of Subsections 823.01, 823.05-823.17, and 823.25 - 823.28 of the Standard Specifications and the following. 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.

a) **Asphalt Binder:**

Meet the requirements of Superpave performance-grade asphalt binder, as referenced in the Plans, according to M 320<sup>1</sup>, 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 <sup>1</sup>
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 Recycled materials used, the low temperature properties, per T 313, may be different than stated in M 320 or the previous table.

**b) Recycled Materials:**

**RAP (Recycled Asphalt Pavement):** Bituminous concrete pavement mechanically processed to a homogenous consistency to be recycled through the production plant for use in a new bituminous concrete mixture.

The percentage allowance of recycled materials (recycled asphalt pavement and/or shingles) 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.

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

**c) Shingles:**

**RAS (Recycled Asphalt Shingles):** Materials reclaimed from the shingle manufacturing process such as tabs, punch-outs, and damaged new shingles mechanically broken down with 100% passing the ½ in (12.5 mm) sieve. Shipping, handling, and shredding costs are incidental to the price of Superpave item.

Post-consumer shingles or used shingles are not acceptable. Fiberglass-backed and organic felt-backed shingles shall be kept separate. Both materials shall not be used in the same mixture at the same time. All shingles shall be free of all foreign material and moisture.

The use of Recycled Asphalt Shingles will be considered for 115 gyrations mix designs upon demonstration by the producer of adequate blending of the binder verified by laboratory testing on plant produced material.

**d) 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 <sup>1</sup> (% MIN)		FINE AGGREGATE ANGULARITY <sup>2</sup> (% MIN)		CLAY CONTENT <sup>3</sup> (% - MIN)	FLAT AND ELONGATED <sup>4</sup> (% - MAX)
	≤ 100 MM	> 100 MM	≤ 100 MM	> 100 MM		
< 0.3	55/-	-/-	-	-	40	-
0.3 to < 3	75/-	50/-	40	40	40	
3 to <10	85/80 <sup>5</sup>	60/-	45	40	45	
10 < 30	95/90	80/75	45	40	45	
≥30	100/100	100/100	45	45	50	10

<sup>1</sup>Coarse Aggregate Angularity is tested according to ASTM D5821.

<sup>2</sup>Fine Aggregate Angularity is tested according to AASHTO TP-33.

<sup>3</sup>Clay Content is tested according to AASHTO T176.

<sup>4</sup>Flat and Elongated is tested according to ASTM 4791 with a 5:1 aspect ratio.

<sup>5</sup> 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
<b>Toughness</b> , AASHTO T96 Percent Loss, Maximum	40
<b>Soundness</b> , AASHTO T104 Percent Loss, Maximum for five cycles	20
<b>Deleterious Materials</b> , AASHTO T112 Percent, Maximum	10
<b>Moisture Sensitivity</b> , AASHTO T283 Percent, Minimum	80

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, the polish value of the composite aggregate blend shall be greater than 8.0 when tested according to Maryland State Highway Administration MSMT 411 B ALaboratory Method of Predicting Frictional Resistance of Polished Aggregates and Pavement Surfaces.@ RAP shall be assigned a value of 5.0. The Contractor shall supply all polish values to the Engineer upon request.

e) **Mineral Filler:**

Conform to AASHTO M17.

f) **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.

Follow the manufacturer's recommendation for incorporating additives and WMA technologies into the mix. 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.

g) **Anti-stripping additives**

Conform to standard specifications Section 829 and blend with the asphalt cement in accordance with this specification. Incorporate anti-stripping additives when the Tensile Strength Ratio (TSR) as determined in accordance with AASHTO T283 is less than 80 or when specified for use by the Engineer.

**.03 Bituminous Concrete Production – Quality Control**

**(a) Process Control - Material Production Quality Control.**

Submit through 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 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 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.
- Load number of QC samples (1-10 if QA sample is not within trucks 1-10)
- Locations where samples will be obtained and the sampling techniques for each test
- 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 on working day as test results for each subplot 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 401644 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.

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 DeIDOT
- Failure to perform materials testing per their approved QC Plan
- Deviating from AASHTO or DeIDOT testing procedures.
- Use of any material or the use of a JMF component in a proportion that exceeds the allowable tolerance as specified in section 04(a)(1) of this specification not listed in the JMF.
- Use of the wrong PG graded asphalt.
- Failure to take corrective action per action points in the Contractors approved QC plan.

The following steps will be taken for violations listed above:

1. First offence: Written notice of violation to the Contractor
2. Second offence: Written notice of violation and forfeiture of any bonus (material production or pavement construction) payment eligibility under 401699 section .03 for that production shift.
3. Third offence: Written notice of violation, forfeiture of bonus payment eligibility, and a 5% deduction of payment based upon contract unit price in addition to any calculated pay adjustment factors per 401699 Section 03.
4. Fourth offence: Written notice of violation, forfeiture of bonus payment eligibility, 50% deduction of payment based upon contract unit price in addition to any calculated payment adjustment factor per 401699 Section 03, and immediate suspension of the Contractor until corrective actions are taken. Corrective actions shall be submitted in writing to the Engineer for approval. The Engineer may request a meeting with the Contractor to discuss proposed changes prior to lifting suspension.

Violations of Contractor QC plans shall be kept on record for a period of 1 year from the date of violation at the Central Lab.

**(b) Material Production Test Equipment.**

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.

Facilities for the use of the Engineer and inspectors shall be a minimum of 600 square feet of floor space conditioned to maintain constant temperature of 77F with two windows and a door equipped with functional locks and latches, located such that plant activities are plainly visible from one window of the building. Work space shall be furnished with illumination, tables, chairs, desks, telephone, and water including drinking water, sanitary facilities, fuel, and power necessary to conduct all necessary tests.

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 suspend production. In the case of an equipment malfunction, the Engineer may elect to test the material at another qualified testing laboratory while waiting for repairs to equipment.

Maintain minimum calibration records for the referenced equipment:

- SUPERPAVE<sup>R</sup> 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.

**(c) Material Production Test Methods**

- AASHTO T312 - Preparing and Determining the Density of Hot Mix Asphalt (HMA) Specimens by Means of the Superpave Gyratory Compactor
- AASHTO T166, Method C (Rapid Method) - Bulk Specific Gravity of Compacted Hot Mix Asphalt (HMA) Using Saturated Surface Dry Specimens
- AASHTO T308 - Determining the Asphalt Binder Content of Hot Mix Asphalt (HMA) by the Ignition Method
- AASHTO T30 - Mechanical Analysis of Extracted Aggregate
- AASHTO T209 - Theoretical Maximum Specific Gravity and Density of Hot Mix Asphalt (HMA)
- ASTM D7227 - Standard Practice for Rapid Drying of Compacted Asphalt Specimens using Vacuum Drying Apparatus

**.04 Job Mix Formula (JMF)**

**Mix Design.** Develop and submit a job mix formula for each mixture according to AASHTO R35. Each mix design shall be capable of being produced, placed, and compacted as specified. Assign a unique identification number to each JMF.

- a) Development of JMF

**Gradation:** Use the FHWA Superpave 0.45 Power Chart 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 bituminous concrete. Unless otherwise noted in the Plans, the Type C shall meet the 3/8" (9.5 mm) Nominal Maximum Aggregate Size. Type B bituminous concrete 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 AASHTO T11.

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 AASHTO T84 and AASHTO T85 and reported to three decimal places along with the specific gravity of the mineral filler to be used, tested according to AASHTO 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  $N_M$ . Height data provided by the SGC shall be employed to calculate volumetric properties at  $N_i$ ,  $N_D$ , and  $N_M$ .

**Superpave Gyratory Compactive (SGC) Effort:**

DESIGN TRAFFIC LEVEL (MILLION ESAL'S)	$N_{INITIAL}$	$N_{DESIGN}$	$N_{MAXIMUM}$
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 (%)
	$N_{INITIAL}$	$N_{DESIGN}$	$N_{MAX}$						
				25.0	19.0	9.5	12.5	4.75	
0.3 to < 3	≤ 90.5								65.0 - 78.0
3 to < 10									
10 < 30									
≥ 30	≤ 89.0	96.0	≤ 98.0	12.5	13.5	15.5	14.5	16.5	65.0 - 75.0 <sup>1</sup>

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 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.

**Gradation Control Points:**

The combined aggregates shall conform to the gradation requirement specified in the following table when tested according to T-11 and T-27.

TABLE 1

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

Note: The aggregate’s 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:**

Volumetric Property	Superpave Criteria
Air Voids ( $V_a$ ) at (%) $N_m$	2.0 (min)
Air Voids ( $V_a$ ) at $N_{design}$ (%)	6.0 (max)
Voids in Mineral Aggregate (VMA) at $N_{design}$	
25.0 mm Bituminous Concrete Base Course	-1.5
19.0 mm Type B Hot-Mix	+2.0
12.5 mm Type C Hot-Mix	
9.5 mm Type C Hot-Mix	
4.5 mm Type C Hot-Mix	

**The proposed JMF shall include the following:**

Submit for approval to the Engineer the following documentation on Pinepave mixture design software prior to starting production of a new mixture:

1. Job mix formula (JMF) design of the component materials and target characteristic values for each mixture proposed for use. 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 bituminous concrete meeting the specified properties. Recycled Asphalt Pavement (RAP) is one individual aggregate component regardless of fractionation size. Recycled Asphalt Shingles (RAS) is a separate component from RAP.

2. The JMF target characteristic values include the mixing temperature range, core temperature range for gyrations, 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.
3. Plot of the design aggregate structure on the FHWA Superpave 0.45 power chart showing the maximum density line and Superpave control points.
4. 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  $N_i$ ,  $N_d$ , and  $N_m$ .
5. Plot of the percent asphalt binder by total weight of the mix ( $P_b$ ) versus the following:  
  
    % of  $G_{mm}$  at  $N_d$ , VMA at  $N_d$ , VFA at  $N_d$ , Fines to effective asphalt binder ( $P_{be}$ ) ratio, and unit weight ( $\text{kg/m}^2$ ) at both  $N_d$  and  $N_m$ .
6. 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 AASHTO T209.
7. 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.  
  
    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.
8. Provide raw material of each JMF so NCAT Ignition Oven calibration correction numbers can be established for the Engineers and Contractors ovens. The Engineer shall provide an ignition oven correction number for each JMF.

#### **.05 Approval of JMF**

The Engineer will have up to three weeks once the JMF is submitted to review the submitted information.

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

##### **a) Design Evaluation:**

The Engineer may elect to evaluate the proposed JMF and suitability of all materials through laboratory trial batches. 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.

For more expeditious approval, the Contractor may undertake the following steps:

1. Submit the proper documentation on Pinepave mixture design software.
2. Produce the new mixture for a non-Department project. The Engineer will test the material, by taking three series per section 401800 03(c). The mixture will be approved by the Engineer for Department projects if the test results are within the specifications.

A new JMF is required when any of the following conditions occur:

- A change in the source of any of the aggregate component materials
- A change in the proportion of any aggregate component by more than 5.0%
- A change in the aggregate components resulting in a change in percent passing any sieve as identified in Table 1 by more than 5% of the JMF target.
- A change in the target AC content by more than 0.20% from the JMF target to maintain other Volumetric properties of the approved JMF.
- For any mixture that has a 20% or greater failure rate on any combined volumetric criteria.

Although a new JMF is not required, 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. This notification shall include the total change made from the approved JMF proportions, and the effective time of the change. The Engineer will reply to the proposed changes within one operational day and notify the Contractor of the effective date of the changes.

**.06 Construction.**

**(a) Pavement Construction Test Equipment.**

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

**Weather Limitations.**

Place mix only on dry, unfrozen surfaces and only when weather conditions allow for proper production, placement, handling, and compacting.

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

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

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

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

**Compaction:**

**(b) Pavement Construction - Process Control.**

Perform Quality Control of pavement compaction by testing in-place pavement density by the following methods.

- ASTM D2950 Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods; the use of other density gauges shall be as per the manufacturer's recommendations.
- AASHTO T166, Method C (Rapid Method) Bulk Specific Gravity of Compacted Hot Mix Asphalt (HMA) Using Saturated Surface Dry Specimens
- ASTM D7227 - Standard Practice for Rapid Drying of Compacted Asphalt Specimens using Vacuum Drying Apparatus

Cores may be cut on the first day of paving or once after the change of a JMF for gauge calibration. The number of cores obtained for calibration purposes shall not exceed the number of QA samples obtained by the Department for payment. The Contractor may use any method to select locations for the Quality Control calibration cores.

Repair all core holes in accordance with 401699 Appendix A.

**Method of Measurement:**

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

**Basis of Payment:**

All work completed under this item shall be considered for full payment and subsequently modified in accordance with the procedures enumerated under 401699.

Material production quality shall be evaluated per item 401699 - Quality Control/Quality Assurance of Bituminous Concrete .03 (a) Material Production - Tests and Evaluations.

Compaction quality shall be evaluated per Item 401699 - Quality Assurance of Bituminous Concrete .03 (b) Pavement Construction - Tests and Evaluations.

10/25/2013

**601520 - TEMPORARY TIMBER MAT**

**Description:**

The item shall consist of furnishing all materials and constructing a temporary timber mat for access across the wetland area as shown on the Plans and as directed by the Engineer. All equipment shall utilize this temporary timber mat when trying to access the stockpile/staging area and the underside of the bridge.

**Materials:**

In accordance with Section 601 of the Standard Specifications and the following:

Timber shall have a strength and grade adequate to support the Contractor's anticipated vehicular or equipment loads. Any preservative treatment applied to the matting shall be environmentally safe for wet conditions and be preapproved by the Department.

Hardware shall be in accordance with Section 601.07 of the Standard Specifications.

**Construction Methods:**

The Contractor shall submit to the Department for approval shop drawings and design calculations indicating the layout, size of members, arrangement of members and the construction methods at least two weeks prior to initiating construction. This information shall be signed and sealed by a Professional Engineer registered in the State of Delaware. A timber mat system is shown on the plans and shall be used for conceptual purposes only. The actual timber mat system utilized for the construction shall be designed for the anticipated construction loads and shall be compatible with the environment. Placement of stone within the wetland area is not permitted.

The temporary timber matting should be periodically inspected by the Contractor and any damaged or deteriorated components should be replaced. The Contractor assumes full responsibility for the load carrying capability of the system and for its anchorage, as required, to resist high water flows. No additional compensation will be granted for repairing any portion of the system damaged during naturally occurring weather events or contractor usage. The Contractor is responsible for retrieving lost mats and repairing any damage caused by naturally occurring weather events.

**Basis of Payment:**

The payment for the item shall be made for at the contract unit price bid per Lump Sum for "601520 - Temporary Timber Mat", which price and payment shall constitute full compensation for furnishing and placing all materials, for design, submission of signed and sealed drawings and computations, installation and removal of timber mat materials, and for all labor, equipment, tools and incidentals required to complete the work.

7/16/08

**602520 - EPOXY PROTECTIVE COATING FOR CONCRETE**

**Description:**

This work consists of preparing concrete surfaces and furnishing and applying an epoxy protective coating, in accordance with notes and details on the Plans, these specifications and directions from the Engineer.

**Materials:**

Scope. This Special Provision covers the material requirements of a two component, pigmented epoxy resin protective coating system used for the environmental protection of Portland cement concrete and other materials. This material should not be applied at temperatures above 95°F (35°C) or below 40°F (4°C).

General. The epoxy resin protective coating system shall be a two component, flexible, solvent-free, thermosetting system consisting of a modified epoxy resin, Component A, and a curing agent, Component B.

**Material Requirements:**

Characteristics of Component A. Component A shall be based on a high grade epoxy resin such as obtained from the condensation of Bisphenol A and Epichlorohydrin having the following characteristics:

Property	Specific Value		Test Method
	Min.	Max.	
Viscosity, CPS @24±1 Degrees C.	9,000	12,000	Brookfield Model RV No. 5/20 RPM ASTM D445
Weight per liter @24±1 Degrees C., kg.	1.45	----	----
Percent filler and pigment	----	40.0	By Ignition

Pigment filler shall be light-fast, durable and resistant to alkali.

Characteristics of Component B. Component B shall have the following characteristics:

Property	Specific Value		Test Method
	Min.	Max.	
Viscosity, CPS @ 24±1 Degrees C.	50	----	Brookfield Model RV No. 1/20 RPM ASTM D 445
Weight per liter @ 24±1 Degrees C, kg	0.8	----	----

Characteristics of the Mixture. The mixture of Components A & B shall have the following characteristics:

Property	Specific Value		Test Method
	Min.	Max.	
Viscosity, CPS @24±1 Degrees C.	----	10,000	Brookfield Model RV No. 5/20 RPM ASTM D 445
Pot Life, minutes @ 24±1 Degrees C.	30	----	----
Initial Cure, hrs. @24±1 Degrees C.	----	6	Tack-free to Touch
Shore D Hardness, @24±1 Degrees C. after 7 days	70/1	----	ASTM D 2240
Color-Off White	37722	37722	Federal Std. No. 595 A
Color Fastness	no appreciable change		High Intensity Ultra Violet Altas Weatherometer Model DMC-HRC

Package stability of each in original unopened container, in months, between 27 degrees Celsius and 0 degrees Celsius

12 ----

Packaging. All materials furnished must be shipped in strong, substantial containers. The containers shall be identified as "Part A -- contains epoxy resin," and "Part B -- contains curing agent," and shall be plainly marked with the following:

1. Delaware D.O.T. Specifications number.
2. Name of product.
3. Mixing proportions and instructions.
4. Name and address of the manufacturer.
5. Lot number and batch number.
6. Date of manufacture.
7. Quantity.
8. Date of expiration of acceptance.

Sampling. Material will be sampled and inspected at the place of manufacture or in warehouse lots as determined by the Department. Samples submitted to the Materials and Research Section will be taken as directed by the Department.

Tests.

Viscosity. - The viscosity of the mixture of components A & B shall be taken 20 minutes after the components are mixed within 15-20 seconds of the time the viscometer is started. This material shall then be used to fill the lid of a .09 gal (0.35 liter) ointment can approximately two-thirds full. This specimen shall be used to determine the tack-free time for initial cure requirement.

Initial Cure. The initial cure shall be considered that time at which a mixture of components A & B as prepared under viscosity above shall be tack-free to touch.

Pot Life. The pot life is determined as follows.

Samples of each resinous cement component are conditioned at 75°F (24±1°C). When the samples have reached 75°F (24±1°C), 2.1 oz. (60±0.4 g.) total of components A and B in the proportions recommended by the manufacturer are weighed into an unwaxed paper cup. The time is recorded and they are immediately mixed, stirring for three minutes with a wooden tongue depressor, taking care to periodically scrape the walls and bottom of the cup and the mixer. The sample is then poured into an .06 gal (0.24 liter) unwaxed paper cup, set on a bench top, and probed every two minutes with a small stick, starting twenty minutes from the time of mixing. The time at which a soft ball forms in the center of the container is recorded as the pot life. This specimen shall be retained and used for the determination of the Shore D hardness.

Shore D Hardness. The hardness test shall be performed on the specimen retained from Pot Life above.

Color Fastness. The test for color fastness of the cured epoxy shall be conducted as follows.

Cast two, 3 1/2" (89 mm) diameter buttons following the manufacturer's instructions for mixing the epoxy components. Allow each button to cure for 72±2 hours at laboratory temperature in a dark chamber away from sources of ultraviolet light. Designate one button as the color control button and retain it in the dark chamber. Subject the other button to 16 hours total exposure time (20 minute cycle) in the High Intensity Ultra Violet Weatherometer, Model DMC-HRC. Each cycle, continuously repeating, starts with 17 minutes of light followed by 3 minutes of light and water spray. Remove the test button and compare the color of the exposed area to Federal Standard 595A, color, and to the color of the control button. The color of the test button shall not differ appreciably from the color of the control button and the color, defined by Federal Standard 595A.

Basis of Acceptance. This material will be considered for acceptance in stock lot quantities at manufacturer of supply locations in accordance with procedural directives of the Materials and Research Section. The expiration date of acceptance of this material shall be twelve months after the date of manufacture. Any unauthorized tampering or breaking of the seals on the containers between the time of sampling and delivery to the jobsite will be cause for rejection of the material.

**Construction Methods:**

Preparation of Surfaces. New concrete surfaces shall be thoroughly cleaned before epoxy application. All laitance, curing membranes, paint, oil, grease, silicone, dust, asphalt and other substance which might prevent bond between the epoxy and the concrete shall be removed. The surface preparation shall be accomplished by waterblasting with sand added, sand blasting, or shot blasting, followed by high pressure, oil-free, air blasting.

The epoxy protective coating shall be applied as soon as practicable after cleaning is completed. If, in the opinion of the Engineer, the concrete surface has become soiled, or otherwise contaminated, prior to epoxy application, the surface shall be re-cleaned in accordance with the requirements of this subsection at no additional cost to the Owner.

Mixing. The two parts of the epoxy protective coating are furnished in separate containers. Each part of the coating shall be thoroughly stirred in its own container prior to mixing in order to disperse any settlement which may have occurred. The two parts of the epoxy protective coating shall be proportioned in strict accordance with the instructions on their containers and then thoroughly blended together. A paddle attached to a 1/2" (12 mm) electric drill with a rated speed not to exceed 550 rpm is recommended for mixing. For batches for less than 1 gal (4 liters), thorough hand stirring may be satisfactory. No diluent, solvent, thinner or other foreign material shall be added to either the individual components or the mixed epoxy protective coating.

Application. Materials shall be applied only when the air temperature is at least 40°F (4°C) and rising, but less than 95°F (35°C) and the surface temperature of the area to be coated is at least 40°F (4°C). Surfaces must be dry before application.

Epoxy placement may be allowed in suitably prepared, artificially heated enclosures. Artificial heat shall be applied at rates sufficient to ensure that the substance and air temperatures within the enclosure are, at all times, maintained between 40°F (4°C) and 95°F (35°C) inclusive. Artificial heat shall be supplied within the enclosure until the epoxy is cured to a tack-free condition, firm to hand pressure, and satisfactory to the Engineer.

The surface shall be coated in accordance with the manufacturer's recommendations. The finished coating shall be uniform in color and coverage.

Note: Under certain combinations of circumstances, the cured epoxy protective coating may develop an "oily" condition on the surface due to amine blush. This condition is not detrimental to the applied system.

Care shall be taken so that the entire surface of the concrete is covered and all pores filled. The Contractor shall use only one manufacturer's material on all surfaces visible from one location, in order to provide a uniform appearance.

**Method of Measurement:**

The quantity of epoxy protective coating will be measured as the actual number of square yards (square meters) of surface area covered with the epoxy protective coating, completed and accepted.

**Basis of Payment:**

The quantity of epoxy protective coating will be paid for at the Contract unit price per square yard (square meter). Price and payment will constitute full compensation for furnishing and placing all materials, and for all labor, equipment, tools, and incidentals, necessary to complete the work.

12/17/04

**602616 - WATERPROOFING P.C.C. MASONRY SURFACES**

**Description:**

This work shall consists of furnishing and installing a asphaltic waterproofing membrane on Portland cement concrete masonry vertical surfaces or horizontal surfaces that are not under traffic in accordance with these Special Provisions, notes and details on the Plans, and as directed by the Engineer.

**Materials:**

The waterproofing asphaltic membrane shall consist of a woven or non-woven; needle punched composite membrane of a minimum 60 mils thickness. Woven fiberglass reinforcement or non-woven, needle punched polypropylene shall be sandwiched between rubberized asphalt compound or adhesive membrane. The materials shall have sufficient adhesive property or applied with primer tack coat. The primer/ tack adhesive materials shall be compatible with asphaltic membrane and used as per recommendation of manufacturers.

**The materials shall have following physical properties:**

<u>Property</u>	<u>Test Method</u>	<u>Standard</u>
Strip Tensile	ASTM D 882	50 lbs/in min
Puncture Resistance	ASTM E 154	40 lbs min
Permeance	ASTM E 96 Method B	0.05 perms (max)
Fiability	ASTM D 146	No crack or split

**Construction Methods:**

The concrete surface preparation and installation of the membrane shall be done as described herein, notes on the Plans and/or as recommended by the manufacturer of the membrane. In case of any conflict between these Special Provisions and the manufacturer's recommendations, the latter will prevail.

All holes or voids in the concrete shall be patched with an approved non-shrinkable grout, and all sharp protrusions shall be removed. The surface shall be thoroughly cleaned of dirt, loose concrete and other contaminates. The cleanliness may require pressure wash or lightly shot blast. Prior to installing the membrane, primer shall be applied to the cleaned concrete surface. Puddles shall be brushed out and the primer allowed to dry to touch which normally takes a half hour.

The membrane shall be installed on the concrete at an ambient temperature of 50°F or higher or as per manufacturer recommendation. The membrane shall be applied by hand rolling the laminates onto the primed surface or by using approved mechanical aids. Primer can be applied by brush, squeegee or roller as thin as possible, avoid excess build up of adhesive and allow to dry completely prior to the application of membrane or by using approved mechanical aids. In either case, the release paper shall be removed as the installation of the membrane proceeds. The membrane shall cover the concrete surface with the sticky side down.

The membrane shall be rolled into close contact with the concrete surface with a carpet padded wooden float. The sealing of overlaps at the end of each roll shall be achieved by heating with a propane torch. All entrapped air bubbles shall be eliminated by puncturing the membrane and patching.

The membrane sheet should be overlapped at least 3” or as specified by manufacturer.

**Method of Measurement:**

The quantity of waterproofing membrane will be measured as the actual number of square feet completed and accepted.

**Basis of Payment:**

The quantity of waterproofing membrane will be paid for at the Contract unit price per square foot. Price and payment will constitute full compensation for surface preparation, furnishing and placing all materials including primer and membrane, equipment, tools, for all labor, and incidentals necessary to complete the work.

**602646 - SILICONE ACRYLIC CONCRETE SEALER**

**Description:**

This work consists of surface preparation, furnishing all materials, and application of a silicone acrylic concrete sealer to any concrete surface. The work shall be performed as indicated on the Plans, in accordance with these Specifications, and as directed by the Engineer.

**Materials:**

The concrete sealer shall consist of methyl methacrylate-ethyl acrylate copolymer resins and toning pigments suspended in solution of all times by a chemical suspension agent and solvent. Laminar silicates, titanium dioxides, and inorganic oxides may be used for toning pigments. Use of vegetable or marine oils, paraffin materials, stearates or organic pigments in the formulation shall not be permitted.

The Sealer shall be opaque, non-film forming, and penetrating silicone acrylic compound. The sealer shall pass NCHRP 244 Series-2, salt spray resistance requirements. The materials must be local OTC-VOC compliant.

The contractor shall provide Materials and Research Section one (1) quart sample from each batch of the silicone acrylic sealer compound supplied for chemical identification and testing.

The manufacturer shall supply a Materials Safety Data Sheet and a letter of certificate compliance of batch & lot of each shipment of the concrete sealer materials. The contractor shall also provide a manufacturer analysis report of the materials used with the specified batch shipped to the job site.

The color of the compound shall be off white (Federal Color #37925 of FED-STD-595B) or as specified on the plans.

**Surface Preparation:**

All new concrete surfaces, texturing, saw cutting, repointing and grooving shall be completed before the surface is prepared for sealer. All concrete that is to be sealed shall be cured for at least 28 days after casting or for the length of time specified in the manufacturer's instruction, which ever is longer. After 28 days, concrete surface shall be lightly sand or shot blasted, followed by vacuum cleaning in accordance with ASTM D 4258 & SSPC-SP-13 requirement to completely remove any applied curing compound, and to make surface lightly rough for penetration of sealer.

For existing concrete, all previous sealers and paints, all salt, efflorescence, laitance, and other foreign matter, and all loose material shall be completely removed using one or a combination of different preparation methods as specified in ASTM D-4258 and SSPC-SP 13.

In addition, both new and existing concrete shall receive a high pressure (3000-5000 psi) water washing at a flow of more than 4 gallons per minute, with zero degree of rotary nozzle. The contractor shall also allow the surface to dry for a minimum of 24 hours prior to the coating application after high-pressure washing. All surface preparation work shall be completed and approved by the Engineer before sealer the application can commence.

**Construction Methods:**

The sealer shall be used as supplied by the manufacturers without thinning or alteration unless specifically required in the manufacturer's instructions and verified by Engineer. The silicone acrylic concrete sealer shall be applied to all exposed concrete surfaces as shown on the plans.

Concrete curing compounds, form release agents, and concrete hardeners may not be compatible with recommended coatings. Check for compatibility by applying a test patch of the recommended coating system, covering at least 20 to 30 square feet.

The concrete sealer material shall be applied using coverage rate and equipment in accordance with the manufacturer's recommendations.

A minimum of two coats shall be applied; all applications shall be performed under dry conditions with application-spread rate as recommended by the manufacturers.

The sealer shall be applied within the ambient temperature range as recommended by the manufacturer, when no rain is expected within a minimum of 12 hours following the application, and there are no high winds that would cause an improper application. If rain has preceded the application, the surface shall be allowed to dry at least 24 hours before waterproofing application begins.

Follow manufacturers recommendation for coating thickness. No drips, runs, or sags will be allowed during application. Natural bristle brush, roller, or spray can be used to perform the application. Follow manufacturers recommendation during application. No thinning of materials is permitted; all application procedures, and drying time between coats must be as per manufacturers recommendations.

The Contractor shall perform surface preparation and application of the concrete sealer material so as not to endanger any private and/or public property, pedestrians, workmen, and vehicles on, beneath or adjacent to the structure.

**Method of Measurement:**

The quantity of "Silicone Acrylic Concrete Sealer" will be measured by the square feet of area treated and accepted.

**Basis of Payment:**

The quantity of "Silicone Acrylic Concrete Sealer" will be paid for at the Contract unit price per square foot. Price and payment will constitute full compensation for furnishing all materials, furnishing and removing scaffolding as required, surface preparation, application of the concrete sealer material, disposal of discarded materials, and for all labor, tools, equipment, and all necessary incidentals to complete the work.

2/1/07

**614505 - GAS LINE RELOCATION**

GENERAL DESCRIPTION: This work consists of furnishing and placing a landfill gas conveyance facility. This specification is divided into 4 parts:

1. PART 1 - HIGH DENSITY POLYETHYLENE (HDPE) PIPE & FITTINGS
2. PART 2 - PIPING SYSTEMS
3. PART 3 - PAINTING
4. PART 4 - MEASUREMENT AND PAYMENT

1.0 PART 1 - HIGH DENSITY POLYETHYLENE (HDPE) PIPE & FITTINGS

1.1 DESCRIPTION:

The Contractor shall furnish all labor, materials, equipment and any applicable testing data for the HDPE Pipe and Fittings as shown on the Plans, as specified, or as required under applicable pipeline regulations to achieve a fully functional leak free pipeline.

The pipe, fittings, and the installation of the pipeline shall meet the applicable requirements of the U. S. Department of Transportation, Pipeline Safety Regulations, Title 49, Code of Federal Regulations, Part 192, the Delaware Administrative Code Title 2, Part 2000, Subpart 2401 and the Delaware Administrative Code Title 26, Part 8000, Subpart 8001.

1.2 MATERIALS:

The publications listed below and their latest revisions form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only.

American Society for Testing and Materials (ASTM) Publications:

- A276-10 Stainless Steel Bars and Shapes
- D2513-11c Polyethylene (PE) Gas Pressure Pipe, Tubing and Fittings
- D3261-10a Polyethylene Plastic Pipe and Fitting Materials
- F714-10 Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter
- F2206-11 Fabricated Fittings of Butt-Fused Polyethylene (PE) Plastic Pipe, Fittings, Sheet Stock, Plate Stock or Block Stock
- F2619-11 High Density Polyethylene Line Pipe
- F2620-11e1 Heat Fusion Bonding of Polyethylene Pipe and Fittings

Steel Structures Painting Council (SSPC) or National Association of Corrosion Engineers (NACE) Publication:

Sand Blasting Grade Common Standards

1. HDPE Pipe and Fittings

- a) Pipe and fittings supplied shall be of equal HDPE material, which meets the requirements of this Specification.
- b) HDPE pipe shall have a DR of 11 unless otherwise specified. Fittings shall have a DR of 9 unless otherwise specified.
- c) Materials used for the manufacture of polyethylene pipe and fittings shall be PE3408/PE4710 -PE100 high-density polyethylene meeting cell classification 445576C per ASTM D3350; and shall be listed in PPI (Plastics Pipe Institute) TR-4 with standard grade HDB ratings of 1600 psi at 73°F and 1000 psi at HOT. The material shall also be listed in the same PPI document as a PE100 with a MRS (Minimum Required Strength) of 10 Mpa (1450 psi) at 20°C (68°F). Note: PE4710-PE100 materials are not yet recognized by 49 CFR Part 192. The pipe will be dual or triple marked (PE3408/PE4710 -PE100) as required to comply with 49 CFR Part 192.
- d) Pipes and fittings shall have a pipe category code in compliance with ASTM D2513. Pipe shall have a co-extruded longitudinal yellow stripe a minimum of 3 equal distances along the pipe circumference, or equal as approved by the Engineer. Stripes printed or hot-stamped on the pipe outside surface are not be acceptable.

- e) Pipe Identification: The following shall be continuously indent printed on the pipe or spaced at intervals not exceeding 5-feet:
  - 1) Name and/or trademark of the pipe manufacturer.
  - 2) Nominal pipe size and IPS or DIPS designation.
  - 3) Dimension ratio (DR).
  - 4) The letters PE followed by the polyethylene grade in accordance with ASTM D2513 followed by the hydrostatic design basis, e.g. PE3408/PE4710.
  - 5) Manufacturing standard reference, e.g., ASTM D-3350.
  - 6) A production code from which the date and place of manufacturer can be determined.
- f) The standard laying length of pipe shall be 50-feet and no shorter than 20-feet, unless required to make up the required distance to a fitting.
- g) Maximum Allowable Operating Pressure (MAOP) shall be 60 psi at 73 °F per section 192.121 in 49 CFR 192. Test pressure shall be 150% of the maximum operating pressure or 90 psi in accordance with section 192.513 in 49 CFR 192. Pipe and fittings shall be fully pressure rated to match each other.
- h) Pipe bends for 12" diameter pipe shall be large radius fittings made from pipe having the same specifications as the main pipe. Fittings shall have nominal bending angles of 11, 22, 45, and 90 degrees and maintain full pipe opening throughout the entire bend and having a minimum center line of curvature at least 3 times the pipe diameter. Mitered joint fittings are allowed with approval of Engineer.
- i) Fittings for pipe diameters less than 12" shall be factory molded and suitable for butt fusion unless otherwise specified. Fittings shall be pressure rated and comply with the same specifications as the pipe. Non-molded fittings may be used only when approved by Engineer for a specific location/application.

## 2. Fusion Couplings

- a) Sections of pipe shall be joined into continuous lengths in the work area above ground. The joining method shall be butt fusion and shall be performed in accordance with Manufacturer's recommendations. All field welds shall be made with fusion equipment with a data logger for temperature, pressure, and graph of fusion cycle, etc.
- b) Joining of HDPE pipe shall be by butt fusion or where circumstances warrant, couplings shall be by the electrofusion socket type connection that provides a welded connection. Electrofusion locations will require Engineer approval. Electrofusion couplings shall not be used unless approved by the Engineer and their location shall be field surveyed. The Contractor shall maintain records of the of the weld recording information similar to the form attached at the end of the Section.
- c) Socket fusion, hot gas fusion, threading, solvents and epoxies will not be used to join HDPE pipe and fittings. The only exception shall be electrofusion socket fittings which will be employed only upon approval of Engineer for a specific location.

## 3. Flanges

- a) Mechanical connections of the pipe to auxiliary equipment such as valves, pumps, manholes, tanks, etc. shall be through flanged connections, which shall consist of:
  - 1) A polyethylene flange that shall be thermally butt-fused to the stub end of the pipe.
  - 2) A stainless steel back up ring with mating stainless steel flange or flanged fitting.
  - 3) Stainless steel bolts and nuts shall be used to connect the flanges.
  - 4) Flange connections shall be provided with a full-face neoprene gasket.
- b) Flanges shall be ANSI B16.1, Class 150 for all flange connections. Backup rings shall be stainless steel. Flanges shall have a full-face gasket.
- c) Bolting of Flanges: Material used for connecting flanges with bolts and studs shall be stainless steel conforming to ASTM A276, Type 304, and material for nuts shall be stainless steel conforming to ASTM A276, Type 304. Dimensions of bolts, studs, and nuts shall conform to ANSI B18.2.1 and ANSI B18.2.2 with threads conforming to ANSI B1.1 coarse type with Class 2A fit for bolts and studs, and Class 2B fit for nuts. Bolts or studs shall extend through the nuts and may have reduced shanks of a diameter not less than the diameter at root of threads. Stainless steel bolts shall have American Standard regular square or heavy hexagon heads and shall have American Standard heavy, semi-finished hexagonal nuts.

#### 4. Pipe Markers

- a) Trace/Locator Wire: Tracer/ Locator Wire shall be an electrically detectable solid wire conductor with bright yellow colored plastic covering. Wire shall be insulated with high molecular weight polyethylene (HMWPE) specifically for use in direct burial applications. Conductors shall be a 10 gauge single copper hard conductor complying with UL83 and ASTM requirements and having a breaking strength exceeding 800 pounds. The conductor shall be insulated with HMWPE minimum thickness at any point shall not be less than 90% of the specified average thickness in compliance with UL 83. Wire shall be marked at a minimum with "Tracer Wire", conductor size, and UL conformance requirements. Use water and soil resistant wire splices from same vendor that provides the wire.
- b) Aboveground Pipe Markers: As detailed on the Plans.
- c) Pipe Locator Test Stations: As detailed on the Plans.

#### 1.3 SUBMITTALS

- a) The Contractor shall submit to the Engineer for approval, manufacturing testing data for pipe and fittings which he proposes to use.
- b) The Contractor shall submit to the Engineer for approval, manufacturer's certifications for personnel that will fusion weld the pipe and fittings along with dates and duration of employment.
- c) The Contractor shall submit technical data and manufacturer information for the aboveground pipe markers, pipe locator test stations, and pipe fittings proposed for use on this project for Engineer and Owner approval.
- d) The Contractor shall submit certifications for personnel that will install and weld pipe and fittings in the field.
- e) The Contractor must submit a plan for pipe testing to the Engineer for review at least 10 days before starting to test.
- f) Deviations: If Contractor submits any materials that do not meet the requirements of this Specification and the Plans the Contractor shall provide a written description the materials including the deviations with data that show the magnitude of the deviations and the justification for the deviation. The decision to accept material deviating from this Specification and the Plans shall be the responsibility of the Engineer. The Engineer or Owner may request certified lab data to verify the physical properties of materials not meeting the requirements of the Specifications and Plans.
- g) Contractor shall provide the Survey Record as-builts to Engineer for review and approval as a Submittal in red-line hard copy format and electronic AutoCAD format.
- h) The Contractor shall submit warranty documentation from the Manufacturer for the pipe, fittings and appurtenances including the spare parts.

#### 1.4 CONSTRUCTION METHODS:

##### 1. Manufacturer

- a) The manufacturer shall have manufacturing and quality control facilities that are capable of producing and assuring the quality of the pipe and fittings required by these Specifications and the Plans. The Manufacturer's production facilities shall be open for inspection by the Owner or an Owner's Authorized Representative. The pipe and fitting Manufacturer shall be ISO Certified in accordance with the current edition of ISO 9001 and a documented quality management system shall be implemented that defines product specifications, manufacturing processes, and quality assurance procedures that assure conformance with Owner and applicable regulatory requirements. Upon request, the Manufacturer shall provide a current Certificate of Compliance from an independent ISO 9000 Registrar to the Owner. The Engineer reserves the right to perform a visit of the manufacturing facility that is proposed to produce the pipe and fittings as specified in this Specification and the Plans and that said visit shall constitute one part of Engineer's acceptance of manufacture's qualifications.

##### 2. Installer

- a) The Installer shall be a Contractor specializing in performing the installation work of pipe and fittings of this Specification and the Plans. The Installer shall have a minimum three (3) years documented experience working with HDPE pipe and fittings. The work of this Specification involves a regulated pipeline and the Installer shall provide documentation that allows the Owner or the Owner's Representative to demonstrate conformance with the requirements of Title 49 Code of Federal Regulations (CFR) Part 192 and Part 199. Such documentation shall include at a minimum:

- 1) Employee drug and alcohol testing and enforcement program.
- 2) Minimum of two (2) persons who maintain HDPE welder certifications (provide certificates) that are no more than twelve (12) months old from a recognized agency approved to test and issue welder certifications.
- 3) Minimum of two (2) persons who have passed applicable construction and installation training certifications from a recognized agency whom will be on-site during the construction and installation of the pipe and fittings.
- 4) Certificates of testing for the gauges on the pipe welding equipment that are no more than two (2) years old.
- 5) Certificates of testing the pipe pressure gage that is no more than ninety (90) days old from date when the final pipe pressure test is initiated.

### 3. HDPE Manufacturer's Quality Control

- a) Manufacturer's Quality Control: The pipe and fitting manufacturer shall have an established quality control program responsible for inspecting incoming and outgoing materials.
- b) Incoming raw materials for HDPE shall be inspected by the manufacturer for density, melt flow rate, and contamination. The supplier shall certify the cell classification properties of incoming material. Incoming materials shall be approved by Quality Control before processing into finished goods.
- c) Finished Product Evaluation: The manufacturer shall check and verify all outgoing HDPE materials and products produced for cosmetic defects (grooves, pits, hollows, etc.), outside diameter, wall thickness around circumference at both ends of pipe, roundness, concentricity, toe-in, pipe length, inside and outside surface finish, pipe markings for accuracy, and pipe ends to ensure they are cut square and clean. Quality Control shall verify production checks, and test for density, melt flow rate, hoop tensile strength and ductility. X-ray inspection procedures shall be used to inspect molded fittings for voids, and knit line strength shall be tested. Representative tests to verify long-term performance shall include slow crack growth, pipe inside surface ductility, and ambient and elevated temperature sustained pressure testing.
- d) The results of all measurements shall be recorded on production sheets, which become part of the manufacturer's permanent records, which shall be provided upon request to the Owner and Engineer.
- e) Compliance Tests: The manufacturer shall certify the inspection and testing of the materials and products. In case of conflict with manufacturer's certifications, the Installer, Contractor, Engineer, or Owner may request retesting by the Manufacturer or have retests performed by an outside testing service. All retesting shall be at the requestor's expense, and shall be performed in accordance with the Specifications and Plans.

### 4. Delivery, Handling, Storage, Relocation and Cleaning

a) The Contractor will assume responsibility for the pipe and fittings at time of delivery and during handling, storage and relocation. Any pipe sidewall damage greater than 10% of the pipe wall thickness will be rejected, regardless of its location. The damaged portion of pipe will be removed for a distance of at least one pipe diameter each side of damage prior to proceeding. Pipe will be rejoined at undamaged locations using butt welds.

b) Pipe Delivery: Contractor shall furnish all labor when pipe and fittings are delivered to the project to ensure the product is received and remains in an undamaged condition and that meet the requirements of this Specification. The Engineer and Owner reserve the right to reject pipe and fittings that appear to be of used condition, that are damaged and that do not meet the requirements of this Specification.

c) Pipe Handling Including Off-Loading: Pipe and fittings shall be handled in a safe manner that avoids damage to the product. When lifting with slings, only wide fabric choker slings capable of safely carrying the load, shall be used to lift, move, or lower pipe and fittings. Nylon, fabric or rubber protected slings and straps shall be used by the Contractor. Slings shall be of sufficient capacity for the load and shall be inspected before use. Two (2) slings spread apart shall be used for lifting each length of pipe. Worn or damaged equipment shall not be used. Chains, cables, hooks or wire rope shall not be used.

d) Pipe Storage: Pipe and fittings shall be stored on clean, level and dry ground to prevent undue scratching or gouging of the pipe or fittings. Stacking of the polyethylene pipe shall be limited to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature conditions. Where necessary due to ground conditions, the pipe shall be stored on wooden sleepers, spaced suitably and of such width as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.

- e) When pipe laying is not in progress, including lunchtime, the open ends of the pipe shall be closed by fabricated plugs, or by other approved means.
- f) Pipe Relocation: Pipe and fittings shall be relocated or moved from storage to the work area including the installation trench in a safe manner that avoids damage to the product. Pipe shall be lifted and positioned as near to its final location prior to butt fusion welding. Welded pipe may be lifted on one end and dragged into position for short distances over surfaces that will not gouge the pipe surface more than minor scratching. Any other pipe relocation shall employ pipe support rollers. The pipe shall not be dropped into the trench.
- g) When lifting with slings, only wide fabric choker slings capable of safely carrying the load, shall be used to lift, move, or lower pipe and fittings. Nylon, fabric or rubber protected slings and straps shall be used by the Contractor. Slings shall be of sufficient capacity for the load and shall be inspected before use. Two (2) slings spread apart shall be used for lifting each length of pipe. Worn or damaged equipment shall not be used. Chains, cables, hooks or wire rope shall not be used.
- h) Pipe Cleaning: All pipe and fittings shall be thoroughly cleaned before installation, shall be kept clean until they are used in the work. Contractor shall use cleaning chemicals which are approved by HDPE pipe manufacturer.

#### 5. Compatibility

- a) Contractor is responsible for compatibility between pipe materials, fittings and appurtenances.

#### 6. Licenses and Permits

- a) All construction work related to the installation of HDPE pipe and fittings shall be performed by a licensed and bonded General Contractor. Permits and licenses must be obtained prior to construction.

#### 7. Warranty & Acceptance

- a) The manufacturer shall provide the manufacturer's warranty against manufacturing defects of pipe and fitting material and workmanship for a period of 20 years after the final acceptance of the project by the Engineer and Owner. The Contractor shall replace at no expense to the Owner any defective pipe and fitting material including labor within the first year of the warranty period. Spare parts shall have the same warranty period. The Engineer shall determine the need for warranty repair work to be performed by the Contractor. The Engineer's determination of a deficiency will bind the Contractor to make a repair in accordance with this Contract.
- b) Acceptance: If work has been done to the requirements of this Specification and Plans, a letter of acceptance shall be provided by Engineer to the Contractor upon final inspection.

#### 8. Quality Assurance

- a) Delivery: Pipe will be inspected upon delivery, and materials that do not comply with the Specification and Plans will be rejected by the Engineer. The Contractor will assume responsibility for the pipe during delivery, off-loading, storage, and handling. The Contractor shall furnish all labor required to handle the pipe during inspection and shall remove the rejected materials from the site of the work.
- b) Pipe Damage: Any pipe sidewall damage greater than 10% of the pipe wall thickness will be rejected, regardless of its location. The damaged portion of pipe will be removed for a distance of at least one pipe diameter each side of damage prior to proceeding. Pipe will be rejoined at undamaged locations using butt welds.
- c) If a damaged or defective pipe is discovered after it has been installed, it shall be removed and replaced with a sound pipe in a satisfactory manner at no additional increase in Contract value.

#### 9. Operator Qualifications

- a) Contractor is advised that construction of this pipe must be compliant with 49CFR 192 and related regulations as maintained by the Federal Department of Transportation (D.O.T.), more specifically, the US D.O.T. Pipeline and Hazardous Materials Safety Administration (PHMSA). The Delaware Public Service Commission (PSC) will have co-jurisdictional authority during construction and operation of the pipeline.
- b) D.O.T. Regulations require that each joint in a gas piping system must be made in accordance with written procedures that have been proved by test or experience to produce strong gastight joints (49CFR, Part 192, §192.273(b)).

- c) D.O.T. Regulations require that written procedures for butt fusion, saddle fusion, and socket fusion joining of polyethylene gas piping must be qualified before use by subjecting specimen joints to required test procedures (CFR 49, Part 192, §192.283(a)). The pipe manufacturer may have a written plan that can be submitted to Engineer as evidence of compliance with D.O.T. Regulations.
- d) D.O.T. Regulations require that all persons who make joints in polyethylene gas piping must be qualified under the operator's written procedures (CFR 49, Part 192, & §192.285(a)). Contractor shall have at least one qualified pipe welder on site at times that pipe is being butt welded. Submit copies of HDPE welding certifications than are no more than 12 months aged to Engineer for pipeline regulatory compliance.
- e) D.O.T. Regulations require that the gas system operator must ensure that all persons who make or inspect joints are qualified (CFR 49, Part 192, §192.285(d) & §192.287).

#### 10. Pipe Preparation

- a) Cut pipe ends square using, pipe cutters, motor drive saws using abrasive disks, or with handsaws as required. Where machining is necessary for cut ends or for extending factory machining, it shall be done in accordance with the manufacturer's recommendations for the type of pipe and joint used. The flame cutting of pipe by means of an oxyacetylene torch will not be allowed.
- b) Remove scale, dirt and pipe cutting debris on inside and outside before assembly. Contractor shall collect and bag pipe debris for proper disposal off-site.
- c) Prepare piping connections with flanges or threading and unions.
- d) Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.
- e) Clean pipe ends prior to welding per instructions from manufacturer.

#### 11. Installation

- a) Installation of pipe, fittings, specials, adapters and appurtenances shall conform to the manufacturer's recommendations and the following summary of installation recommendations. Where specifications and recommendations conflict, the strictest shall apply.
- b) Electrofusion socket couplings shall not be used without prior Engineer's approval. Locations of such coupling use shall be located by survey.
- c) Proper implements, tools and facilities recommended by manufacturer and satisfactory to the Engineer shall be provided and used by the Contractor for the safe and convenient execution of the work.
- d) Pipe shall be laid to the lines and grades on a prepared earth subgrade or special embedment as indicated on the Plans or as otherwise specified. A minimum of 3 feet of cover shall be installed over the completed pipe, unless otherwise indicated, or other means are employed to protect the pipe.
- e) Open Trench Installation:
  - 1. The centerline of the pipe shall not deviate from a straight line drawn between the centers of the openings at the ends of the pipe by more than 1.0 times the pipe diameter. If a piece of pipe fails to meet this requirement check for straightness, it shall be rejected and removed from the site. Laying instructions of the manufacturer shall be explicitly followed.
  - 2. Good alignment shall be preserved during installation. Deflection of the pipe shall occur only at those places on design Plans and as approved by the Engineer. Follow Manufacturers recommendation for maximum allowable bending radius to achieve change in pipe direction without fittings. Fittings, in addition to those shown on the Plans, shall be used only if necessary or required by the Engineer.
  - 3. Each length of the pipe shall have the assembly mark aligned with the pipe previously laid and held securely until enough backfill has been placed to hold the pipe in place.
  - 4. Precautions shall be taken to prevent flotation of the pipe in the trench.
  - 5. When moveable trench bracing such as trench boxes, moveable sheeting, shoring or plates are used to support the sides of the trench, care shall be taken in placing and moving the boxes or supporting bracing to prevent movement of the pipe, or disturbance of the pipe bedding and the backfill. Trench boxes, moveable sheeting, shoring or plates shall not be allowed to extend below top of the pipe. As trench boxes, moveable sheeting, shoring or plates are moved, pipe bedding shall be placed to fill any voids created and the backfill shall be recompacted to provide uniform side support for the pipe.
- f) Under no circumstances shall the pipe or fittings be dropped into the trench or forced through a directional bore upon pull-back. No pipe shavings or any pipe pieces shall be allowed into the trench. If such pieces enter the trench, they shall be removed prior to backfilling.
- g) All HDPE pipe must be at the temperature of the surrounding soil at the time of backfilling and compaction.

- h) Casing pipe shall comply with PART 2.0.
- i) The interior surface of all pipes shall be cleaned when installed, and shall be kept clean until final acceptance. Removable end caps shall be placed on all open ends of pipelines when pipe laying is not actively in progress. The bulkheads shall be designed to prevent the entrance of dirt, debris or small animals, and shall not be removed until pipe laying is resumed.
- j) Securing the Trench: Contractor shall plan the work so that no more than 200 LF of open trench shall remain open overnight. Open trench shall be secured against accidental entry. Pipe shall be secured from entry of foreign matter.

## 12. HDPE Pipe Joints

- a) Heat Fusion Joining: Butt, socket, and saddle fusion joints in polyethylene gas piping shall be made using procedures that have been qualified and approved by the Manufacturer in accordance with Title 49, CFR, Part 192.283.
- b) In accordance with 49CFR192, Section 192.285, the Contractor shall ensure that all persons making heat fusion joints have been qualified to make joints in accordance with the Manufacturer's Approved Qualified Fusion Procedures. The Contractor shall maintain records of qualified personnel, and shall certify that qualification training was received not more than 12 months before commencing construction. The Contractor shall ensure that all persons making heat fusion joints are qualified in accordance with this section.
- c) The Manufacturer shall offer qualified fusion procedures and training materials for the use of the Contractor.
- d) Butt Fusion of Unlike Wall Thickness: Butt fusion shall be performed between pipe ends, or pipe ends and fitting outlets that have the same outside diameter and are not different in wall thickness by more than one Standard DR, for example, SDR 9 to SDR 11. Transitions between unlike wall thickness greater than one SDR shall be made with a transition nipple (a short length of the heavier wall pipe with one end machined to the lighter wall). Standard DR's for polyethylene pipe are 7.3, 9, 11, 13.5, 17, 21 and 26.
- e) Joining by Other Means: Polyethylene gas pipe and fittings may be joined together or to other materials by transition fittings, flanged joints, or electrofusion sockets. These devices shall be designed for joining polyethylene to another material and shall be approved by the Engineer prior to use in the gas system. When joining by other means, the installation instructions of the joining device manufacturer shall be adhered to by Contractor.
- f) The Contractor shall maintain records of pipe welds. Records of temperature, pressure and graph of fusion cycle shall be recorded. An example welding log is attached to this section and a similar log shall be maintained for each pipe weld.
- g) Butt Fusion Welds: It is the intention of these specifications to establish a preference for butt fusion welds over methods of pipe joining. Contractor shall work the pipe from the surface sufficiently in advance of lowering the welded pipe into the excavated trench. Where due to location of pipe excavation, or geometric obstacles preventing the use of butt fusion welds, Contractor may request Engineer's approval to use an electrofusion coupling to join the pipe.

## 13. Excavation and Bedding

- a) Excavate pipe trench in accordance with DELDOT standard specifications.
- b) Excavation: Trench excavations shall conform to the Plans. The Contractor shall remove excess groundwater. Where necessary, trench walls shall be shored or reinforced, and all necessary precautions shall be taken to ensure a safe working environment.
- c) Utility Crossings: Locate utilities sufficiently in advance of pipe work to allow a change in elevation to proceed without use of fittings, if possible. Hand dig or use other low impact methods approved by Engineer to locate marked utilities. When utility being crossed has been located both directionally and in elevation, proceed with installation of pipe. When an unmarked utility has been encountered, immediately inspect the area for safety and then notify Engineer. Time of notification to Engineer will begin provisions for pay item, if allowed.
- d) Burial Depth: Establish elevations of buried piping with not less than the following cover:
  - 1. 36-inches of cover in non-traffic areas.
  - 2. 36-inches of cover in roadways, driveways and parking areas.
- e) Backfill-regular: Where excavated soil contains rocks over 2" in any dimension, or where existing soil in the opinion of Engineer is not suitable for direct contact with pipe, Contractor shall place bedding material at trench bottom. Pipe shall be installed on top of bedding material and either excavated

material (if material is less than 1" in any direction) or bedding material will be placed in trench in one continuous layer to a level at least 6 inches above the top of pipe prior to employing any compaction. During embedment, placement and compaction, care shall be taken to ensure that the haunch areas below the pipe springline are completely filled and free of voids. Initial lift and subsequent lifts of 6 inches in thickness shall be compacted to at least a 90% Standard Proctor Density until surface grade is reached. Once the pipe is covered, soil removed from excavation will be reemployed for trench backfill unless specifically rejected by Engineer. No trash or particle sizes over 6 inches in any dimension shall be placed at any location in the trench. Installed pipe shall not be covered with soil until observed by Engineer or his/her representative.

- f) Foundation & Bedding: Pipe shall be laid on grade and on a stable foundation. Unstable trench bottom soils shall be removed, and a 6" foundation or bedding of lining material complying with DELDOT specifications shall be installed to pipe bottom grade. A trench cut in rock or stony soil shall be excavated to 6" below pipe bottom grade, and brought back to grade with compacted utility backfill as specified in DELDOT specifications. All ledge rock, boulders and large stones shall be removed. When in the opinion of the Engineer, the existing earth from the trench excavation is unsuitable for bedding the pipe the Contractor shall over-excavate the trench as required on the Plans and make a suitable bed for the pipe.
- g) Marking: Install tracer wire on side of pipe in continuous lengths from test station to test station without splices. If a splice is required, use splice kits from wire manufacturer and record location by survey. Have Engineer approve location of splice prior to performing work.
- h) Embedment materials shall be in accordance with DELDOT specifications. Backfill and bedding materials shall be free of debris.

#### 14. Survey Record

- a) Contractor shall employ a licensed professional surveyor (or Engineer approved method) to provide an as-built northing and easting survey at the same datum used for the Plans at 50 foot or less increments along straight and linear sections of the pipe and obtain specific coordinates at all special features such as pipe electro-fusion welds, fittings, valves, utility crossings, etc. Surveyor shall record a surface elevation at the same location of the pipe and special features and Contractor shall provide a measurement of surface grade at the location surveyed.
- b) Any utility crossed shall have its location surveyed along with elevations of each pipe.
- c) Contractor shall provide the Survey Record as-builts to Engineer for review and approval as a Submittal in red-line hard copy format and electronic AutoCADD format.

#### 15. Testing and Acceptance Tests

- a) All pipe, fittings and appurtenances and tracer wire shall be field-tested. Contractor shall supply all labor, equipment, material, gages, pumps, meters and incidentals required for testing. Each main shall be pressure tested upon completion of the pipe laying and backfilling operations, including placement of any required temporary roadway surfacing.
- b) Tracer wire shall demonstrate electrical conductance between each test station.
- c) No leakage is allowed from pipe during testing, although appropriate allowances for expansion of pipe shall be taken into consideration for the test pressure. Refer to PART 3, "Piping Systems".
- d) Fusion and Weld Quality:
  - 1. The Contractor shall ensure the field set-up and operation of the fusion equipment, and the fusion procedure used by the Contractor's fusion operator while on site.
  - 2. Upon request by the Engineer, the Contractor shall verify field fusion quality by making and testing a trial fusion. The trial fusion shall be allowed to cool completely; then test straps shall be cut and bent strap tested in accordance with ASTM D 2657.
  - 3. If the bent strap test of the trial fusion fails at the joint, the field fusions represented by the trial fusion shall be rejected.
  - 4. The Contractor at his sole expense shall make all necessary corrections to equipment, set-up, operation and fusion procedure, and shall re-make the rejected fusions.
- e) Polyethylene pipe gas systems that are subject to D.O.T. Pipeline Safety Regulations shall be tested in accordance 49CFR192, Sections 192.509, 192.511, or 192.513 as applicable. The Contractor must submit a plan for testing to the Engineer for review at least 10 days before starting the test.
- f) The Contractor shall take precautions to eliminate hazards to persons near pipes being tested. Pipes being tested shall be supervised by Contractor.

- g) Contractor shall pressure test pipe in incremental segments during construction at pressures of at least 90 psi using air. The following pipe segments will be pressure tested upon completion:
  - 1. New 12" LFG Pipeline
  - 2. New 6" LFG Pipeline
- h) Provide results of pipe segment testing to Engineer within 24 hours after test.
- i) The final acceptance of the pipe by Engineer is dependent upon an air pressure test performed at 1.5 times Design Operating Pressure (60psi MAOP) or 125psi, whichever is higher. Test duration shall be for 8 hours with a time recording pressure gage that has been certified for accuracy at least 30 days prior to the test date. The time of the test will begin when the pressure reading has stabilized due to temperature.
- j) When pressure tests do not meet specified requirements, remove defective work, replace and retest as detailed above. Contractor shall continue this process of leak detection, repair and pressure testing until a satisfactory pressure test is achieved.
- k) Leave at least 30 psi of air pressure on the accepted pipe until evacuated by Owner during commissioning and start-up activities.

## 2.0 PART 2 - PIPING SYSTEMS

### 2.1 DESCRIPTION:

Under this Section, the Contractor shall furnish all labor, materials and equipment for Piping Systems, as shown on the Plans, as specified and/or directed.

### 2.2 MATERIALS:

The publications listed below and their latest revisions form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only.

#### American National Standards Institute (ANSI) Publications:

- B1 Unified Inch Screw Threads (UN and UNR Thread Form)
- B2.1 Pipe Threads (Except Dryseal)
- B2.4 Hose Coupling Screw Threads
- B16.5 Pipe Flanges and Flanged Fittings
- B16.10 Face to Face and End to End Dimensions of Ferrous Valves
- B16.21 Nonmetallic Flat Gaskets for Pipe Flanges
- B16.34 Valves Flanged and Buttwelding End
- B18.2.1 Square and Hex Bolts and Screws Inch Series Including Hex Cap Screws and Lag Screws
- B18.2.2 Square and Hex Nuts
- B31.9 Building Services Piping
- B40.1 Gauges Pressure Indicating Dial Type Elastic Element
- Z49.1 Safety In Welding and Cutting

#### American Society for Testing and Materials (ASTM) Publications:

- A53 Pipe, Steel, Black and Hot Dipped, Zinc-Coated, Welded and Seamless
- A194 Carbon and Alloy Steel Nuts for Bolts for High Pressure and High Temperature Service
- A276 Stainless and Heat-Resisting Steel Bars and Shapes
- A307 Carbon Steel Externally Threaded Standard Fasteners
- A386 Zinc Coating (Hot Dip) on Assembled Steel Products
- A525 Sheet Steel, Zinc Coated (Galvanized) by the Hot Dip Process
- A774 As-Welded Wrought Austenitic Stainless Steel Fittings for General Corrosive Service at Low and Moderate Temperatures
- D1654 Painted or Coated Specimens Subjected to Corrosive Environments

#### 1. Manufacturers Standardization Society of the Valve and Fittings Industry (MSS) Publications:

- SP 58 Pipe Hangers and Supports Materials, Design and Manufacture
- SP 69 Pipe Hangers and Supports Selection and Application

**Buy American Requirements:**

In accordance with Section 165 of the Surface Transportation Assistance Act of 1982, Title 23 of the United States Code, and per Section 106.06 Buy American Contract Requirements of the Delaware Department of Transportation Standard Specifications for Road and Bridge Construction, the following applies to all contracts:

For this Contract, all iron, coating materials, steel materials, and coating of steel must be produced in the United States, except a minimal amount of foreign steel materials may be used provided the cost of materials does not exceed 0.1% of the total Contract cost or \$2,500.00, whichever is greater.

- A. Certificate of Compliance - A Certificate of Compliance shall be furnished to the Department by the Contractor. The Certificate shall be signed by the Contractor to the effect that the materials and/or assembled materials will be of domestic origin and will comply in all respects with the requirements of the Contract. Mill test reports verifying that steel products are of domestic origin as defined in the Special Provisions shall be provided. All materials accepted on the basis of Certificate of Compliance may be sampled and tested at any time. Use of material on the basis of Certificate of Compliance shall not relieve the Contractor of responsibility for incorporating material in the Project conforming to the requirements of the Contract. Any material not conforming to such requirements shall be subject to rejection whether in place or not. The Department reserves the right to refuse to permit the use of material on the basis of Certificate of Compliance.
- B. Domestic Material - Domestic materials are those which are melted, cast- formed, shaped, drawn, extruded, forged, fabricated, or otherwise processed in the United States.

**2.3 CONSTRUCTION METHODS:**

**1. Submittals**

- a) Manufacturer's Data:
  - a Piping and Fittings
  - b Warning Tape

**2. Safety Precautions**

- a) Rotating Equipment Safety: Fully guard couplings, motor shafts, gears and other exposed rotating or rapidly moving parts in accordance with ASME B15.1. The guards shall be cast iron or expanded metal. Guard parts shall be rigid, secured, and readily removable without disassembling the guarded unit.
- b) Welding and Cutting Safety: ANSI Z49.1.

**3. Piping Schedule**

Piping shall be provided in accordance with the following schedule unless specified or indicated otherwise.

<b>Service</b>	<b>Sizes</b>	<b>Pipe</b>	<b>Joint</b>
Landfill Gas Conveyance/Carrier Pipe	All	DR-11 HDPE	Butt-Fusion or Electro-fusion
Casing Pipe	All	SCH 10, Seamless Carbon Steel ASTM A53 Grade B (unless otherwise noted)	Butt Welded, Flanged or Grooved Joint Piping System, ANSI B16.9 or ANSI B16.5, Class 150

**4. Landfill Gas Piping, Fittings and Accessories**

- a) HDPE Piping: HDPE piping and fittings shall be as specified above in PART 1, "High Density Polyethylene (HDPE) Pipe and Fittings".

b) Flanged Joints:

1. Flanges: Provide ANSI B16.1, Class 150 flanges for all flange connections. Backup rings shall be lightweight stainless steel.
2. Bolting of Flanges: Material used for bolts, studs and nuts shall be stainless steel conforming to ASTM A276, Type 304, and material for nuts shall be stainless steel conforming to ASTM A276, Type 304, for all valves and fittings. Dimensions of bolts, studs, and nuts shall conform to ANSI B182.2.1 and ANSI B18.2.2 with threads conforming to ANSI B1.1 coarse type with Class 2A fit for bolts and studs, and Class 2B fit for nuts. Bolts or studs shall extend through the nuts and may have reduced shanks of a diameter not less than the diameter at root of threads. Bolts shall have American Standard regular square or heavy hexagon heads and shall have American Standard heavy, semi-finished hexagonal nuts.
3. Gaskets: All flange gaskets shall be Viton, suitable for the pressure and temperature ranges encountered, and compatible with the flange faces. Dimensions for nonmetallic gaskets shall conform to ANSI B16.21.

5. Casing Pipe Fittings and Accessories

- a) Casing Pipe: Steel casing pipe shall be SCH 10, Seamless Carbon Steel ASTM A53 Grade B
- b) Grooved Joint Piping System: Carbon Steel, A-53B/A-106B - Roll or cut grooved-ends as appropriate to pipe material, wall thickness, pressures, size and method of joining. Pipe ends to be grooved in accordance with and conforming to ANSI C-606.
- c) Mechanical Couplings for Joining Carbon Steel Pipe: Manufactured in two segments of cast ductile iron, conforming to ASTM A-536, Grade 65-45-12. Gaskets shall be pressure-responsive synthetic rubber, grade to suit the intended service, conforming to ASTM D-2000. Mechanical Coupling bolts shall be zinc plated (ASTM B-633) heat treated carbon steel track head conforming to ASTM A-449 and ASTM A-183, minimum tensile strength 110,000 psi as provided by manufacturer of grooved joint piping system.
- d) Manufactured Fittings/Valves: All fittings, valves and appurtenances for the grooved joint piping system shall be provided by an established manufacturer of grooved joint piping systems. Manufacturer shall be as by Victaulic, Grinnell or approved equal.

6. Buried Warning and Identification Tape

- a) Polyethylene plastic and metallic core or metallic faced, acid and alkali resistant, polyethylene plastic warning tape manufactured specifically for warning and identification of buried utility lines. Provide tape on rolls, six-inch minimum width, color coded as stated below for the intended utility with warning and identification imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION, BURIED (GAS) LINE BELOW" or similar wording. Color and printing is to be permanent, unaffected by moisture or soil.
- b) Install tape in accordance with manufacturer's recommendations except as modified herein. Bury tape at the depth indicated on Plans.
- c) Warning Tape Color Codes

Red:	Electric
Yellow:	Gas, Oil, Dangerous Materials
Orange:	Telephone and Other Communications
Blue:	Water Systems
Green:	Sewer Systems
White:	Steam Systems

7. Installation

Install piping and piping components to ensure proper and efficient operation of the equipment and controls and in accordance with manufacturer's printed instructions. All pipe and fittings shall be carefully handled by means of suitable equipment, in such a manner as to prevent damage to materials and protective coatings or linings. Under no circumstances shall materials be dropped or damaged during installation. Pipe or fittings which are damaged during construction shall be repaired or replaced at no expense to the Owner.

## 8. Piping Systems

Cut to the measurements established at the site and work into place without springing or forcing. Install piping with line flexibility included to absorb the expansion and contraction due to temperature changes of the piping systems. Piping line flexibility shall be achieved by the use of pipe bends or loops.

- a) Flanged Joints: Faced true, square, tight and used as indicated and where necessary for normal maintenance. Mate with valves and the various equipment connections. Remove the raised faces from fittings or equipment having raised faces. Flanged joints shall be firmly bolted with through, stud or tap bolts.
- b) Dielectric Unions or Flanges: Provide between ferrous and nonferrous piping, equipment, and fittings; except that bronze valves and fittings may be used without dielectric couplings for ferrous to ferrous or nonferrous to-nonferrous connections. Flanges and unions shall conform to the requirements of ANSI B16.10.

## 9. Landfill Gas Piping

- a) Fabrication and Assembly of Piping and Components: Assembly and connection of plastic piping (PVC or HDPE) shall be in accordance with the appropriate specification section and as specified herein. All piping shall follow the general arrangement shown, cut accurately to measurements established for the work by the Contractor, and worked into place without springing or forcing. Provide for expansion and contraction of pipelines. Make changes in size of pipelines with reducing fittings. Protect materials and equipment from the weather. Do not miter pipe to form elbows, or notch straight runs to form full sized tees, or utilize any similar construction. Thoroughly clean each section of pipe, fittings, and valves to be free of all foreign matter before erection. Contractor shall take care during fabrication to avoid unnecessary debris (especially pipe shavings) from entering the pipe. Flushing of the pipe with water or compressed air shall be done at the discretion of the field engineer to remove rust scale, oil, pipe shavings, or any other debris. Plug or cap open ends of mains during all shutdown periods. Do not leave lines open at any place where foreign matter might accidentally enter.
- b) Cutting of pipe shall be done with pipe cutters, motor drive saws using abrasive disks, or with handsaws as required. Where machining is necessary for cut ends or for extending factory machining, it shall be done in accordance with the manufacturer's recommendations for the type of pipe and joint used. The flame cutting of pipe by means of an oxyacetylene torch will not be allowed.
- c) Fittings and pipe within structures shall be placed to line and grade and properly supported before joints are made. The Contractor shall furnish all the necessary pipe supports, including stirrups, rods, clamps, hangers, pipe columns and piers, necessary to sustain the pipe and fittings in a firm and substantial manner to the lines and grades given.

## 10. Cleaning of Systems

When installations of the various components of the piping systems are completed, clean by flushing with water before final closing. Clean all piping and components of scale and thoroughly flush out all foreign matter. Clean all strainers and valves thoroughly. Wipe equipment clean, removing all traces of oil, dust, dirt, or paint spots. Maintain the system in this clean condition until final approval. Clean and paint piping and equipment as specified herein.

## 11. Field Tests

After completion of the piping installation and prior to initial operation, conduct tests on the piping system. Furnish materials and equipment required for tests. Correct defects disclosed by the test. The test shall be performed once a minimum of 2 feet of backfill has been placed and compacted around the pipe and in the presence of the Engineer. No leakage is permitted although appropriate allowances for expansion of pipe shall be taken into consideration during the hydrostatic testing according to the manufacturer's recommendations. If the pressure loss exceeds the maximum allowable loss under the manufacturer's recommendation, the pipe section shall be repaired and retested until acceptable results are achieved. No expansion allowances shall be permitted for pneumatic tests.

- a) Landfill Gas Piping:

Test in accordance with PART 1, High Density Polyethylene (HDPE) Pipe and Fittings.

12. Inspection

All pipelines shall be visually inspected by means of pipeline television camera and recorded permanently on video cassette or DVD. Provide three (3) copies of record copy. Any abnormalities or deficiencies determined by the camera inspection shall be repaired and re-inspected by television camera after the repair. All necessary repairs and re-inspections shall be provided at no additional cost to the Owner.

13. Startup and Operational Tests

Start up and initially operate the system. During this time, observe the operation of the system and correct any defects or abnormalities which may occur in the overall system.

3.0 PART 3 - PAINTING

3.1 DESCRIPTION:

Under this Section, the Contractor shall furnish all labor, materials and equipment for Painting as shown on the Plans, as specified and/or directed.

3.2 MATERIALS:

The publications listed below and their latest revisions form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only.

Code of Federal Regulations (CFR) Publications:

29 1910.1000 Occupational Safety and Health Standards

29 1910.1025 Occupational Safety and Health Standards (Lead)

Federal Standard (FED STD):

313 Material Safety Data Sheets Preparation and Submission of

Steel Structures Painting Council (SSPC) Publications:

Paint 1 Shop, Field, and Maintenance Painting

Paint 3 A Guide to Safety in Paint Application

Paint 20 Zinc Rich Primers (Type I, Inorganic, and Type II Organic)

SP 1 Solvent Cleaning

SP 2 Hand Tool Cleaning

SP 3 Power Tool Cleaning

SP 6 Commercial Blast Cleaning

SP 7 Brush Off Blast Cleaning

SP 10 Near White Blast Cleaning

VIS1 Pictorial Surface Preparation Standards for Painting Steel Surfaces, Guide to

Provide as far as practical, pretreatments, primers and top coats from one coating manufacturer. Coatings shall be applied as a complete system and must be compatible with the substrate and each coating component. Coating systems shall be the manufacturer's industrial or commercial systems and are specified by generic type only. Residential coating systems shall not be permitted.

3.3 SUBMITTALS:

Submit the following:

1. Manufacturer's Instructions
  - a) Paint application instructions
  - b) Manufacturer's material safety data sheets

Submit Manufacturer's material safety data sheets for coatings, solvents, and other potentially hazardous materials, as defined in FED STD 313.

### 3.4 REGULATORY REQUIREMENTS:

#### 1. Lead Content

Do not use coatings having a lead content over 0.06 percent by weight of nonvolatile content.

#### 2. Chromate Content

Do not use coatings containing zinc chromate or strontium chromate.

#### 3. Asbestos Content

Materials shall not contain asbestos.

### 3.5 DELIVERY AND STORAGE:

Deliver materials in sealed, labeled containers bearing the manufacturer's name, brand designation, specification number, batch number, color, and date of manufacture. Restrict storage and mixing of materials to locations designated by the Engineer.

### 3.6 SAFETY METHODS:

Apply coating materials using safety methods and equipment in accordance with the following:

#### 1. Safety Methods Used During Coating Application

Comply with the requirements of SSPC Paint 3.

#### 2. Toxic Materials

To protect personnel from overexposure to toxic materials, conform to the most stringent guidance of:

- a) The chemical manufacturer when using mineral spirits, or other chemicals. Use impermeable gloves, chemical goggles or face shield, and other recommended protective clothing and equipment to avoid exposure of skin, eyes, and respiratory system. Conduct work in a manner to minimize exposure of building occupants and the general public.
- b) The appropriate OSHA standard in 29 CFR 1910.1025 for surface preparation on painted surfaces containing lead, zinc chromate, strontium chromate, asbestos, or other toxic ingredients.
- c) 29 CFR 1910.1000.
- d) Threshold Limit Values (R) of the American Conference of Governmental Industrial Hygienists.
- e) Manufacturer's Material Safety Data Sheets (MSDS).

### 3.7 ENVIRONMENTAL CONDITIONS:

#### 1. Exterior Coatings

Do not apply coating to surfaces during foggy or rainy weather, or under the following surface temperature conditions:

- a) Less than 5 degrees F above the dew point;
- b) Below 40 degrees F (for oil based paints), 50 degrees F (for latex paints), or over 95 degrees F, unless approved by the Engineer.

### 3.8 COLOR SELECTION:

1. Colors of finish coats shall be as indicated or specified. Where not indicated or specified, colors shall be selected by the Engineer.

### 3.9 LOCATION AND SURFACE TYPE TO BE PAINTED:

1. Painting Included: Where a space or surface is indicated to be painted, include the following unless indicated otherwise.
  - a) Surfaces behind portable objects and surface mounted articles readily detachable by removal of fasteners, such as screws and bolts.
  - b) New factory finished surfaces that require identification or color coding and factory finished surfaces that are damaged during performance of the work.
  - c) Existing coated surfaces that are damaged during performance of the work.
2. Painting Excluded: Do not paint the following unless indicated otherwise.
  - a) Surfaces concealed and made inaccessible by panelboards, fixed ductwork, machinery, and equipment fixed in place.
  - b) Surfaces in concealed spaces. Concealed spaces are defined as spaces above suspended ceilings, furred spaces, attic spaces, crawl spaces, and chases.
  - c) Steel to be embedded in concrete.
  - d) Copper, stainless steel, aluminum, brass, and lead except existing coated surfaces.

### 3. Mechanical and Electrical Painting:

Includes field coating of exterior new surfaces.

- a) Where a space or surface is indicated to be painted, include the following items unless indicated otherwise.
  - 1) Exposed piping, conduit, and ductwork;
  - 2) Supports, hangers, air grilles, and registers;
  - 3) Miscellaneous metal work and insulation coverings.
- b) Do not paint the following, unless indicated otherwise:
  - 1) New zinc coated, aluminum, and copper surfaces under insulation.

### 3.10 PROTECTION OF AREAS AND SPACES:

1. Prior to surface preparation and coating applications, remove, mask, or otherwise protect, hardware, hardware accessories, machined surfaces, radiator covers, plates, lighting fixtures, public and private property, and other such items not to be coated that are in contact with surfaces to be coated. Following completion of painting, workmen skilled in the trades involved shall reinstall removed items. Restore surfaces contaminated by coating materials, to original condition and repair damaged items.

### 3.11 SURFACE PREPARATION:

1. Remove dirt, splinters, loose particles, grease, oil, [disintegrated coatings,] and other substances deleterious to coating performance as specified for each substrate.
2. Existing Coating Surfaces With No Defects:

Before application of coatings, perform the following on surfaces covered by soundly adhered coatings, defined as those which cannot be removed with a putty knife:

- a) Wipe previously painted surfaces to receive solvent based coatings, except stucco and similarly rough surfaces clean with a clean, dry cloth saturated with mineral spirits, FS TT T 291. Allow surface to dry. Wiping shall immediately precede the application of the first coat of any coating, unless specified otherwise.
- b) Sand existing enamel and other glossy surfaces to remove gloss. Brush and wipe clean with a dry cloth.

- c) The requirements specified are minimum. Comply also with the instructions and recommendations of the paint manufacturer for preparation and application.]

3. Existing Coated Surfaces with Minor Defects:

Sand, spackle, and treat minor defects to render them smooth. Minor defects are defined as scratches, nicks, cracks, gouges, spalls, alligating, chalking, and irregularities due to partial peeling of previous coatings.]

4. Removal of Existing Coatings: Remove existing coatings from the following surfaces:

- a) Surfaces containing large areas of minor defects;
- b) Surfaces containing more than 20 percent peeling area; and
- c) Surfaces designated by the Engineer, such as surfaces where rust shows through existing coatings.]

5. Substrate Repair:

- a) Repair substrate surface damaged during coating removal;
- b) Sand edges of adjacent soundly adhered existing coatings so they are tapered as smooth as practical to areas involved with coating removal; and
- c) Clean and prime the substrate as specified.

3.12 PREPARATION OF METAL SURFACES:

1. Existing and New Ferrous Surfaces:

- a) Shop coated Surfaces and Small Areas That Contain Rust, Mill Scale and Other Foreign Substances: Solvent clean in accordance with SSPC SP 1 to remove oil and grease. Where shop coat is missing or damaged, clean according to SSPC SP 2 or SSPC SP 3.
- b) Surfaces With More Than 20 Percent Rust, Mill Scale, and Other Foreign Substances: Clean entire surface in accordance with SSPC SP 6.
- c) Galvanized steel shall be prepared for painting in accordance with ASTM D6386.
- d) Immersed Surfaces to Receive a Coating: Clean in accordance with SSPC SP 10.

2. Final Ferrous Surface Condition: Cleaned surface shall be similar to photographs in SSPC VIS1 as follows:

DEGREE OF CLEANING	ADHERENT MILL SCALE	RUSTING MILL SCALE	RUSTED	PITTED AND RUSTED
Hand Tool Cleaning SSPC SP 2	(1)	B St 2	C St 2	D St 2
Power Tool Cleaning SSPC SP 3	(1)	B St 3	C St 3	D St 3
Commercial Blast Cleaning SSPC SP 6	(1)	(1)	C Sa 2	D Sa 2
Brush-Off Blast Cleaning SSPC SP 7	(1)	B Sa 1	C Sa 1	D Sa 1
Near White Blast Cleaning SSPC SP 10	A Sa 2-1/2	B Sa 2-1/2	C Sa 2-1/2	D Sa 2-1/2]

Note: (1) No photograph is available or recommended for comparison

### 3.13 APPLICATION:

#### 1. Coating Application:

Apply coating materials in accordance with SSPC Paint 1. SSPC Paint 1 methods are applicable to all substrates, except as modified herein. Thoroughly work coating materials into joints, crevices, and open spaces. Touch up damaged coatings before applying subsequent coats.

- a) **Drying Time:** Allow time between coats, as recommended by the coating manufacturer, to permit thorough drying. Provide each coat in specified condition to receive the next coat.
- b) **Primers, and Intermediate Coats:** Do not allow primers or intermediate coats to dry more than 30 days, or longer than recommended by the manufacturer, before applying subsequent coats. Follow manufacturer's recommendations for surface preparation if primers or intermediate coats are allowed to dry longer than recommended by manufacturers of subsequent coatings. Each coat shall cover the surface of the preceding coat or surface completely, and there shall be a visually perceptible difference in shades of successive coats.
- c) **Finished Surfaces:** Provide finished surfaces free from runs, drops, ridges, waves, laps, brush marks, and variations in colors.

#### 2. Equipment:

Apply coatings with approved brushes, approved rollers, or approved spray equipment, unless specified otherwise. Spray areas made inaccessible to brushing by items such as ducts and other equipment.

#### 3. Thinning of Paints:

Reduce paints to proper consistency by adding fresh paint, except when thinning is mandatory for the type of paint being used. Obtain written permission from the Engineer to use thinners. The written permission shall include quantities and types of thinners to use.

#### 4. Coating Systems:

- a) **Systems by Substrates:** Apply coatings that conform to the respective specifications listed in the following Tables:

Table  
I Exterior Metal Surfaces

- b) **Minimum Dry Film Thickness (DFT):** Apply paints, primers, varnishes, enamels, undercoats, and other coatings to a minimum dry film thickness of 1.5 mil each coat unless specified otherwise in the Tables. Coating thickness where specified, refers to the minimum dry film thickness.
- c) **Coatings for Surfaces Not Specified Otherwise:** Coat surfaces which have not been specified, the same as surfaces having similar conditions of exposure.
- d) **Existing Surfaces Damaged During Performance of the Work, Including New Patches In Existing Surfaces:** Coat surfaces with the following:
  - (1) One coat of primer.
  - (2) One coat of undercoat or intermediate coat.
  - (3) One top coat to match adjacent surfaces.
- e) **Existing Coated Surfaces To Be Painted:** Apply coatings conforming to the respective specifications listed in the Tables herein, except that pretreatments, sealers, fillers, and primers need not be provided on surfaces where existing coatings are soundly adhered and in good condition.

### 3.14 COATING SYSTEMS FOR METAL:

#### 1. Primer:

Apply specified ferrous metal primer on the same day that surface is cleaned. If flash rusting occurs, re clean the surface prior to application of primer.

- a) **Inaccessible Surfaces:** Prior to erection, use two coats of the specified primer on metal surfaces that will be inaccessible after erection.

- b) Shop primed Surfaces: Touch up exposed substrates and damaged coatings to protect from rusting prior to applying field primer.
- c) Pipes and Tubing: The semitransparent film applied to pipes and tubing at the mill is not to be considered a shop coat. Apply specified ferrous metal primer prior to application of subsequent coats.
- d) Exposed Nails, Screws, Fasteners, and Miscellaneous Ferrous Surfaces: On surfaces to be coated with water thinned coatings, spot prime exposed nails and other ferrous metal with latex primer.

2. Apply coatings of Tables I. "DFT" means dry film thickness in mils.

3.15 INSPECTION AND ACCEPTANCE:

In addition to meeting the previously specified requirements, demonstrate the mobility of moving components, including but not limited to swinging and sliding doors, cabinets, and windows with operable sash, for inspection by the Engineer. Perform this demonstration after appropriate curing and drying times of the coatings have elapsed and prior to invoicing for final payment.

TABLE I EXTERIOR METAL SURFACES							
CONDITION	PREPARATION	FIRST COAT	DFT	SECOND COAT	DFT	THIRD COAT	DFT
Severe	SSPC SP 6	Epoxy-Polyamide	4.0	Aliphatic Polyester Polyurethane	1.5	X	X
Mild	SSPC SP 6	Alkyd-Phenolic Primer	2.0	Alkyd	1.5	Alkyd	1.5

4.0 MEASUREMENT AND PAYMENT

METHOD OF MEASUREMENT:

This quantity of DSWA Landfill Gas Conveyance Facility will not be measured.

BASIS OF PAYMENT:

The quantity of DSWA Landfill Gas Conveyance Facility will be paid for at the Contract lump sum. Price and payment will constitute full compensation for furnishing and placing all materials, system testing and acceptance of the DSWA Landfill Gas Conveyance Facility by the Engineer.

8/16/16

**619501 - PRODUCTION PILE RESTRIKE**  
**619502 - TEST PILE RESTRIKE**

**Description:**

Under certain pile driving conditions it may become necessary to restrike various production piles and test piles, of the sizes and type called for by the Contract, in order to verify the pile capacities. Some of the pile driving conditions that could result in the need for pile restrikes include; bearing capacities are not achieved by the initial driving, Contract Plans for driving based on tip elevation (bearing achieved by freeze), and dynamic analysis procedures require extended waiting times for restrike.

**Note:** These Special Provisions replace Subsection 619.14 of the Standard Specifications.

**Procedure:**

All test piles shall be restruck and dynamically tested by the Contractor. The Engineer may direct the Contractor to restrike selected production piles to verify capacities.

The Engineer will attempt to schedule the pile restrike so as to cause minimal, if any, delay to the overall driving operation.

Prior to restrike, the Contractor shall mark the pile in 1-inch increments for the first 1-foot and 1-foot increments thereafter. The piles restrikes shall be in accordance with the plans.

All restrikes shall be performed using the same pile hammer, helmet, and cushion material used to install the piles during initial driving. The pile hammer shall be fully warmed up and operated at full stroke, or as otherwise specified by the Engineer, during the pile restrike. The warm-up procedure shall consist of a minimum of 25 blows of the hammer at full stroke at locations other than the piles to be restruck.

The elevation of the top of the pile shall be established prior to performing the restrike.

The hammer shall be carefully lowered and positioned on the pile. The hammer shall restrike the pile 20 blows at the required stroke height.

The hammer shall be removed from the pile, and the new top of the pile elevation shall be established.

If for any reason, the pile hammer malfunctions, the helmet fails, the cushioning materials fail, or any other component of the pile driving system does not function properly during the pile restrike, the Contractor shall wait up to two (2) calendar days and perform additional restrikes at no additional cost to the Engineer or The Department until the pile driving system operates properly through a complete continuous restrike procedure.

**Method of Measurement/Basis of Payment:**

**Production Pile Restrike:**

This item shall be measured and paid for on a per each basis and payment will constitute full compensation for performing restrikes of selected production piles. The Engineer will work jointly with the Contractor to establish a sequencing of production pile restrikes to minimize impact to the Contractor's driving schedule. Any perceived mobilization costs, set-up costs, delay costs, etc. anticipated by the Contractor shall be incidental to the price for this item.

Payment for "Production Pile Restrikes" shall be made at the fixed price of \$500.00 Each if it is requested by the Department within five (5) working days of the completion of the initial driving of the pile to be restruck. Payment for "Production Pile Restrikes" with requested restrike wait time exceeding five (5) working days will be made at the fixed price of \$500.00 Each for each working day exceeded, starting on the sixth day, in addition to the fixed price of \$500.00 Each. An example of this case would be, if the Engineer directs a production pile restrike to be performed six (6) working days following the completion of the initial driving, two (2) unit will be paid. Similarly, if the restrike is ordered to be performed eight (8) working days following the completion of the initial driving, four (4) units will be paid. No payment will be made for additional days if the Contractor elects to wait longer to perform the restrike than the time frame as directed by the Engineer. Any overlapping days due to multiple production piles will be paid for only one day.

**Test Pile Restrike:**

This item will be measured on an Each Day basis. Test pile restrikes will not be paid for under this item unless the restrike waiting time is greater than five (5) working days following the completion of the initial driving. All test pile restrikes requested by the Department within the first five (5) working days following the completion of the initial driving shall be incidental to the installation of the test pile. An example of this case would be, if the Engineer directs a test pile restrike to be performed six (6) working days following the completion of the initial driving, one (1) unit will be paid. Similarly, if the restrike is ordered to be performed eight (8) working days following the completion of the initial driving, three (3) units will be paid. No payment will be made for additional days if the Contractor elects to wait longer to perform the restrike than the time frame as directed by the Engineer.

Payment for "Test Pile Restrike" on test piles with requested restrike wait time exceeding five (5) working days will be made at the fixed price of \$1,000.00 per Each Day. Any overlapping days due to multiple test piles will be paid for only one day.

Price and payment will constitute full compensation for all equipment, labor and materials necessary to perform a Test Pile Restrike as described above. Also included in the payment is the cost of any idle equipment, labor, etc. during the prescribed waiting period between initial driving and performance of the restrike.

11/23/11

**619519 –DYNAMIC PILE TESTING BY CONTRACTOR**  
**619539 – SIGNAL MATCHING ANALYSIS BY CONTRACTOR**

**Description:**

This item shall consist of furnishing all materials, equipment, access, reporting of results, and qualified personnel necessary to perform all wave equation analysis, high-strain dynamic testing and signal matching, and monitoring of driven piles at the locations designated on the Plans or as directed by the Engineer. The work shall also include analysis and report preparation in accordance with this Special Provision.

High-strain dynamic testing and signal matching shall be performed on all test piles for the entire duration of the test pile installation, re-strikes, and as indicated in the Plans.

The Contractor shall notify the Engineer of the proposed pile driving schedule at least two working days prior to driving piles at any location where high-strain dynamic testing will be conducted.

**Submittals:**

The Contractor shall engage the services of a specialty subcontractor, the Dynamic Testing Consultant (DTC), experienced in high-strain dynamic monitoring of driven piles to perform dynamic testing and signal matching analysis and to evaluate and report results to the Department. The Dynamic Testing Consultant shall have at least five (5) years of documented experience in the performance and interpretation of dynamic pile testing, including dynamic pile testing on open ended pipe piles. The Dynamic Testing Consultant's field engineer or technician, who will be operating the instrumentation and collecting the data, shall have documented experience on at least ten (10) prior projects with similar pile requirements, including pipe piles. All projects submitted as evidence of experience shall include the client and owner, points of contact, and a description of the pile type. The field engineer or technician responsible for operating the instrumentation shall be fully capable of understanding and interpreting the data being collected during driving. The Dynamic Testing Consultant shall be selected by the Contractor and submitted at the pre-construction meeting for approval by the Department.

a. Qualifying Experience

The Contractor shall submit proof of three or more projects of similar size and complexity where the DTC and personnel assigned to this project have successfully performed similar services and analyses within the last three years. The Contractor shall present the following information for each project listed as a reference at or prior to any preconstruction meetings:

1. Project Name, Location, Project Description, and Completion Date.
2. Surface and Subsurface Conditions.
3. Type and number of instruments installed.
4. Installation equipment and techniques utilized when applicable.
5. Provide names, current phone numbers, and current business addresses for the owner/designer, geotechnical consultant, and contract manager.

b. Wave Equation Analysis

The Contractor shall submit the completed Pile and Driving Equipment data form to the Department 30 to 45-days before mobilization to the site. The wave equation analysis of the proposed driving system shall be submitted to the Department at least 10-days prior to driving of the piles. The results of the wave equation analysis using the GRLWEAP program or other software approved by the Department shall be submitted in a bound report for review and approval. The wave equation analysis shall be performed at each test pile location and for each test pile type and driving equipment. Approval of the proposed driving system by the Department will be based on DelDOT Standard Specifications for Road and Bridge Construction, 2001, Section 619.09, Bearing Values.

c. Reports

The Dynamic Testing Consultant shall direct the progress of the testing work and shall obtain and record the test data. The Dynamic Testing Consultant shall prepare a daily field report summarizing the high-strain dynamic test results and pile driving data. At a minimum, the daily report shall include the calculated driving stresses, transferred energy, and estimated pile capacity at the time of testing. Pile driving logs shall be included with the submittal. Variations from previous trends in the dynamic test data shall also be noted. Daily field reports shall be faxed or transmitted electronically to the Engineer within 24-hours of the end of the shift.

The Dynamic Testing Consultant shall prepare a written report presenting the results of the pile program in accordance with the requirements of ASTM D4945 including specific discussion of the pile capacity obtained from the dynamic testing, the performance of the hammer and driving system, driving stress levels, and pile integrity. The following data shall also be provided in the report for the full length of driving at intervals of not more than 10 hammer blows: bearing capacity from the Case Goble method, bearing capacity from at least one additional recognized method, input and reflection values of force and velocity, maximum transferred energy, maximum compressive stress, maximum tensile stress, blows per minute, values of upward and downward traveling force wave, ram stroke, pile penetration depth and corresponding blow sequence.

Signal matching analyses shall be performed for all initial drives and restrikes of dynamically tested piles. A minimum of one (1) signal matching analysis shall be performed for a representative blow near the end of each initial drive and a minimum of one (1) representative blows shall be analyzed towards the beginning of the restrike.

Within three (3) working days of the completion of each dynamic test, the Contractor's specialty subcontractor shall submit to the Department a report meeting the requirements of this Special Provision that is signed and sealed by a Professional Engineer licensed in the State of Delaware. In addition to the raw data and ASTM D4945 requirements, the report shall include detailed results of the signal matching analyses including, but not limited to, pile driving log, all extrema tables; pile profile and pile model tables; simulated load test curves for the tip and top of the pile; the soil parameters used in the analysis by matching the measured and computed values of forces, velocities, and displacements; and static resistance distribution along the length of the pile, in a format approved by the Department. The Contractor is to develop the driving criteria for the production piles based on the results of the high strain dynamic testing with signal matching analysis. The Contractor shall submit the driving criteria for review and approval of the Engineer prior to ordering and installing production piles. The driving criteria shall be summarized in the format provided by the Engineer after award of the contract.

All raw data and computer analyses shall be provided in electronic format to the Department for additional analysis.

**Materials and Construction Methods:**

All equipment, testing and reporting procedures shall be provided and performed in strict accordance with ASTM D4945 - *Standard Test Method for High-Strain Dynamic Testing of Piles*.

The Contractor shall maintain a stock of at least four working accelerometers and strain transducers at the job site whenever high-strain testing is being performed. All repair or replacement costs shall be performed at no additional cost to the Engineer or The Department.

The Contractor shall provide the Engineer and The Department reasonable inspection access along the full length and circumference of all piles prepared for instrumentation attachment prior to the piles being lifted and located in the leads.

Dynamic monitoring instrumentation, including all gages and cables, shall not be installed on the pile until the pile has been lifted and aligned in the leads and the hammer and helmet have been properly set.

The Dynamic Testing Consultant shall perform dynamic testing during the entire initial drive and restrike of all piles so designated on the Plans or as otherwise directed by the Engineer or The Department. The dynamic testing firm shall continuously monitor the tensile and compressive stresses during driving to ensure that the permissible stress limits provided by the Engineer are not exceeded during driving. Should the driving operation result in stresses that approach or exceed the permissible limits, the dynamic testing firm's

equipment operator shall immediately have the hammer stroke reduced or the driving operation stopped in order to prevent pile damage. If non-axial driving is indicated by dynamic test measurements, pile driving shall be stopped immediately and the Contractor shall realign the driving system or take other corrective action, as necessary, before resuming driving.

If the top of pile is damaged or becomes deformed at any time during the dynamic testing of the piles, pile driving shall be stopped and the damaged area cut off in accordance with Section 619 of the Standard Specifications. The remaining pile section shall be properly prepared for gauge installation and inspected by the Department prior to the continuation of driving.

All dynamically tested piles shall be driven in accordance with the Plans. Should the field data indicate the hammer system is not transferring to the pile the full energy anticipated at the end of initial drive, the Contractor shall increase the hammer stroke and/or driving resistance until the minimum initial drive capacity is displayed on the dynamic testing apparatus. However, in no case shall the permissible stress limits be exceeded.

The Contractor shall maintain a minimum distance of 1-foot between the pile monitoring gages and the ground surface, water surface, or pile template. If additional ground penetration is required, the driving shall be halted, the gages removed and the pile spliced before proceeding with additional driving and monitoring. Prior to splicing, the pile splice segment shall be properly prepared for gage installation in accordance with ASTM D4945 and made accessible to the Department for inspection. After the pile has been properly spliced and the hammer and leads have been reset, the gages shall be reattached to the new pile segment and the drive continued.

Restriking of all test piles as indicated on the plans or directed by the Department shall be dynamically tested by the Contractor. Dynamic testing of production piles shall be at the request of the Department based on actual field conditions.

**Method of Measurement:**

High-Strain Dynamic Pile Testing by Contractor authorized and found acceptable by the Department will be measured on an Each basis upon receipt and acceptance of the associated dynamic testing report(s). Each initial drive and each restrike dynamically monitored by the Contractor shall be measured as separate units.

Signal Matching Analysis will be measured for at the Contract unit price per each.

**Basis of Payment:**

Payment for High-Strain Dynamic Pile Testing by Contractor authorized and found acceptable by the Department will be made at the Contract unit price per Each for Item 619519. Payment for Signal Matching Analysis by Contractor and found acceptable by the Engineer will be made at the Contract unit price per Each for Item 619539. The payment will also be full compensation for preparing the preconstruction wave equation analyses, and preparation of reports.

Price and Payment will constitute full compensation for furnishing tools, labor, specialty subcontractor, materials, equipment, analyses, reports, and incidental work required to perform high-strain dynamic pile testing during initial driving and restrikes including providing inspection access to the Engineer and the Department.

7/25/12

**712531 - CHANNEL BED FILL**

**Description:**

Furnish and place Channel Bed Fill to the limits specified in the construction plan set.

**Materials:**

Provide aggregate material meeting the following requirements:

Provide natural, rounded, unwashed and uncrushed aggregate material meeting the gradation of Table 1 when tested in accordance with AASHTO T-11 and T-27.

- a. Aggregate material meeting this requirement may be located within the excavation area of the project. The Contractor may salvage this material at his/her discretion by separating and stockpiling the material meeting the requirements of Table 1 and Notes 1&2.
- b. Angular quarried aggregate is unacceptable.
- c. The cost of salvaging and stockpiling existing material and removing excess stockpiled material is incidental to 712531 - Channel Bed Fill.

**Table 1**

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

**Notes:**

<sup>1</sup> Salvaged materials may contain material exceeding this size and be acceptable.

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

<sup>3</sup> Unless noted otherwise on plan sheets, Light gradation shall be used in locations in Sussex County

<sup>4</sup> Unless noted otherwise on plan sheets, Medium gradation shall be used in locations in Kent and New Castle Counties.

**Method of Measurement:**

Quantity of Channel Bed Fill will be measured by cubic yards of material acceptably placed.

**Basis of Payment:**

The quantity of Channel Bed Fill will be paid for at the Contract unit price per cubic yard. Price and Payment will constitute full compensation for all labor, equipment, and other incidentals required to salvage, stockpile, maintain, furnish, haul, place, and remove and dispose of all material necessary to complete the work.

5/12/16

**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 25:1 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.

8/12/2013

- 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**

	<b>WHITE:</b>	<b>YELLOW:</b>
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<sub>2</sub> (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  $73 \pm 5^\circ\text{F}$ . ( $23 \pm 3^\circ\text{C}$ ).

- a. Color. The white epoxy composition when applied at a minimum wet film thickness of  $20 \pm 1$  mils ( $500 \mu\text{m}$ ) 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 ( $500 \mu\text{m}$ ) 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  $\mu\text{m}$ ) 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  $20 \pm 1$  mils (500 or 625  $\mu\text{m}$ ) 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 [ $0.125 \pm 0.010$ " ( $3.18 \pm 0.25$  mm) thick]. Tests shall be conducted at an ambient temperature of  $75 \pm 5^\circ\text{F}$  ( $24 \pm 3^\circ\text{C}$ ). 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 polytetrafluorethylene (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  $75 \pm 5^{\circ}\text{F}$  ( $24 \pm 3^{\circ}\text{C}$ ).

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,<sup>(1)</sup> 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  $1" \pm 0.002"$  ( $25 \text{ mm} \pm 0.05 \text{ mm}$ ).

- 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  $77^{\circ}\text{F}$  ( $25^{\circ}\text{C}$ ).

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 ( $850 \mu\text{m}$  to  $600 \mu\text{m}$ ) 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>U.S. Standard Sieve</u>	<u>% Retained</u>	<u>% Passing</u>
#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>U.S. Standard Sieve</u>	<u>% Retained</u>	<u>% Passing</u>
#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:

<u>Composition:</u>	<u>Component</u>	<u>Percent By Weight</u>
	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:

<u>Sieve Size</u>	<u>Percent Retained</u>
#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.

<u>Hardness:</u>	The black aggregate hardness shall be 6.5-7 on Moh's Mineral Scale.
<u>Porosity:</u>	The black aggregate porosity shall be less than two (2) percent.
<u>Moisture Content:</u>	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 -White Edge lines on Portland cement concrete pavements shall have a 3 inch black contrast line running parallel to the white edge line. The contrast line shall be to the inside or travel lane side of the edge line. The black contrast marking is to be applied with a single drop of graded black aggregate. Once it has cured sufficiently so as not to track, the reflectorized white line is to be applied along side of the contrast line and the two lines shall adjoin each other.

Dotted Line: All dotted 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 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 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  $\mu$ m) 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-stripping over the cleaned surface, in accordance with the requirements of this specification and at a full 20+1 mils (500  $\mu$ m) 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.

8/7/2013

**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, 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 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.

5/21/2013

**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 or other type of pole 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 Delaware MUTCD or as directed by the Engineer. The Contractor shall be responsible for obtaining all necessary utility clearances before the signs may be installed. Signs and plaques shall be mounted no lower than the minimum mounting height specified in the Delaware MUTCD. Signs and plaques shall be mounted no higher than one foot above the minimum mounting height specified in the Delaware MUTCD. Any excess sign post protruding above the top of the top sign shall be cut off and removed. For sign removals, the sign posts shall have all nuts, bolts, and other connectors removed. The disturbed ground shall be graded and backfilled accordingly. The Contractor is responsible for disposal of all signing material removed from the project

**Method of Measurement:**

The number of single sign installations or removals will be measured as the actual number of signs 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 Delaware MUTCD or signs installed in the incorrect location shall be moved at no additional cost to the Department.

5/28/2013

**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  $[3\text{mm}+2\text{ppm}\times D]$  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. The Contractor may utilize GPS equipment to perform the excavation and embankment for the project as indicated on the plans. Use of this procedure and equipment is intended for grading the subgrade surface only; it is not intended for use in constructing final surface grades. GPS technology and machine control technology shall not be used in the construction of bridge or structures such as, but not limited to, curb, drainage inlets, manholes, junction boxes, pole bases and pipe inverts.

**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:
  - i. It is the intent of these provisions to alert the Contractor, that he/she shall not damage or destroy wetland areas, which exist beyond the construction limits. These provisions will be strictly enforced and the Contractor shall advise his/her personnel and those of any Subcontractor of the importance of these provisions.
  - ii. All clearing operations and delineation of wetlands areas shall be performed in accordance with these Special Provisions. Before any clearing operation commences the Contractor shall demarcate wetlands at the Limits of Construction throughout the entire project as shown on the Plans labeled as Limits of Construction or Wetland Delineation to the satisfaction of the Engineer.
  - iii. The material to be used for flagging the limits of construction shall be orange vinyl material with the wording "Wetland Boundary" printed thereon. In wooded areas, the flagging shall be tied on the trees, at approximate 20-foot (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.
  - iv. If the flagging has been destroyed and the Engineer determines that its use is still required, the Contractor shall reflag the area at no cost to the Department. If the Contractor, after notification by the Engineer that replacement flagging is needed, does not replace the destroyed flagging within 48 hours, the Engineer may proceed to have the area reflagged. The cost of the reflagging by the Engineer will be charged to the Contractor and deducted from any monies due under the Contract.
  - v. At the completion of construction, the Contractor shall remove all stakes and flagging.
  - vi. The Contractor shall be responsible for any damages to wetlands located beyond the construction limits, which occurs from his/her operations during the life of the Contract. The Contractor shall restore all temporarily disturbed wetland areas to their preconstruction conditions. This includes

restoring bank elevations, streambed and wetland surface contours and wetlands vegetation disturbed or destroyed. The expense for this restoration shall be borne solely by the Contractor.

**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) A printout of horizontal control verification, as well as coordinates, differences and error of closure for all reestablished or temporary Control Points.
- (c) A printout of vertical control verification, with benchmark location elevation and differences from plan elevation.
- (d) Sketch of location of newly referenced horizontal control, with text printout of coordinates, method of reference and field notes associated with referencing control.
- (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.

6/11/2012



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

JENNIFER COHAN  
SECRETARY

## UTILITY STATEMENT

*September 15, 2015*

*REVISED: July 25, 2016*

**STATE CONTRACT #T201307101**

**F.A.P. #EBHOS-N501(01)**

**PROJECT ID#13-01501**

**BR. 1-567A ON N501 HAY ROAD OVER SHELLPOT CREEK,  
CITY OF WILMINGTON  
NEW CASTLE COUNTY**

The following utilities maintain facilities within the limits of this project:

**DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL  
CONTROL  
DELAWARE SOLID WASTE AUTHORITY  
DELMARVA POWER – ELECTRIC DISTRIBUTION  
DELMARVA POWER - GAS  
VERIZON DELAWARE INC.**

Utility adjustments and/or relocations shall be performed as narrated, but are not limited to the following:

### **DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL (DNREC)**

DNREC maintains a camera and two pedestals within the limits of the project.

- DNREC proposed to remove the two (2) pedestals and camera located at STA 27+25 and STA 29+65 on the west side (left of the construction alignment). They will be replaced once the bridge project is complete.

DNREC expects to take approximately 1 calendar day for the removal and 1 calendar to reinstall their equipment. Prior to the State Contractor beginning work, the contractor shall contact DNREC a minimum of 7 calendar days in advance notice that work shall begin.

### **DELAWARE SOLID WASTE AUTHORITY (DSWA)**

DSWA maintains the following gas facilities within the limits of the project.

1. A 6" gas main runs along the east side (right side of the construction alignment) of the roadway underneath the travel lane from STA 27+50 to STA 29+59 where the main

bends to begin hanging onto the bridge. The main continues to STA 31+42 where it turns east into the existing easement.

2. 12" gas main enters in the roadway at approximately STA 29+10 from the gravel lane on the west side of the roadway (left of the construction alignment) and runs along the east side (right side of the construction alignment) of the roadway underneath the travel lane to STA 29+59 where the main bends to begin hanging onto the bridge. The main continues to STA 31+42 where it turns east into the existing easement.

DSWA proposed the following adjustments and/or relocations to its existing facilities:

1. The state's contractor will relocate the 12" gas main from STA 29+25 to STA 31+40 on the left hand side of the construction alignment in accordance with DSWA's specifications and relocation design. The 12" gas main, installed within steel casing pipe when above ground, will be attached to the outside of the bridge across Shellpot Creek. The existing 12" gas main will be cut, cap, and abandoned in place except for the 12" pipe that is attached to the bridge. The state's contractor shall remove this portion and discard.
2. The state's contractor will relocate the 6" gas main from STA 27+66 to STA 31+40 on the right hand side of the construction alignment in accordance with DSWA's specifications and relocation design. The 6" gas main, installed within steel casing pipe when above ground, will be attached to the outside of the bridge across Shellpot Creek. The existing 6" gas main will be cut, cap, and abandoned in place except for the 6" pipe that is attached to the bridge. The state's contractor shall remove this portion and discard.

### **DELMARVA POWER – ELECTRIC DISTRIBUTION**

Delmarva Power maintains aerial facilities within the limits of the project with no apparent conflicts.

Delmarva Power Distribution maintains three phase, 12kV, aerial circuits on Verizon owned poles within the limits of this project on Hay Road over Shellpot.

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.***

Any additional relocations/adjustments to any existing electric lines/poles shall be arranged, if necessary, with the owners during the construction of the project. The time to complete any relocations/adjustments will depend on the nature of the work.

No existing electric facilities can be taken out of service.

### **DELMARVA POWER (GAS)**

Delmarva Power - gas maintains facilities within the limits of the project with project with no apparent conflicts.

Any relocations/adjustments to any existing gas lines shall be arranged, if necessary, with the owners during the construction of the project. The time to complete any additional relocations/adjustments will depend on the nature of the work.

No existing gas facilities can be taken out of service.

### **VERIZON DELAWARE INC.**

Verizon maintains aerial facilities within the project limits with no apparent conflicts.

The State's Contractor shall contact Verizon prior to the start of construction to discuss the existing overhead facilities and any adjustment that will be required throughout this project.

Any additional relocations/adjustments to any existing aerial/underground lines or poles shall be arranged, if necessary, with the owners during the construction of the project. The time to complete any additional relocations/adjustments will depend on the nature of the work.

No existing Verizon facilities can be taken out of service.

### **General Notes:**

1. The Contractor's attention is directed to Section 105.09 Utilities, Delaware Standard Specifications, August 2001. The Contractor shall contact Miss Utility (1-800-282-8555) two working days prior to any excavation. The Contractor is responsible for the support and protection of all utilities when excavating. The Contractor is responsible for ensuring proper clearances, including safety clearances, from overhead utilities for construction equipment. The Contractor is advised to check the site for access purposes for his equipment and, if necessary, make arrangements directly with the utility companies for field adjustments for adequate clearances.
2. The information shown in the Contract Documents, including the Utility Statement and the Utility Schedule contained herein, concerning the location, type and size of existing and proposed utilities, their locations, and construction timing has been compiled by the preparer based on information furnished by each of the involved Utility Companies. It shall be the responsibility of the State's Contractor to verify all information and coordinate with the Utility Companies prior to and during construction, as specified in Section 105.09 of the Standard Specifications.
3. It is understood and agreed that the Contractor has considered in his bid all permanent and temporary utility appurtenances in their present and relocated positions as shown on the plans or described in the Utility Statement or are readily discernible and that no additional compensation will be allowed for any delays, inconvenience, or damage due to any interference from the utility facilities and appurtenances or the operation of moving them, except that the Contractor may be granted an equitable extension of time.
4. Coordination and cooperation among the Utility Companies and the State's Contractor are of prime importance. Therefore, the Contractor is directed to contact the following Utility Company representatives with any questions regarding this work prior to submitting bids and work schedules. Proposed work schedules should reflect the Utility Companies' proposed relocations. The Utility Companies do not work on weekends or legal holidays.

5. As outlined in Chapter 3 of the DelDOT Utilities Manual, individual utility companies are responsible for obtaining all required permits from municipal, State and federal government agencies and railroads. This includes but is not limited to water quality permits/DNREC Water Quality Certification, DNREC Subaqueous Lands/Wetlands permits, DNREC Coastal Zone Consistency Certification, County Floodplain permits (New Castle County only), U.S. Coast Guard permits, US Army Corps 404 permits, sediment and erosion permits, and railroad crossing permits.
6. Utility companies are required to restore any areas disturbed in conjunction with their relocation work. If an area is disturbed by a utility company and is not properly restored, the Department may have the highway contractor perform the necessary restoration. Any additional costs incurred as a result will be forwarded to the utility company.
7. Individual utility companies are required to restore any areas disturbed in conjunction with their relocation work. If an area is disturbed by a utility company and is not properly restored, the Department may have the highway contractor perform the necessary restoration. Any additional costs incurred as a result will be forwarded to the utility company.

<b>Matthew Chamberlain</b>	<b>DNREC</b>	<b>(800) 662-8802</b>
<b>Nicole Burkhardt</b>	<b>Delaware Solid Waste Authority</b>	<b>(302) 764-5385</b>
<b>Matthew Savage</b>	<b>Delmarva Power-Transmission Dept.</b>	<b>(302) 454-5174</b>
<b>Angel Collazo</b>	<b>Delmarva Power – Electric Distribution</b>	<b>(302) 454-4370</b>
<b>Ted Waugh</b>	<b>Delmarva Power – Gas</b>	<b>(302) 429-3706</b>
<b>George Zang</b>	<b>Verizon Delaware, Inc.</b>	<b>(302) 422-1238</b>

**DIVISION OF TRANSPORTATION SOLUTIONS**

*Deborah L. Kukulich*  
**UTILITY COORDINATOR**

*July 25, 2016*  
**DATE**

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

CERTIFICATE OF RIGHT-OF-WAY STATUS

STATE PROJECT NO. T201307101

F.A.P. NO. EBROS-N501(01)

BR 1-576 ON N501 HAY ROAD OVER SHELLPOT CREEK,  
CITY OF WILMINGTON

NEW CASTLE COUNTY

Certificate of Right-of-Way Status – 100%

Status - LEVEL 1

**As required by 23 CFR, Part 635, and other pertinent Federal and State regulations or laws, the following certifications are hereby made in reference to this highway project:**

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

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

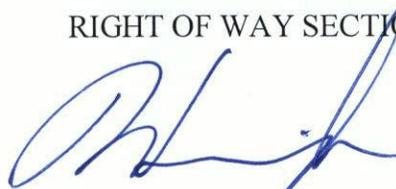
All project rights of way are currently available in accordance with the project right-of-way plans; and,

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

All occupants have vacated the lands and improvements; and,

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

RIGHT OF WAY SECTION



Robert Cunningham  
Chief of Right of Way

July 7, 2016



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

JENNIFER COHAN  
SECRETARY

August 3, 2016

**STIPULATED**

**ENVIRONMENTAL REQUIREMENTS**

FOR

State Contract No. T201307101

Federal Aid No.: EBROS-N501(01)

Contract Title: BR 1-567A on N501 Hay Road over Shellpot Creek, City of Wilmington

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. As such, a Categorical Exclusion has been prepared to evaluate potential adverse impacts resulting from construction of the proposed project (per 23 CFR 771.117 d(3)), and the following special provisions have been developed to mitigate and/or minimize these impacts.

**PERMIT REQUIREMENTS:**

The construction work that will occur to place scour countermeasures at BR 1-393 on SR 299 in Odessa, New Castle County, Delaware requires permit approval from the agencies listed below. It is the responsibility of the contracting agency -- the Delaware Department of Transportation, Division of Transportation Solutions -- to obtain the necessary permits to ensure that the contractor complies with the requirements and conditions established by the regulatory agencies. The permit coordination for this project is ongoing. Written authorization from the permitting agencies is required and paperwork for on-site posting is anticipated. As such, the construction work that will occur to place scour countermeasures at BR 1-393 on SR 299 in Odessa, New Castle County, Delaware will be authorized under the permits listed below:

## REQUIRED PERMITS AND APPROVAL STATUS:

- U.S. Army Corps of Engineers (COE) - Nationwide Permit (NWP) # 3 No Preconstruction Notification (PCN) is required – **FYI sent 7/25/16 – permit expires 3/17/17**
  - Please note that if the project is not under contract/construction before the expiration date, the permit cannot be extended and re-application will be necessary. If the project is under contract/construction before this date, all work in jurisdictional waters/wetlands must be completed by **3/18/18**.
- Delaware Department of Natural Resources and Environmental Control (DNREC) – Wetlands and Subaqueous Lands Section – Subaqueous Lands Permit – **Pending**
- Delaware Department of Natural Resources and Environmental Control (DNREC) – Water Quality (WQC) and Coastal Zone Consistency (CZM) – **Issued** (project is not located in a Critical Resource Waters (CRW))
- City of Wilmington – Floodplain Approval – **Pending**

## SPECIFIC REQUIREMENTS:

Compliance with all requirements of the permits is the responsibility of the contractor, who will follow all special conditions or requirements as stated within those permits. The contractor will be subject to penalties, fines, and the risk of shut down as mandated by laws governing permitting agencies if such conditions and requirements are violated or ignored. Therefore, all special conditions, general requirements, and/or other required provisions specified within the permits must be followed. Those obligations are indicated or listed within the permit package, which can be obtained from the DelDOT Contract Administration Office.

Additional requirements by DelDOT not specified within the permits, but listed below, are also the responsibility of the contractor. Noncompliance with these requirements may result in shut down of the project at the contractor's expense.

1. The contractor shall employ measures during construction to prevent spills of fuels or lubricants. If a spill should occur, efforts shall be undertaken to prevent its entry into wetlands, aquatic, or drainage areas. Any spills entering wetlands, aquatic, or drainage areas shall be removed immediately. The Division of Water Resources (DNREC), Wetlands & Aquatic Protection Branch, 302-739-4691, shall be notified of any spill(s) within six (6) hours of their occurrence. That office will determine the effectiveness of spill and contamination removal and specify remediation efforts as necessary.

2. All construction debris, excavated material, brush, rocks, and refuse incidental to the work shall be placed either on shore above the influence of flood waters or on some suitable disposal site approved by the department.
3. The disposal of trees, brush, and other debris in any stream corridor, wetland surface water or any drainage ditch is prohibited.
4. There shall be no stockpiling of construction materials or temporary fills in wetlands or subaqueous lands unless otherwise specified on project plans and approved by permitting agencies that govern them. It is the contractor's responsibility to coordinate and secure those additional permits/amendments in deviating from the plan.
5. Construction debris shall be kept from entering adjacent waterways, wetlands, ground cover, or drainage areas. Any debris that enters these areas shall be removed immediately. Netting, mats, or establishing confined work areas in stages may be necessary to address these issues.
6. Refuse material resulting from routine maintenance of worker equipment and heavy machinery is prohibited from being disposed or deposited onto or into the ground. All used oils and filters must be recycled or disposed of properly.
7. Use of harmful chemical wash water to clean equipment or machinery is discouraged. If undertaken, the residue water and/or material must be collected or contained such that it will be disposed of properly. It shall not be deposited or disposed of in waterways, streams, wetlands, or drainage areas.
8. The contractor shall follow all requirements as indicated in the Environmental Compliance Sheet. It is the contractor's responsibility to ensure that workers also follow this requirement. As part of the restrictions, please note the timetables reflected in the contract for the in-stream/water work for endangered species protection.
9. Fill material shall be free of oil and grease, debris, wood, general refuse, plaster and other pollutants, and shall contain no broken asphalt.

#### ENVIRONMENTAL COMPLIANCE SHEET:

The contractor shall pay special attention to specific construction requirements as indicated in the Environmental Compliance Sheet (sheet 31-32).

1. Specifically, please note the environmental requirements as indicated in the following notes:
  - Note 2B Migratory Birds protected under the Migratory Bird Treaty Act (MBTA) nest underneath BR 1-567A – work must be avoided from April 15 to August 1 (inclusive). Either begin work on the underside of the structure prior to April 15 (to

prevent birds from nesting) or wait until after August 1 (after hatchlings have left) to begin work on the underside. IF neither of these options is practicable, then deterrent netting or similar device shall be installed prior to April 15.

- Note 3 – Cultural Resources
  - Note 4 – Stream Restoration and Riprap Treatments
  - Note 5 – Protection of Resources
  - Note 6 – Planting
  - Note 7 – No permanent sediment, riprap or other fill material shall be placed in the existing concrete channel located between 31+90 to 34+60 right.
2. DelDOT Environmental Studies Section (302) 760-2264 must be notified if there are any changes to the project methods, footprint, materials, or designs, to allow the Department to coordinate with the appropriate resource agencies (COE, DNREC, and SHPO), for approval.



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

JENNIFER COHAN  
 SECRETARY

**RAILROAD STATEMENT**

For

**State Contract No.:** T201307101

**Federal Aid No.:**

**Project Title:** BR 1-567A on Hay Road

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

- |  |   |
|--|---|
| <input type="checkbox"/> Amtrak              | <input type="checkbox"/> Maryland & Delaware  |
| <input type="checkbox"/> CSX                 | <input type="checkbox"/> Norfolk Southern     |
| <input type="checkbox"/> Delaware Coast Line | <input type="checkbox"/> Wilmington & Western |
| <input type="checkbox"/> East Penn           | <input checked="" type="checkbox"/> None      |

DOT Inventory No.:

No. Trains/Day:

Passenger Trains (Y / N):

**In accordance with 23 CFR 635, herein is the railroad statement of coordination (check one):**

- No Railroad involvement.
  
- Railroad Agreement unnecessary but railroad flagging required. The contractor shall follow requirements stated in the DeIDOT Maintenance of Railroad Traffic Item in the Special Provisions. Contractor shall coordinate railroad flagging with DeIDOT's Railroad Program Manager at (302) 760-2183.
  
- Railroad Agreement required. The necessary railroad agreement, attached, is complete and fully executed. Railroad related work to be undertaken and completed as required for proper coordination with physical construction schedules. The Contractor shall follow requirements stated in the DeIDOT Maintenance of Railroad Traffic Item in the Special Provisions. Contractor shall coordinate railroad flagging with DeIDOT's Railroad Program Manager at (302) 760-2183.

**Approved As To Form:**

  
 \_\_\_\_\_  
 Robert A. Perrine  
 DeIDOT Railroad Program Manager

1/25/16  
 \_\_\_\_\_  
 DATE

**BID PROPOSAL FORMS**

CONTRACT   T201307101.01  

FEDERAL AID PROJECT   EBROS-N501(01)

CONTRACT ID: T201307101.01

PROJECT(S): EBROS-N501(01)

All figures must be typewritten.

CONTRACTOR : \_\_\_\_\_

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS

SECTION 0001 BRIDGE AND ROADWAY WORK

0010	201000 CLEARING AND GRUBBING	LUMP		LUMP		
0020	202000 EXCAVATION AND EMBANKMENT	CY	2500.000			
0030	202505 SETTLEMENT PLATFORM	EACH	2.000			
0040	207000 EXCAVATION AND BACKFILL FOR STRUCTURES	CY	200.000			
0050	207500 COFFERDAMS	LUMP		LUMP		
0060	209001 BORROW, TYPE A	CY	1000.000			
0070	209002 BORROW, TYPE B	CY	20.000			
0080	209006 BORROW, TYPE F	CY	370.000			
0090	210000 FURNISHING BORROW TYPE "C" FOR PIPE, UTILITY TRENCH, AND STRUCTURE BACKFILL	CY	45.000			

CONTRACT ID: T201307101.01

PROJECT(S): EBROS-N501(01)

All figures must be typewritten.

CONTRACTOR :

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0100	211000 REMOVAL OF STRUCTURES AND OBSTRUCTIONS	LUMP	LUMP			
0110	302007 GRADED AGGREGATE BASE COURSE, TYPE B	CY	483.000			
0120	302011 DELAWARE NO. 3 STONE	TON	165.000			
0130	401807 BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 76-22 (CARBONATE STONE)	TON	250.000			
0140	401816 BITUMINOUS CONCRETE, SUPERPAVE, TYPE B, 160 GYRATIONS, PG 76-22	TON	361.000			
0150	401819 BITUMINOUS CONCRETE, SUPERPAVE, BITUMINOUS CONCRETE BASE COURSE, 160 GYRATIONS, PG 64-22	TON	475.000			
0160	601520 TEMPORARY TIMBER MAT	LUMP	LUMP			
0170	602007 PORTLAND CEMENT CONCRETE MASONRY, PIER ABOVE FOOTING, CLASS A	CY	28.000			
0180	602013 PORTLAND CEMENT CONCRETE MASONRY, SUPERSTRUCTURE, CLASS D	CY	123.000			

CONTRACT ID: T201307101.01 PROJECT(S): EBROS-N501(01)

All figures must be typewritten.

CONTRACTOR :

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0190	602014 PORTLAND CEMENT CONCRETE MASONRY, APPROACH SLAB, CLASS D	96.000 CY				
0200	602015 PORTLAND CEMENT CONCRETE MASONRY, ABUTMENT ABOVE FOOTING, CLASS A	67.000 CY				
0210	602017 PORTLAND CEMENT CONCRETE MASONRY, PARAPET, CLASS A	33.000 CY				
0220	602520 EPOXY PROTECTIVE COATING FOR CONCRETE	47.000 SY				
0230	602616 WATERPROOFING P.C. C. MASONRY SURFACES	257.000 SF				
0240	602646 SILICONE ACRYLIC CONCRETE SEALER	4062.000 SF				
0250	604000 BAR REINFORCEMENT, EPOXY COATED	68000.000 LB				
0260	608000 COARSE AGGREGATE FOR FOUNDATION STABILIZATION AND SUBFOUNDATION BACKFILL	106.000 TON				
0270	614505 LANDFILL GAS CONVEYANCE FACILITY	LUMP		LUMP		

CONTRACT ID: T201307101.01

PROJECT(S): EBROS-N501(01)

All figures must be typewritten.

CONTRACTOR : \_\_\_\_\_

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0280	618082 FURNISH PRECAST PRESTRESSED CONCRETE PILE, 16" X 16"	LF 616.000				
0290	618083 FURNISH PRECAST PRESTRESSED CONCRETE PILE, 18" X 18"	LF 518.000				
0300	618092 FURNISH PRECAST PRESTRESSED CONCRETE TEST PILE, 16" X 16"	LF 108.000				
0310	618093 FURNISH PRECAST PRESTRESSED CONCRETE TEST PILE, 18" X 18"	LF 84.000				
0320	619062 INSTALL PRECAST PRESTRESSED CONCRETE PILE, 16" X 16"	LF 616.000				
0330	619063 INSTALL PRECAST PRESTRESSED CONCRETE PILE, 18" X 18"	LF 518.000				
0340	619068 INSTALL PRECAST PRESTRESSED CONCRETE TEST PILE, 16" X 16"	LF 108.000				
0350	619069 INSTALL PRECAST PRESTRESSED CONCRETE TEST PILE, 18" X 18"	LF 84.000				
0360	619502 TEST PILE RESTRIKE	EADY 3.000				
0370	619519 DYNAMIC PILE TESTING BY CONTRACTOR	EACH 9.000				

CONTRACT ID: T201307101.01 PROJECT(S): EBROS-N501(01)

All figures must be typewritten.

CONTRACTOR : \_\_\_\_\_

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0380	623002 PRESTRESSED REINFORCED CONCRETE MEMBERS, BOX-BEAMS	LUMP	LUMP			
0390	710001 ADJUSTING AND REPAIRING EXISTING DRAINAGE INLET	EACH	1.000			
0400	712021 RIPRAP, R-5	TON	265.000			
0410	712531 CHANNEL BED FILL	CY	110.000			
0420	713003 GEOTEXTILES, RIPRAP	SY	670.000			
0430	720050 GALVANIZED STEEL BEAM GUARDRAIL, TYPE 1-31	LF	203.000			
0440	720055 CURVED GUARDRAIL SECTION	LF	100.000			
0450	720585 GUARDRAIL END TREATMENT ATTENUATOR, TYPE 1-31	EACH	1.000			
0460	725002 GUARDRAIL TO BARRIER CONNECTION, APPROACH TYPE 1-31	EACH	3.000			
0470	726001 END ANCHORAGE 31	EACH	2.000			

CONTRACT ID: T201307101.01

PROJECT(S): EBROS-N501(01)

All figures must be typewritten.

CONTRACTOR : \_\_\_\_\_

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0480	743000 MAINTENANCE OF TRAFFIC	LUMP	LUMP			
0490	743004 FURNISH AND MAINTAIN PORTABLE CHANGEABLE MESSAGE SIGN	EADY	60.000			
0500	743006 PLASTIC DRUMS	EADY	6586.000			
0510	743023 TEMPORARY BARRICADES, TYPE III	LFDY	12000.000			
0520	743024 TEMPORARY WARNING SIGNS AND PLAQUES	EADY	8082.000			
0530	743056 FLAGGER, NEW CASTLE COUNTY, FEDERAL	HOUR	125.000			
0540	743065 FLAGGER, NEW CASTLE COUNTY, FEDERAL, OVERTIME	HOUR	13.000			
0550	748530 REMOVAL OF PAVEMENT STRIPING	SF	430.000			
0560	748548 PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 5"	LF	2614.000			
0570	749687 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE SIGN POST	EACH	8.000			

CONTRACT ID: T201307101.01 PROJECT(S): EBROS-N501(01)

All figures must be typewritten.

CONTRACTOR : \_\_\_\_\_

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0580	759006 FIELD OFFICE, TYPE III	10.000 EAMO				
0590	762001 SAW CUTTING, BITUMINOUS CONCRETE	454.000 LF				
0600	763000 INITIAL EXPENSE	LUMP	LUMP			
0610	763501 CONSTRUCTION ENGINEERING	LUMP	LUMP			
0620	905001 SILT FENCE	680.000 LF				
0630	905004 INLET SEDIMENT CONTROL, DRAINAGE INLET	1.000 EACH				
0640	905006 INLET SEDIMENT CONTROL, CULVERT INLET	1.000 EACH				
0650	906001 PORTABLE SEDIMENT TANK	1.000 EACH				
0660	906003 SUMP PIT	2.000 EACH				
0670	908004 TOPSOIL, 6" DEPTH	1435.000 SY				

CONTRACT ID: T201307101.01 PROJECT(S): EBROS-N501(01)

All figures must be typewritten.

CONTRACTOR : \_\_\_\_\_

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0680	908014 PERMANENT GRASS SEEDING, DRY GROUND	1251.000 SY				
0690	908017 TEMPORARY GRASS SEEDING	1251.000 SY				
0700	908019 STREAMBANK SEED MIX, SEEDING	184.000 SY				
0710	908020 EROSION CONTROL BLANKET MULCH	184.000 SY				
0720	909004 TURBIDITY CURTAIN, FLOATING	300.000 LF				
	SECTION 0001 TOTAL					
	TOTAL BID					

CANNOT BE USED FOR BIDDING

**AFFIDAVIT  
OF  
EMPLOYEE DRUG TESTING PROGRAM**

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

**Contractor/Subcontractor Name:** \_\_\_\_\_

**Contractor/Subcontractor Address:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Authorized Representative (typed or printed):** \_\_\_\_\_

**Authorized Representative (signature):** \_\_\_\_\_

**Title:** \_\_\_\_\_

Sworn to and Subscribed before me this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_.

My Commission expires \_\_\_\_\_. NOTARY PUBLIC \_\_\_\_\_.

**THIS PAGE MUST BE SIGNED AND NOTARIZED AND RETURNED WITH YOUR BID.**

**CERTIFICATION**

Contract No. T201307101.01  
Federal Aid Project No. EBROS-N501(01)

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.

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 prosecution or administrative sanctions.

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(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
<hr/> <b>BIDDERS MUST ACKNOWLEDGE RECEIPT OF ALL ADDENDA</b> <hr/>									
<b>MUST INSERT DATE OF FINAL QUESTIONS AND ANSWERS ON WEBSITE:</b> _____ 									

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. T201307101.01, 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\_\_ ).

SEALED, AND DELIVERED IN THE  
presence of

\_\_\_\_\_  
Name of Bidder (Organization)

Corporate  
Seal

By: \_\_\_\_\_  
Authorized Signature

Attest \_\_\_\_\_

\_\_\_\_\_  
Title

\_\_\_\_\_  
Name of **Surety**

Witness: \_\_\_\_\_

By: \_\_\_\_\_

\_\_\_\_\_  
Title