STATE OF DELAWARE

This Copy is for information only.
You must request a CD from
DelDOT in order to bid.

DEPARTMENT OF TRANSPORTATION

BID PROPOSAL

for

CONTRACT T201407601.01

FEDERAL AID PROJECT NO. EBHOS-S013(02)

CFDA NO. 20.205

BR 3-152 Central Ave. & BR 3-161 Poplar St. Over Broad Creek

Sussex County

ADVERTISEMENT DATE: October 9, 2017

COMPLETION TIME: 327 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 **November 14, 2017**

Contract No.T201407601.01
Federal Aid Project No. EBHOS-S013(02)

BR 3-152 Central Ave. & BR 3-161 Poplar St. Over Broad Creek
Sussex County

GENERAL DESCRIPTION

LOCATION

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

DESCRIPTION

The improvements consist of furnishing all labor and materials for this contract. This project involves the rehabilitation of Bridges 3 -152 and 3 -161 in downtown Laurel. Some of the work for Bridge 3-152 includes replacement of the main steel superstructure with concrete beams with a concrete deck. The new beams will sit on a new abutment constructed behind the existing abutment, rehabilitated pier, and a built-up abutment. The existing counterweight and steel girders will remain in place to maintain the bridge's historic character. Some of the work for Bridge 3-161 includes painting the existing steel and repairs to the pier and abutment to fix the bridge permanently. Both bridges will be closed during construction, although not at the same time. Both bridges will be fixed in place after construction 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 327 Calendar Days. The Contract Time includes an allowance for 49 Weather Days. It is the Department's intent to issue a Notice to Proceed such that work starts on or after January 27, 2018.

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, or (302) 760-2031. 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 November 14, 2017 unless changed via addendum.
2. QUESTIONS regarding this project are to be e-mailed to 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 T201407601.01 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. DBE PROGRAM REQUIREMENTS under 49CFR §26.53(b)(3)(i)(B) change effective January 1, 2017. **Submission of DBE participation information is now required from the lowest apparent bidder no later than five (5) calendar days after bid opening *(formerly 7 days)*.**
8. No RETAINAGE will be withheld on this contract.
9. 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.

CONSTRUCTION ITEMS UNITS OF MEASURE

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

*Not used for units of measurement for payment.

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GENERAL NOTICES

SPECIFICATIONS:

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

CLARIFICATIONS:

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

ATTESTING TO NON-COLLUSION:

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

QUANTITIES:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

CONFLICT WITH FEDERAL STATUTES OR REGULATIONS:

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

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

FEDERAL LABOR AND EMPLOYMENT REQUIREMENTS

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

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

CONVICT PRODUCED MATERIALS:

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

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

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

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

TO REPORT BID RIGGING ACTIVITIES:

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

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

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

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

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

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

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

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

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

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

4. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is Sussex 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, Kirbati, Juvalu, Nauru, Federated States of Micronesia, or Hong Kong;
(v) Subcontinent Asian Americans which includes persons whose origins are from India, Pakistan, Bangladesh, Bhutan, the Maldives Islands, Nepal or Sri Lanka;
(vi) Women;
(vii) Any additional groups whose members are designated as socially and economically disadvantaged by the SBA, at such time as the SBA designation becomes effective.

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

Disadvantaged Business Enterprise 11 % Percent

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

Bidders are required to submit with their bids the completed DBE Program Assurance portion of the Certification document which will state the bidders intent of meeting the goals established for this contract; or in the instance where a contractor cannot meet the assigned DBE Goals for this contract, he/she shall at the time of bid submit documentation required to verify that he/she has made a Good Faith Effort to meet the DBE Goals. Guidance for submitting a Good Faith Effort is identified in the next section and in the DBE

Program Plan. Further, the apparent low bidder must submit to DelDOT within five (5) calendar days after the bid opening, executed originals of each and every DBE subcontract to satisfy contract goals consistent with the DBE Program Assurance submitted as part of the bid package.

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

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

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

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CRITICAL DBE REQUIREMENTS

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

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

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

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 ithas made to obtain the information.
5. Sanctions for Noncompliance: In the event of a contractor's noncompliance with the Non-discrimination provisions of this contract, the Recipient will impose such contract sanctions as it or the Federal Highway Administration (FHWA), or Federal Transit Authority (FTA) may determine to be appropriate, including, but not limited to:
   withholding payments to the contractor under the contract until the contractor complies;
   and/or cancelling, terminating, or suspending a contract, in whole or in part.
6. Incorporation of Provisions: The contractor will include the provisions of paragraphs one through five in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts and the Regulations . The contractor will take action with respect to any subcontract or procurement as the Recipient or the Federal Highway Administration (FHWA), or Federal Transit Authority (FTA) may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

APPENDIX E

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

Pertinent Non-Discrimination Authorities:

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

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

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

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

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

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

The Civil Rights Restoration Act of 1987,(PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of l964,The AgeDiscrimination Act of 1975and Section 504 of the Rehabilitation Act of l973,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, 2017

CLASSIFICATION	NEW CASTLE	KENT	SUSSEX
BRICKLAYERS	51.99	51.99	15.17
CARPENTERS	53.48	53.81	42.77
CEMENT FINISHERS	33.91	34.12	27.13
ELECTRICAL LINE WORKERS	23.52	45.39	22.22
ELECTRICIANS	66.85	66.85	66.85
IRON WORKERS	62.35	24.95	26.50
LABORERS	43.30	39.85	39.12
MILLWRIGHTS	16.84	16.34	14.11
PAINTERS	67.07	67.07	67.07
PILEDRIVERS	69.44	24.83	28.17
POWER EQUIPMENT OPERATORS	42.91	41.41	37.92
SHEET METAL WORKERS	23.79	21.23	19.23
TRUCK DRIVERS	35.73	29.51	35.95

CERTIFIED: 9/14/17 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: T201407601.01 BR 3-153 Central Ave and BR 3-161Poplar St. Over Broad Creek , Sussex County

FEDERAL DAVIS-BACON WAGE RATES 01/06/2017 DE21

General Decision Number: DE170021

Superseded General Decision Number: DE20160021

STATE: Delaware

Construction Type: Highway

COUNTY: Sussex County in Delaware

HIGHWAY CONSTRUCTION PROJECTS

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.20 for calendar year 2017 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 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 $10.20 per hour (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 2017. 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.

Modification Number	Publication Date
0	01/06/2017

SUDE2016-003 04/23/2015

	Rates	Fringes
Bricklayer	14.98	
Carpenter	41.97	
Cement Mason/Concrete Finisher	26.79	
ELECTRICIAN		
Electrician	65.10	
Line Worker	21.94	
Ironworker	26.17	
Laborer	38.63	
Millwright	13.93	
Painter	63.14	
Power Equipment Operator:		
Piledriver	27.82	
Power Equipment Operators	29.07	
Sheet Metal Worker	18.99	
Truck Driver	35.50	

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

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any soliticitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is

ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (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/publications/manuals/standard_specifications/index.shtml

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.

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/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

302514 - MILLED HOT-MIX BASE COURSE

Description:

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

Materials:

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

Subgrade Preparation:

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

Placement:

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

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

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

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

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

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

   In no case shall vehicles be allowed to travel in a single track or to form ruts in the base course. If any sharp irregularities are formed int he subgrade or base course material, the affected area shall be scarified to a depth of 6" (150 mm) and compacted to conform to the requirements of Section 202 or this Section.

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

To determine the control strip target density, a control strip with a minimum length of 300' (90 m) shall be constructed at the beginning of work on each pavement base. Each control strip is to remain in place and become a section of the completed roadway. A control strip shall have an area of at least 400 yd^2 (325 m^2). 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 302005 - 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 302005 - Graded Aggregate Base Course, Type B. All costs to bring the millings into compliance with the requirements of 302514 are incidental to Item 302005. 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.

4/26/17

401699 - QUALITY CONTROL/QUALITY ASSURANCE OF BITUMINOUS CONCRETE

.01 Description

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

.02 Bituminous Concrete Production – Quality Acceptance

(a) Material Production - Tests and Evaluations.

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

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

The first sample of the production day will be randomly generated by the Engineer between loads 0 and 12 (0-250 tons). Subsequent samples will be randomly generated by the Engineer on 500-ton sub-lots for the production day. Samples not retrieved in accordance with the Contractor's QC plan will be deemed unacceptable and may be a basis for rejection of material produced. Parallel tests or dispute resolution tests will only be performed on material captured at the same time and location as the acceptance test sample. Parallel test samples or Dispute Resolution samples will be created by splitting a large sample or obtaining multiple samples that equally represent the material. The Engineer will perform all splitting and handling of material after it is obtained by the Contractor.

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

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

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

production. If the actual production is going to be 50 tons or greater over the anticipated sub lot production, a new sample location will be determined on a statistically random, unbiased basis based upon the new actual production. The Engineer will combine the evaluation and test results for all of the applicable sublots in order to evaluate each individual lot.

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

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

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

(b) Pavement Construction - Tests and Evaluations.

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

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

The exempt areas around manholes will be a maximum of 4 feet transversely on either side from the center of the manhole, and 20 feet longitudinally on either side from the center of the manhole. The exempt areas around driveway entrances shall be the entire width of the driveway, and 3 feet from the edge of the longitudinal joint next to the driveway. Areas of exemption that will be cored for informational purposes only include: areas where the mat thickness is less than three times the nominal maximum aggregate size as directed by the Engineer, violations of Section 401.08 in the Standard Specifications as directed by the Engineer, and areas shown to contain questionable subgrade properties as proven by substantial yielding under a fully legally loaded truck. Failure to obtain core samples in these areas will result in zero payment for compaction regardless of the exempt status. The Engineer will evaluate and accept the compaction work on a daily basis. Payment for the compaction will be calculated by using the material production lots as referenced in **.02 Acceptance Plan (a) Material Production - B Tests and Evaluation** and analyzing the compaction results over the individual days covered in the material production lot. The compaction results will be combined with the material results to obtain a payment for this item.

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

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

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

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

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

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

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

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

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

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

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

.03 Payment and Pay Adjustment Factors.

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

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

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

(a) Material Production - Pay Adjustment.

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

Table 2 - Material Parameter Weight Factors

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

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

1. For each parameter, calculate the mean value and the standard deviation of the test values for the lot to the nearest 0.1 unit.
2. For each parameter, calculate the Upper Quality Index (QU):
   QU = ((JMF target) + (single test tolerance) - (mean value)) / (standard deviation).
3. For each parameter, calculate the Lower Quality Index (QL):
   QL = ((mean value) - (JMF target) + (single test tolerance)) / (standard deviation).
4. For each parameter, locate the values for the Upper Payment Limit (PU) and the Lower Payment Limit (PL) from Table 3 - Quality Level Analysis by the Standard Deviation Method. (Use the column for "n" representing the number of sublots in the lot. Use the closest value on the table when the exact value is not listed).
5. Calculate the PWL for each parameter from the values located in the previous step:
   PWL = PU + PL - 100.
6. Calculate each parameter's contribution to the payment adjustment by multiplying its PWL by the weight factor shown in Table 2 for that parameter.
7. Add the calculated adjustments of all the parameters together to determine the Composite PWL for the lot.
8. From Table 4, locate the value of the Pay Adjustment Factor corresponding to the calculated PWL. When all properties of a single test are within the single test tolerance of Table 2, Pay Adjustment factors shall be determined by Column B. When any property of a single test is outside of the Single Test Tolerance parameters defined in Table 2, the Material Pay Adjustment factor shall be determined by Column C.
9. For each lot, determine the final material price adjustment:

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

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

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

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

If, during production, a QA sample test result does not meet the acceptable tolerances and the Contractors QC sample duplicates the QA sample test result, the Contractor can make an appropriate change to the mixture (within the JMF boundaries), and request to have that sample further isolated. After the Contractor has made appropriate changes, the Contractor will visually inspect each produced load. The first visually acceptable load will be sampled and tested. If that sample test result shows compliance with the specifications, the material that is considered out of the acceptable tolerance will include the material from the previous acceptable test result to the third load after the initially sampled and tested sample. If the sample does not meet the specification requirements, the Engineer will no longer accept material. Production may resume when changes have been made and an acceptable sample and test result is obtained.

Table 3 – Quality Level Analysis by the Standard Deviation Method

PU or PL	QU and QL for "n" Samples						
	n = 3	n = 4	n = 5	n = 6	n = 7	n = 8	n = 9
100	1.16	1.50	1.79	2.03	2.23	2.39	2.53
99	-	1.47	1.67	1.80	1.89	1.95	2.00
98	1.15	1.44	1.60	1.70	1.76	1.81	1.84
97	-	1.41	1.54	1.62	1.67	1.70	1.72
96	1.14	1.38	1.49	1.55	1.59	1.61	1.63
95	-	1.35	1.44	1.49	1.52	1.54	1.55
94	1.13	1.32	1.39	1.43	1.46	1.47	1.48
93	-	1.29	1.35	1.38	1.40	1.41	1.42
92	1.12	1.26	1.31	1.33	1.35	1.36	1.36
91	1.11	1.23	1.27	1.29	1.30	1.30	1.31
90	1.10	1.20	1.23	1.24	1.25	1.25	1.26
89	1.09	1.17	1.19	1.20	1.20	1.21	1.21
88	1.07	1.14	1.15	1.16	1.16	1.16	1.17
87	1.06	1.11	1.12	1.12	1.12	1.12	1.12
86	1.04	1.08	1.08	1.08	1.08	1.08	1.08
85	1.03	1.05	1.05	1.04	1.04	1.04	1.04

84	1.01	1.02	1.01	1.01	1.00	1.00	1.00
83	1.00	0.99	0.98	0.97	0.97	0.96	0.96
82	0.97	0.96	0.95	0.94	0.93	0.93	0.93
81	0.96	0.93	0.91	0.90	0.90	0.89	0.89
80	0.93	0.90	0.88	0.87	0.86	0.86	0.86
79	0.91	0.87	0.85	0.84	0.83	0.82	0.82
78	0.89	0.84	0.82	0.80	0.80	0.79	0.79
77	0.87	0.81	0.78	0.77	0.76	0.76	0.76
76	0.84	0.78	0.75	0.74	0.73	0.73	0.72
75	0.82	0.75	0.72	0.71	0.70	0.70	0.69
74	0.79	0.72	0.69	0.68	0.67	0.66	0.66
73	0.75	0.69	0.66	0.65	0.64	0.63	0.63
72	0.74	0.66	0.63	0.62	0.61	0.60	0.60
71	0.71	0.63	0.60	0.59	0.58	0.57	0.57
70	0.68	0.60	0.57	0.56	0.55	0.55	0.54
69	0.65	0.57	0.54	0.53	0.52	0.52	0.51
68	0.62	0.54	0.51	0.50	0.49	0.49	0.48
67	0.59	0.51	0.47	0.47	0.46	0.46	0.46
66	0.56	0.48	0.45	0.44	0.44	0.43	0.43
65	0.52	0.45	0.43	0.41	0.41	0.40	0.40
64	0.49	0.42	0.40	0.39	0.38	0.38	0.37
63	0.46	0.39	0.37	0.36	0.35	0.35	0.35
62	0.43	0.36	0.34	0.33	0.32	0.32	0.32

Table 3 – Quality Level Analysis by the Standard Deviation Method

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

Table 4 - PWL Pay Adjustment Factors

PWL	Pay Adjustment Factor (%) Column B	Pay Adjustment Factor (%) Column C
100	+5	0
99	+4	-1
98	+3	-2
97	+2	-3
96	+1	-4
95	0	-5
94	-1	-6
93	-2	-7

92	-3	-8
91	-4	-9
PWL<91	PWL - 100	PWL - 100

(b) Pavement Construction - Pay Adjustments.

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

- Degree of compaction of the in-place material

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

1. Calculate the core bulk specific gravity values from the sublot tests values, to the nearest 0.001 unit. Obtain the Theoretical maximum Specific Gravity values from the corresponding laboratory sublot tests.
2. Calculate the Degree of Compaction:
   Degree of Compaction =
   ((Core Bulk Specific Gravity) / (Theoretical Maximum Specific Gravity)) x 100% recorded to the nearest 0.1%.
3. The average compaction for the sublots shall be averaged together for the compaction level of the lot. The lots compaction test level shall be averaged and recorded to the nearest whole percent.
4. Locate the value of the Payment Adjustment Factor corresponding to the calculated degree of compaction from Table 5 or Table 5a.
5. Determine the pavement construction price adjustment by using the following formula:
   Construction Pay adjustment = (Lot Quantity) x (Bid Price) x (Pay Adjustment Factor) x 30%.

Table 5: Compaction Price Adjustment Highway Locations

Degree of Compaction (%)	Range	Pay Adjustment Factor (%)
>= 97.0	>= 96.75	-100*
96.5	96.26 – 96.74	-5
96.0	95.75 – 96.25	-3
95.5	95.26 – 95.74	-2
95.0	94.75 – 95.25	0
94.5	94.26 – 94.74	0
94.0	93.75 – 94.25	1
93.5	93.26 – 93.74	3
93.0	92.75 – 93.25	5
92.5	92.26 – 92.74	3
92.0	91.75 – 92.25	0

91.5	91.26 – 91.74	0
91.0	90.75 – 91.25	-5
90.5	90.26 – 90.74	-15
90.0	89.75 – 90.25	-20
89.5	89.26 – 89.74	-25
89.0	88.75 – 89.25	-30
88.5	88.26 – 88.74	-50
=<88.0	=<88.25	-100*

* or remove and replace it at Engineer's discretion

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

86.0	85.75 – 86.25	-25
85.5	85.26 – 85.74	-30
85.0	84.75 – 85.25	-40
84.5	84.26 – 84.74	-50
=< 84.0	=<84.25	-100*

* or remove and replace at Engineer's discretion

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

.04 Dispute Resolution.

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

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

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

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

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

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

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

Appendix A - Repairing Core Holes in Bituminous Asphalt Pavement

Description.

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

Materials and Equipment.

The following material shall be available to complete this work:

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

The following equipment shall be available to complete this work:

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

Construction Method.

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

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

Performance Requirements.

The Engineer will judge the patch on the following basis:

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

Basis of Payment.

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

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

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

1. Contact Materials & Research (M&R) personnel to determine if information about the area is already available. If M&R has already obtained cores in the location that is being investigated, the contractor may opt to use the laboratory information for the investigation and not core the area on their own.

2. If M&R does not have information concerning the section of the roadway, the contractor needs to contact M&R to arrange for verification of coring operations. Arrangements shall be made to allow for an individual from M&R to be on the site when the cores are obtained. Cores will be turned over to M&R for evaluation.

3. The Contractor is responsible for providing all traffic control and repairing core holes in accordance to 401699 Appendix A - Repairing Core Holes in Bituminous Asphalt Pavements.

4. Cores are to be taken throughout the entire project for the area in question. Cores will be spaced, from the start of the project in increments determined based on field and project specifics. Cores will be evenly distributed throughout the project location. The cores will be taken in the center of the lane in question.

5. Additional cores may be taken at other locations, if surface conditions indicate that there may be a substantial difference in the underlying section. The location of these cores should be documented and submitted to M&R.

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

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

Structural Number Calculations

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

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

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

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

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

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

Example:

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

Calculation:

For the Type B lift the calculation would be:

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

For the Type C lift the calculation would be:

Newly Placed B	2.25 * 0.4 =	0.90
Existing HMA	2 * 0.32 =	0.64
GABC	7* 0.14 =	0.98
		2.52

11/3/14

401752 – SAFETY EDGE FOR ROADWAY PAVEMENT

Description:

This work consists of the construction of safety edge(s) along bituminous concrete pavement or P.C.C. pavement in accordance with the details and notes on the Plans and as directed by the Engineer.

Construction Methods:

The safety edge shall not be constructed adjacent to curb or in front of guardrail sections.

In bituminous concrete pavement sections, prior to the construction of the safety edge, the fill or in situ material at the edge of pavement shall be compacted so that it is level with the top of the pavement, prior to the final surface overlay.

In bituminous concrete pavement sections, the contractor shall attach a device to the screed of the paver unit that confines the material at the end of the gate and extrudes the asphalt material in such a way that results in a compacted wedge shape pavement edge of 32 degrees (construction tolerance range of 26 to 40 degrees). Contact shall be maintained between the device and the road shoulder surface. The device shall be manufactured so that it can be easily adjusted to transition at cross roads, driveways and obstructions without stopping the paver unit. The device's shape shall constrain the asphalt and cause compaction, as well as increase the density of the extruded profile.

In bituminous concrete pavement sections, the Transtech Shoulder Wedge Maker, Carlson Safety Edge End Gate or an approved equal shall be used to produce the safety edge. Contact information for these wedge shape compaction devices is listed below:

Transtech Systems, Inc.
1594 State Street
Schenectady, NY 12304
1-800-724-6306
www.transtechsys.com

or

Carlson Paving Products
18425 50th Ave. E
Tacoma, WA 98446
1-253-278-9426
www.carlsonpavingproducts.com

or an approved equal.

In P.C.C. pavement sections, the paver screed shall be modified to provide a chamfer at the end of the P.C.C. pavement in accordance with the details and notes on the Plans, or as directed by the Engineer.

Method of Measurement:

Safety Edge will not be measured for payment.

Basis of Payment:

The cost associated with the construction of safety edge(s), including but not limited to the wedge device, preparation and compaction of the fill or in situ material, and placement of the safety edge in accordance with the Plans and Details shall be incidental to the bituminous concrete pavement or P.C.C. pavement item being placed.

4/5/2017

401800 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 115 GYRATIONS, PG 64-22 (CARBONATE STONE)
401801 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 64-22 (CARBONATE STONE)
401804 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 70-22 (CARBONATE STONE)
401807 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 160 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
401813 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE B, 160 GYRATIONS, PG 70-22
401816 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE B, 160 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
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

401827 -BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 64-22, (NON-CARBONATE STONE)
401830 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 70-22, (NON-CARBONATE STONE)
401833 -BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 160 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
401838 - THIN BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 70-22
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 [1], Table 1 and tested according to AASHTO R29 with the following test ranges:

TEST Procedure	AASHTO REFERENCE	SPECIFICATION LIMITS
Temperature, °C	M 320	Per Grade
Original DSR, G*/sin (δ)	T 315	1.00 - 2.20 kPa[1]
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 gyration 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[1] (% MIN)		FINE AGGREGATE ANGULARITY[2] (% MIN)		CLAY CONTENT[3] (% - MIN)	FLAT AND ELONGATED [4] (% - MAX)
	≤ 100 MM	> 100 MM	≤ 100 MM	> 100 MM		
< 0.3	55/-	-/-	-	-	40	-
0.3 to < 3	75/-	50/-	40	40	40	-
3 to <10	85/80[5]	60/-	45	40	45	-
10 < 30	95/90	80/75	45	40	45	-
30	100/100	100/100	45	45	50	10

[1]Coarse Aggregate Angularity is tested according to ASTM D5821.
[2]Fine Aggregate Angularity is tested according to AASHTO TP-33.
[3]Clay Content is tested according to AASHTO T176.
[4]Flat and Elongated is tested according to ASTM 4791 with a 5:1 aspect ratio.
[5] 85/80 denotes that 85% of the coarse aggregate has one fractured face and 80% has two or more fractured faces.

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

TEST METHOD	SPECIFICATION LIMITS
Toughness, AASHTO T96 Percent Loss, Maximum	40
Soundness, AASHTO T104 Percent Loss, Maximum for five cycles	20
Deleterious Materials, AASHTO T112 Percent, Maximum	10
Moisture Sensitivity, 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 sublot become available. The control charts shall be easily and readily accessible at the plant laboratory. The following parameters shall be plotted from the testing:
  - Asphalt cement content.
  - Volumetrics (air voids, voids in mineral aggregates [VMA])
  - Gradation values for the following sieves:
    - 4.75 mm (#4).
    - 2.36 mm (#8).
    - 0.075 mm (#200).
    - Operational guidelines (trigger points) to address times when the following actions would be considered:
      - Increased frequency of sampling and testing.
      - Plant control/settings/operations change.
      - JMF adjustment.
      - JMF change (See 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 DelDOT
- Failure to perform materials testing per their approved QC Plan
- Deviating from AASHTO or DelDOT 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^{R} Gyratory Compactor: once every year; verified once every month by the Engineer.
- Ovens: once every three months, verified once every month.
- Vacuum Container and Gauge (Rice Bowls): once every three months, verified once every month.
- Balances and Scales: once every year, verified once every month.
- Thermometers: once a year; verified once every month.
- Gyratory Compactor molds and base plates: once every year
- Mechanical Shakers: once every year
- Sieve Verifications: once every year

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

(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 Gsb, apparent specific gravity Gsa, 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[1]

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										
	25.0 MM		19.0 MM		12.5 MM		9.5 MM		4.75 MM	
SIEVE SIZE	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
37.5 MM	100	-	-	-	-	-	-	-	-	-
25.0 MM	90	100	100	-	-	-	-	-	-	-
19.0 MM	-	90	90	100	100	-	-	-	-	-
12.5 MM	-	-	-	90	90	100	100	-	100	-
9.5 MM	-	-	-	-	-	90	90	100	95	100
4.75 MM	-	-	-	-	-	-	-	90	90	100
2.36 MM	19	45	23	49	28	58	32	67	-	-
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:

Volumeric 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

Volumeric Property	Superpave Criteria
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 gyration, the percentage of the asphalt cement component (both total and virgin), and the percentages of the aggregate amounts retained on the sieves to be addressed by the JMF as shown in Table 1.

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 (kg/m²) 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: Gmm: + / -0.030 and Gmb: + / - 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:

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

- Minimum surface temperature of 32°F and
- Minimum production temperature of 275°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.

12/7/2015

601502 - TEMPORARY PROTECTIVE SHIELD

Description:

This work consists of furnishing all materials and installing a temporary protective shield at the locations described and in conformance with the details and notes on the Plans, as described in these Special Provisions, and/or as directed by the Engineer.

Materials and Construction Methods:

In order to protect vehicular traffic against damage from falling material, debris, and other demolition operations, while superstructure concrete is being removed, the Contractor shall furnish and erect temporary protective structures under the work area and 5' (1.5 m) minimum beyond all sides of full depth concrete deck removed.

The Protective Structures shall meet with the following:

1. The shields shall be supplemented with such additional suitable enclosures of tarpaulins or wire mesh as may be necessary in order to insure against the dropping of materials, tools, equipment, and other objects below the level of the shield.

2. Broken concrete and other debris shall not be allowed to accumulate on the shields, but shall be removed promptly. The shields shall not be used for storing or stockpiling construction materials.

3. Timber shall have an allowable flexure stress of 11 MPa and the shield must be designed for 100 lb/sq. ft. (5 kPa) live load and60 mph (100 km/hr) wind load.

4. All plywood shall be new and shall be not less than 3/4" (19 mm) thick.

5. Bolts, nuts, washers, structural steel, etc. shall conform to Section 601 of the Standard Specifications.

6. The shield shall be assembled by means of bolts and nails, all as approved by the Engineer.

7. The flooring and siding of the shield shall have no cracks or openings through which material particles may fall.

8. The Contractor shall submit shop drawings for the shields, including erection plans, to the Engineer for approval, prior to the start of the work.

9. All connections of the protective structures to the steel work of existing bridge shall be made by means of clamps or other approved devices. The drilling of holes in the existing steel work, or welding thereto, will not be permitted.

10. Unless otherwise noted on the Plans, the minimum underclearance over roadways (pavement and shoulder) shall be as follows:

    14.5′ (4.42 m) for interstate and other controlled access highways

    14.0′ (4.27 m) for all other roadways

    No portion of the temporary shield (including connection devices) shall encroach on under clearances.

11. A suggested protective shield has been shown on the Plans. The Contractor may submit alternate protective shield system to the Engineer for approval. If the Contractor intends to use temporary protective shield system other than shown in the Plans, for which he/she shall be required to submit the design and sealed by Professional Engineer registered in the State of Delaware prior to commencing work. No additional payment will be made for this item of work regardless of type of temporary protective shield system used.

12. After protective shield has served its purpose, and approval has been given by the Engineer, the Contractor shall remove and dispose of the temporary protective shield away from the site to the satisfaction of the Engineer.

Method of Measurement:

The quantity of temporary protective shields will not be measured.

Basis of Payment:

The quantity of temporary protective shield will be paid for at the Contract lump sum price. Price and payment will constitute full compensation for furnishing all materials and performing the work as detailed and noted on the Plans, for removal and disposal of the protective shield materials, and for all labor, tools, equipment, and incidentals necessary to complete the work.

4/5/04

601505 - TIMBER PIER REHABILITATION

General:

This work shall consist of the rehabilitation of the timber pier on Bridge 3-161 by the Contractor, including clearing of mud, debris and vegetation, application of antifungal treatment to halt the spread of rot in the timbers and application of structural epoxy to repair existing voids. Work shall comply with all applicable Federal, State and local rules, regulations and ordinances.

In the event of a conflict between these Special Provisions and the above-mentioned standards, rules regulations, and ordinances, the most stringent requirement shall apply.

The treatment as proscribed in the plans and specifications is based on the extent of deterioration as determined during the inspection in February 2014. The Contractor shall inspect the timber pier of BR 3- 161 prior to commencement of this work. This inspection shall be used to verify the current extent of deterioration, locate external cavities and detail a treatment and epoxy repair plan in accordance with the plans and specifications. The Contractor shall submit this plan to the Engineer for approval.

The rehabilitation of the timber pier should be performed before the installation of new bearings on the pier and should be coordinated with the other rehabilitation tasks on Bridge 3-161.

Product Storage and Handling:

Deliver materials in manufacturer's original, unopened containers. Store the material inside at room temperature or as recommended by manufacturer. Clean up and properly store unused or excess material. Do not leave unused material unattended.

Do not use material which has exceeded the manufacturer's shelf life.

Follow safety precautions as defined by manufacturer or product associations or OSHA.

Store sand and gravel in a dry and clean area.

Cleaning of Timber Pier:

Perform this step before installation of antifungal treatment, or rot repair. Remove mud, debris and vegetation from the top of the pier. Provide broom swept condition. Proper disposal of this material is the responsibility of the Contractor.

Antifungal Treatment:

Apply solid anhydrous disodium octaborate rods (Borate/Bor8 rods, or approved equal) to 10"X12" timber cribbing and header beams and the tops of the 12" diameter piles, following the layout as provided in plans and conforming to manufacturer's recommendations.

9/16" diameter hole can be drilled horizontal, at 45 degree downward angle or upward as required by orientation of member/access limitations. Insert 1/2" X 4" rod and plug hole using 9/16" plug.

Holes are to be drilled in solid wood. Do not insert rods through checks or cavities in the member. If a cavity in the timber is found via drilling, do not insert rod and instead follow procedure for filling the cavity with epoxy as described below.

Submittals:

1. Submit detailed treatment plan showing proposed antifungal rod layout in conformance with plans and specifications, and identifying proposed locations of epoxy repair.
2. Submit manufacturer's product literature, product specifications, and Material Safety Data Sheets (M.S.D.S) as applicable for:
    i. Solid antifungal rods and accessories.

Method of Measurement:

The Timber Pier Rehabilitation work will not be measured.

Basis of Payment:

Payment for the Timber Pier Rehabilitation work will be made at the contract lump sum price bid for Item 601505, Timber Pier Rehabilitation, complete and in place, which price shall include all devices, materials, labor, tools, equipment, Quality Control activities and incidentals necessary to complete the work in accordance with the Specifications and Special Provisions.

4/20/17

601535 - TIMBER SIDEWALK (COMPOSITE)

Description:

This work shall consist of the replacement of the timber sidewalk on Bridge 3-152 by the Contractor. Work shall comply with all applicable Federal, State and local rules, regulations and ordinances.

In the event of a conflict between these Special Provisions and the above-mentioned standards, rules regulations, and ordinances, the most stringent requirement shall apply.

Product Storage and Handling:

Store products according to the manufacturer's suggested product storage methods. Keep material covered until the time of installation.

Design and Performance Requirements

A. Structural Performance:
   a. Deck: Uniform Load – 100lbf/sq.ft.
B. Fire-Test Response Characteristics per ASTM E-84.
C. Color: Natural Wood
D. Size: 2inX6in nominal, 1.5inX5.5in actual

Composite timber physical and mechanical properties:

Test	Test Method	Value	
Flame spread	ASTM E 84	60	
Thermal Expansion	ASTM D 1037	1.9 x 10-5 inch/inch/degreeF	
Moisture Absorption	ASTM D 1037	< 1%	
Nail Withdrawal	ASTM D1761	163 lbs/in	
Screw Withdrawal	ASTM D1761	558 lbs/in	
Fungus Resistance	ASTM D1413	Rating - no decay	
Termite Resistance	AWPAE1-72	Rating = 9.6	
		Ultimate (Typical)Values *	**Design Values**
Compression Parallel	ASTM D198	1588 psi	540 psi
Compression Perpendicular	ASTM D143	1437 psi	540 psi
Bending Strength	ASTM D198	3280 psi	500 psi
Shear Strength	ASTM D143	1761 psi	360 psi
Modulus of Elasticity	ASTM D4761	495,000psi	200,000 psi
Modulus of Rupture	ASTM D4761	3800 psi	1800 psi

* Ultimate strength values are not meant for design analysis. Design values are for temperatures up to 130F (54C)

Submittals:

A. Product Data Indicate sizes, profiles, surface style, and performance characteristics
B. Samples: For each product specified, one sample representing actual product color, size, and finish.

Execution:

Install products according to the manufacturer's suggested installation procedures. Gap decking per manufacturer's recommendations based on temperature at installation. Minimum gap of 1/8 inch shall be provided for end-to-end and end-to-width installations. Minimum gap of 1/4 inch shall be provided at width-to-width installations and installations abutting solid objects. Limit all gaps to no more than 1/2 inch.

Fasten to steel members using galvanized ¼" diameter countersunk steel bolts. Install two fasteners at each end of 2X6 composite timber member and at intermediate points supported by steel stringers.

Clean products according to the manufacturer's suggest cleaning recommendations.

Method of Measurement:

The Composite Timber Sidewalk work will be measured in units of Square Feet.

Basis of Payment:

Payment for the Composite Timber Sidewalk work will be made at the contract Square Foot price bid for Item 601535, Composite Timber Sidewalk, which price shall include all devices, materials, labor, tools, equipment, Quality Control activities and incidentals necessary to complete the work in accordance with the Specifications and Special Provisions.

4/21/17

602579 - DRILLING HOLES AND INSTALLING DOWELS

Description:

This work consists of furnishing all materials and drilling holes for dowels or anchor bolts as required and grouting the anchor bolts or dowels in place where required in the locations indicated on the Plans or as directed by the Engineer.

Materials:

The material for epoxy grout shall be MARK-194 CARBOPOXY GROUT as manufactured by POLY-CARB, 33095 Bainbridge Road, Cleveland, Ohio 44139 (Telephone 1-800-225-5649 or 216-248-1223) or SIKADUR 31 HI-MOD GEL as manufactured by Sika Corporation, 3000 Valley Ford Circle, King of Prussia, PA 19406, (Telephone 1-800-933-7452) or MASTERFLOW MP as manufactured by Master Builders, Inc., 23700 Chagrin Boulevard, Cleveland, Ohio 44122, (Telephone 1-216-831-5500 or 1-800-628-9990) or approved equal.

Construction Methods:

Drill holes at the locations and to the minimum depth shown on the Plans. Hole diameters shall be drilled in accordance with the epoxy grout manufacturer's recommendations considering the size(s) of the dowels or as shown on the Plans. Grout the anchor bolts or dowels in place using the epoxy grout in a manner to complete bonding of the anchor bolts or dowels in the holes and in accordance with manufacturer's recommendations. Repair any damage caused by the drilling operations to the satisfaction of the Engineer at no additional cost to the Department.

Method of Measurement:

The quantity of holes will be measured as the actual number of each hole drilled, grouted and accepted.

Basis of Payment:

The quantity of holes will be paid for at the Contract unit price per each. Price and payment will constitute full compensation for furnishing and placing all materials, for all labor, equipment, tools, and all necessary incidentals to complete the work. Dowels and/or anchor bolts will be measured and paid for under a separate item(s) unless indicated otherwise on the Plans.

12/10/01

602586 - REHABILITATION OF CONCRETE STRUCTURE

Description:

This work consists of preparation and furnishing all materials, and repairing portions of the existing concrete substructure and/or superstructure in accordance with the notes and details on the Plans and as directed by the Engineer.

All applicable requirements of Section 602 of the Standard Specification for performing the work under this item shall be applicable except as modified herein.

Materials:

Concrete for repair work shall consist of a mixture of Portland Cement, aggregate, water, and other admixtures to provide a workable concrete. The Contractor has the option of using either Class A Concrete, Micro-Silica Modified Concrete, or Latex Modified Concrete for this item. The minimum concrete temperature at the time of placement shall be 75°F (24°C). The mix shall have a minimum compressive strength of 2000 psi (15 MPa) in 6 hours, if required in the Plans, and 4500 psi (30 MPa) in 28-days. The following shall be included in the Portland Cement Concrete mixture composition supplied by the Contractor:

Coarse Aggregate - Del. No. 8 Stone meeting the grading requirements of Section 813
Coarse Aggregate/Sand Ratio - 50 to 60%
Portland Cement Type I - 705 lb/yd³ (418 kg/m³) [Min.]
Water/Cement ratio - 0.45 (Max.)
Slump - 3" - 6″ (75 to 150 mm)
Air - 5 % to 8%
Admixture - The quantity and AASHTO type or combination of AASHTO types of admixtures shall be determined by the Contractor.

If the Contractor chooses to use Class A concrete, the concrete shall have materials present in the mixture to mitigate alkali-silica reactivity (ASR) as per Section 812. Also, accelerators, if used, shall be non-chloride based.

If the Contractor chooses to use Micro-Silica Modified Concrete, the Micro-Silica shall conform to the requirements of AASHTO M307. If the Contractor chooses Latex Modified Concrete, the Latex Modifier shall be non-toxic, film forming, polymeric emulsion to which all stabilizers have been added at the point of manufacture, and shall be homogeneous and uniform in composition.

The Contractor shall be responsible for the quality of the concrete placed in any weather or atmospheric conditions. A smooth, durable riding surface of uniform texture, true to the required grade and cross-section, shall be obtained.

If Class A Concrete is utilized, prior to concrete placement, an approved bonding agent shall be applied to the existing concrete to ensure proper bond. If either the Micro-Silica Modified Concrete or the Latex Modified Concrete are utilized, the bonding agent shall be the rehabilitation concrete grout, placed and brushed into the rehabilitation areas. The grout shall be scrubbed onto the rehabilitation areas with enough care to ensure that all surfaces are evenly covered and that excess grout will not collect in low area.

Reinforcement, if required, shall be as indicated on the Plans.

Construction Methods:

All deteriorated, loose, and honeycombed concrete, as determined by the Engineer, shall be removed from the surface areas to be repaired with a pneumatic hammer. Unless specified otherwise on the Plans, the size of the hammer shall be 15 lb (7 kg). maximum for superstructure repair and 30 lb (14 kg). maximum for substructure repair.

All bar reinforcement exposed during the removal of the concrete shall be thorougly cleaned of rust and other foreign material by abrasive grit (use non silica, low dusting abrasive) blasting and then cleaned with a stream of compressed air before starting any repair work. In the case of damaged bar, it shall be cut

and mechanically spliced or replaced with a new bar of the same size and lapped or field-welded to the ends of the existing bar to the satisfaction of the Engineer. There shall be no separate payment for such work, and the cost shall be included in the item except that the new reinforcing bar will be paid for separately under a separate item in this Contract.

The Contractor shall submit to the Engineer a drawing showing details of forms and support system with appropriate dimensions for approval prior to the placing of concrete to repair the structure.

Concrete shall not be allowed to drop from the top of the forms which could otherwise result in the separation of the mix. Only approved mixing and placing equipment shall be used in preparation and handling of the concrete. Oil and other rust inhibitors shall be removed from all equipment in contact with the concrete before the mixes are used.

Method of Measurement:

The quantity of rehabilitation of concrete structure will be measured as the number of cubic feet (cubic meters) of concrete placed for the purpose of structure rehabilitation and accepted.

Basis of Payment:

The quantity of rehabilitation of concrete structure will be paid for at the Contract unit price per cubic feet (cubic meter). Price and payment will constitute full compensation for furnishing and placing all materials including concrete, abrasive grit blast cleaning of reinforcement bars, splicing and/or replacement of existing reinforcement bars, removal and disposal of deteriorated concrete, placement and removal of formings, surface preparation, for submission of working drawings, and all other work as described herein and on the Plans, for all labor, tools, equipment, and necessary incidentals to complete the work but shall not constitute payment for new bar reinforcement which shall be paid for under a separate item of this Contract.

3/14/02

602611 - REPAIR OF CONCRETE STRUCTURES BY EPOXY INJECTION

Description:

This work consists of furnishing all materials and repairing cracks in existing concrete structures by means of an epoxy injection system in accordance with the notes and details on the Plans and as directed by the Engineer.

Materials:

The epoxy injection system shall consist of a non-sag epoxy bonder to seal the surface cracks, and an injection epoxy used under low pressure to penetrate and fill the cracks, and bond the crack surfaces together.

The epoxy injection system shall be MARK-8 Non-sag epoxy bonder and Mark 10 injection epoxy manufactured by POLY-CARB, or NO. 22 Epoxy Paste and NO. 4 Eva - Pox manufactured by E-poxy Industries, Inc., or Duralcrete Gel and Duralcrete LV injection epoxy manufactured by Dural International Corporation, or Sikadur 31 Hi-Mod Gel and Sikadur 35 Hi - Mod LV injection epoxy, manufactured by Sika Corporation, or Nitobond Epoxy Gel and Nitobond ULV manufactured by Fosroc, Inc., or Approved equal. The Contractor shall furnish a copy of the comprehensive preparation and application instructions prior to the actual application, which have been developed by the manufacturer for use with the proposed epoxy bonder and epoxy injection system.

Construction Methods:

Concrete surfaces adjacent to the cracks to be repaired shall be cleaned to the extent necessary to achieve an adequate bond with epoxy bonder, and only by approved procedures which will not cause abrasive grit or concrete dust to get into the cracks. The use of solvents or thinners in cracks or on the bonding surfaces will not be permitted.

Dimensions of epoxy bonder to be used to seal the cracks shall be a maximum of 1/16″ (1.5 mm) thick and 1″ (25 mm) wide. Cracks to be injected shall have injection ports or tees installed in them. Unless otherwise specified on the Plans or directed by the Engineer, injection ports or tees shall be spaced at 6″ (150 mm) to 12″ (300 mm) for vertical repair and 6″ (150 mm) to 18″ (450 mm) for horizontal repair, but in no case closer together than the thickness of the concrete member if full depth penetration is desired. However, in certain cases, depth and spacing of holes at injection ports or tees shall be established with due consideration of the crack widths and depths compatible with flow characteristics of the epoxy and injection pressure to ensure that no further damage will be done to the member being repaired. Ports or tees shall be set in dust free holes made either with vacuum drills or chipping hammers. After injection ports or tees have been inserted into the holes, all surface cracks in the area to be repaired shall be sealed with epoxy bonder between ports to ensure retention of the pressure injected epoxy within the confines of the member. The application of epoxy bonder shall be limited to clean and dry surfaces, and substrate temperatures shall be limited to not less than 50°F (10°C) during epoxy application. The Contractor shall follow the manufacturer's recommendations for surface preparation, mixing of the components of the bonder epoxy and injection epoxy system, surface sealing and applications and all other works. If there is conflict between these specifications and the manufacturer's recommendations, the latter will prevail.

Method of Measurement:

The quantity of epoxy injection will be measured as the number linear feet (linear meters) of cracks injected and accepted. The non-sag epoxy bonder for sealing the crack surface areas shall not be measured and the cost shall be included in the unit price bid for this item.

Basis of Payment:

The quantity of epoxy injection will be paid for at the Contract unit price per linear foot (linear meter). Price and payment shall include full compensation for furnishing all materials, surface preparation, application, cleaning the areas of spills and other contaminates, abrading the concrete surface areas, for all tools, equipment, labor, and all necessary incidentals to complete the work.

3/15/02

602797 - PORTLAND CEMENT CONCRETE (PCC) LINK SLAB

A. Description:

This work consists of building a link slab of Portland Cement Concrete (PCC) within a newly constructed, rehabilitated, or retrofitted bridge. Except as modified by this special provision, all work is to be in accordance with the DelDOT Standard Specifications for Road and Bridge Construction (August 2001, including latest revisions) (Standard Specifications).

B. Materials:

Fine aggregates used for PCC material must be virgin silica sand consisting of a gradation curve with 50% particles finer than 0.04 mils and a maximum grain size of 12 mils.

Fibers to be used for PCC material must be manufactured of poly-vinyl-alcohol (PVA) with a fiber diameter of 1.5 mils and a length between 0.3 inch and 0.5 inch. The surface of the fiber must be oiled by the manufacturer with 1.2% (by weight) hydrophobic oiling compound along the length of the fiber. Fiber strength shall be a minimum of 232 ksi with a tensile elastic modulus of at least 5,800 ksi.

Water Reducing, High Range Admixture: Water reducing, high range admixture (superplasticizer) complying with ASTM C 494, Type F or G, ASTM C 1017, Type 1 or 2. In addition, the selected water reducing, high range admixture should be comprised of a polycarboxylate chemical composition.

Retarding Admixture: Retarding admixture complying with ASTM C 494, Type D.

C. PCC Mix Design Requirements:

The PCC mixture requirements are shown in Table 1. For the mixture proportions listed, fine aggregate weight is assumed to have a dry bulk density of 2.60. The Contractor will adjust the mix design for aggregate absorption (assumed Moisture Content = 0.1%, Absorption Capacity = 9.0%, Specific Gravity = 2.65), and for specific gravity if it differs by more than 0.02 from the assumed value. At the site, additional High Range Water Reducer (HRWR) may be added to the mix to adjust the workability of the mix with onsite approval of the Engineer. Water additions are not allowed at the bridge site or in transit.

The adjusted mix design must be submitted to the Engineer a minimum of five days prior to placement of the PCC link slab. Strength requirements for PCC material are shown in Table 2.
The PCC material supplier must be approved by the Engineer and should be familiar and experienced with batching, mixing, and placement of PCC material. Adequate experience with PCC batching, mixing, and placement techniques is achieved after participating in PCC batching, mixing, and placement training to be arranged with DelDOT personnel (or designated DelDOT representatives) prior to the Contractor's first project using PCC material.
Adequate workability of the PCC mixture can be verified using a standard slump cone. Workability testing should be performed on a flat plexiglass or glass surface upon discharging of the PCC mixture at the site. Upon removal of the cone, the resulting pancake of PCC material which is formed must be greater than 30 inches in average diameter and less than 90 inches. No check on air content is necessary.

Table 1:

PCC Mix Design Parameter	Value
Mix Water (net)	544 lb/cyd
Portland Cement, Type I	973 lb/cyd
Fly Ash, Type F	1167 lb/cyd
Fine Aggregate, Dry	778 lb/cyd
High Range Water Reducer (HRWR)	14.6 lb/cyd
Poly-vinyl-alcohol Fibers	43.8 lb/cyd
Retarding Admixture	Optional

Table 2:

Minimum Strength of PCC Material	7 day	14 day	28 day
Compressive	3200 psi	4000 psi	4500 psi
Tensile (Uniaxial)	500 psi	500 psi	500 psi
Ultimate Tensile Strain Capacity	2% (uniaxial tension)		

D. Trial Batch:

The Contractor shall appoint a technical representative capable of making adjustments to the batching and mixing of PCC material. This representative must be familiar with the mixing, batching, and placement of PCC material. The technical representative will designate a batching sequence of PCC material to ensure uniform fiber dispersion, and homogeneity of the material. This batching sequence must be approved by the Engineer. The technical representative will be present at the trial batch and at the first placement of PCC material to make recommendations and adjustments.

A four cubic yard trial batch shall be mixed and placed at the mix plant or as designated by the Engineer, a minimum of twenty eight working days prior to full production. The Engineer must be notified of the time of the trial batch mix a minimum of 48 hours before batching. Quality assurance specimens shall be cast from this trial batch according to Section F Quality Assurance and tested by DelDOT personnel or designated DelDOT representatives, to validate early age hardened properties of the PCC mixture.

The trial batch shall be prepared following the adjusted mix design and with the same materials that will be used in the PCC link slab mixture. For the trial batch to be considered successful, workability, fiber dispersion, mixture rheology, 7 and 14, day compressive and tensile strengths, and uniaxial tensile strain capacity must meet the requirements of this special provision. Workability is evaluated as outlined in Section C of this provision. Qualitative judgment must be made by the Engineer as to proper homogeneous fiber dispersion throughout the fresh material, and acceptable overall rheology of the mix for the intended application. If the trial batch does not meet these requirements, the trial batch shall be repeated at no additional cost to the department.

E. Preparation, Placement, and Cure of PCC Material:

Trucks delivering PCC material to the project must be fully discharged within one hour of charging at the plant as required by Section 812.06 of the Standard Specifications. Preparation of the formwork shall proceed according to Section 602.08 of the Standard Specifications. Preparation of concrete surfaces shall proceed according to Section 602.10 of the Standard Specifications. Prior to placement of the link slab, all concrete/PCC interfaces shall be wetted with a uniform spray application of water so that the surfaces are moist at the time of placement, with no standing water. Water collecting in depressions shall be blown out with clean, oil free, compressed air. Because of the high flowability of PCC material and placement on a sloped bridge deck, any vibration may pose problems with maintaining the location of the PCC material, causing it to flow towards the low point of the crown before setting. Special methods with phased construction will be needed when vibrations are present during placement of the PCC material.

Finishing of the surface shall follow Section 602.20 of the Standard Specification. Special care must be taken to ensure that creation of transverse surface grooves does not disturb fiber distribution on the finished surface. Light texturing with a rake can achieve this result. The careful use of a tining rake shortly after initial setting of the PCC material is allowed to produce a surface texture resulting in acceptable ride performance. When using the rake, care must be taken not to remove fibers from the top layer of PCC material. If this is not possible, texturing of the hardened surface must be undertaken to achieve an acceptable riding surface.

Application of curing compound and curing of the PCC material shall follow Section 602.18(a) of the Standard Specifications. If necessary, the removal of the continuous wet curing system within the PCC portion of the construction is permitted after two days provided that the 7 day compressive and tensile strengths and tensile strain capacity given in Table 2 have been reached. Sidewalk, curb, or barrier shall not be cast on the deck until the link slab has received a minimum two day continuous wet cure. Heavy equipment will not be permitted on the link slab until the link slab has reached an age of at least 4 days, and then not until the PCC has attained the 28-day strength listed in Table 2. This sidewalk, curb, or barrier wall must be cast of PCC material over the link slab region unless calculations of both thermal gradient stresses and uniform thermal stresses show that stresses within the link slab remain below the cracking strength of PCC material.

If the workability limits outlined within Section c of this special provision cannot be met, or due to other site circumstances, the Contractor is allowed to use hand held vibration equipment to aid in placement and consolidation of the PCC material if approved by the Engineer. Vibration should be used judiciously to promote proper consolidation, and only as a final measure in guaranteeing the quality of the construction. Care must be taken during vibration to not affect proper dispersion of the fibers within the fresh composite.

F. Quality Assurance:

Quality assurance of PCC materials will be consistent with Section 602.19 of the Standard Specifications. In addition to standard compressive cylinders, sets of four uniaxial tensile test plates will be cast on site at identical intervals to casting of compressive cylinders. Dimensions for uniaxial specimens are 12" x 3" x 1". Tolerances for these plates are ± 0.05 inches for all dimensions and tensile forms should be properly treated with form oil or other approved releasing agent to facilitate easy form stripping. Uniaxial tension tests are to be performed by a testing organization or research facility designated by the Engineer. The testing organization or research facility shall be experienced and familiar with conducting uniaxial tension testing of Strain hardening cementitious composites. Scheduling, completion, and reporting of all material testing are the responsibility of the Contractor. Uniaxial tension tests are to be run on a servo-hydraulic testing system under displacement control using a test speed of 0.1 mil/sec.
Testing laboratories must be approved by the Engineer prior to testing.

Measurement and Payment:

Method of Measurement. The quantity of portland cement concrete will be measured as the number of cubic yards of concrete placed and accepted. The volume will be computed using the dimensions shown on the Plans, or as ordered in writing. The quantity of concrete in deck slabs will be computed from design deck thickness.

Basis of Payment. The quantity includes formwork necessary for placement of link slab, consolidation (if necessary), finishing, texturing, and curing of the link slab PCC material. The quantity also includes furnishing and placing the PCC material within the prepared link slab limits as shown on the plans. The quantity will be documented, measured, and paid for using batch plant tickets with deductions made for material wasted or rejected. The initial trial batch quantity will be included in this quantity. Any additional trial batches necessary to adjust the mix will be prepared at no additional cost to the Department.

4/21/17

605522 - URETHANE PAINT SYSTEM, EXISTING STEEL

Description:

This work consists of recoating and/or overcoating the entire existing steel structure as specifically indicated on the plans and in this item.

Materials:

All paint used on this structure shall be produced by a single manufacturer, and the coating system shall conform to the minimum requirements as noted below.

Total Removal Primer

Generic Type:	Zinc-rich, single-component, moisture-cured polyurethane
Vehicle Type:	Moisture-cured polyurethane
Volume of Solids:	60% Minimum
Pigment Type:	3.5 lbs/gal (0.42 kg/liter) Micaceous Iron Oxide/Zinc dust
Zinc/Micaceous Iron Oxide Content in Dry Film by Wt.:	83% Minimum
Coverage:	3 mils (75 µm) DFT minimum
VOC:	Not to Exceed 2.8 lbs/gal (0.335 kg/liter)
Weight Per Liter:	Minimum 22 lbs/gal (2.64 kg/liter)
Primer Performance:	No rusting, blistering or scribe undercutting when tested by salt fog in accordance with SSPC Paint 20.

Overcoat Primer or Intermediate Coat

Generic Type:	Micaceous iron oxide single-component, moisture-cured polyurethane.
Vehicle Type:	Moisture-cured polyurethane
Volume Solids:	60% minimum
Solids by Wt:	82% $\pm$ 2.0% minimum
Pigment Type:	4.0 lbs/gal (0.48 kg/liter) micaceous iron oxide
Color:	Tinted to distinguish from primer
Isocyanate:	Formulate with a moisture cure polyisocyanate diphenylmethane diisocyanate based prepolymer with an isocyanate content of 16.0 to 17.0 weight percent, an NCO equivalent weight of 247 to 263, and a viscosity of 1400 ± 200 cps @ 77°F (25°C).
Isocyanate Content:	9.6 ± 0.9 weight percent as determined by Kentucky method KM64-250.
Coverage:	3 mils (75 µm) DFT minimum
VOC:	Not to exceed 2.8 lbs/gal (0.335 kg/liter)
Weight per liter:	Minimum 16 lbs/gal (1.92 kg/liter)

Topcoat:

Generic Type:	Two-component, aliphatic polyurethane
Vehicle Type:	Acrylic aliphatic polyurethane
Resin:	A hydroxyl bearing polyacrylic resin with a typical hydroxyl content of 4% and an average equivalent weight of 425 (both values at 100% resin solids). This resin will make up at least 95% of the polyol vehicle solids.
Curing Agent:	A polyfunctional polyisocyanate resin based on Hexamethylene diisocyanate with an NCO content of 21.3 - 21.8% and an average NCO equivalent weight of 195.
Light Stabilizer:	The base component (Component A) must contain 1% of a hindered amine light stabilizer. This is calculated from the resin solids of component A and Component B.
Initial Gloss:	80%(minimum) @ 60° per ASTM D523

Solids Content:	Total solids of the mixed product will be 75.0 ± 2.0 percent by weight as determined by ASTM D 2369 using a 4 hour air dry time plus 1 hour oven dry at 110°F (43.3°C).
Pot Life:	3 hours minimum at 77°F (25°C) and 50% relative humidity
Color:	As specified in the Plans
Coverage:	3 mils (75 µm) DFT minimum
VOC:	Not to exceed 2.8 lbs/gal (0.335 kg/liter)

All M.I.O. (Micaceous Iron Oxide) filled products must conform to ASTM D5532, Type I and have a certification of conformance from the Raw Materials Manufacturer. Each single coat of paint shall be a color different from the others. The color of the primer and intermediate coat shall be at the Contractor's option, and shall provide contrast with the underlying substrate or previously applied pant. The color of the finish paint shall be as specified in the Contract Plans.

A moisture-cured polyurethane topcoat will be acceptable provided the manufacturer submits data showing a 70% minimum gloss after 24 months exposure in southern Florida on panels facing due south at 45° from the horizon on a color the same or similar to the ones in the Plans.

The coatings manufacturer shall supply, in writing, the minimum and maximum recoat times of the primer and intermediate coat. If the Contractor fails to complete the painting during these established time periods, the surface area shall be cleaned at the Contractor's expense if necessary as determined by the Engineer.

Basis of Acceptance – All components of the system (primer, intermediate and finish coats) will be accepted on the basis of the manufacturer's written certification that the batch(s) produced meets their product specification and this Item. In addition, the Contractor shall submit a 1 quart (liter) sample of each component of the system (primer, intermediate and finish coats) to the DelDOT Materials and Research Section (call (302) 760-2401 for details) 30 days prior to the start of painting. The samples submitted shall be from paint to be used on the bridge with the same batch numbers and shall be labeled with the manufacturer's name, product name, component part, batch number, date of manufacture, and the bridge on which it is to be used. The Department will perform testing on the paint submitted. The Department reserves the right to take random samples of the paint at anytime during the construction and application.

Only paint arriving on the site in new, unopened containers shall be used.

Containers of paint shall be labeled with the manufacturer's name, product name, component part, batch number, date of manufacture, and shelf life date. Paint in containers having expired shelf life dates shall be immediately removed from the work site.

Construction Methods:

All structural steel members, railings, fascia, downspouts and other miscellaneous steel items that have previously been painted shall be cleaned and painted.

Surface Preparation – Surfaces to be cleaned shall be identified in the following manner:

Blast clean surfaces for total removal in accordance with Item 605533. Pressure wash surfaces for overcoating in accordance with item 605622.

Where power tool cleaning is specified, the perimeter or edge of intact paint adjoining the cleaned surface shall be feathered back and the adjoining paint shall be tightly adhered. Ragged edges on intact paint will not be allowed. Adherence will only be considered satisfactory if the adjoining remaining paint is smoothly feathered back and cannot be removed by lifting with a dull putty knife. After power tool cleaning operations are completed, all residue generated by the cleaning work shall be removed by vacuuming.

Blast cleaned surfaces shall be accepted by visual comparison to a project prepared standard. The Contractor shall prepare the project standard by cleaning a representative area on the structure that is being prepared for painting. The prepared standard shall generally conform to SSPC-Vis 1-89, "Visual Standard for Blast Cleaned Surface," Pictorial Standards A SP10, B SP10, C, SP10, and D SP10, as applicable, and shall be approved by the Engineer before the start of general cleaning work. More than one standard may be necessary if the cleaned steel differs significantly from the photographic standards due to the surface

conditions or other factors. There shall be one standard per span of the bridge. Each standard shall be at least 1' x 1' (300 mm x 300 mm) in size, and shall be located in an area of the span that is accessible to, and approved by the Engineer.

The Contractor shall protect the project standards from corrosion and contamination throughout the duration of the work. Protection shall be by applying a clear coat of polyurethane or by other means. At the completion of the cleaning work, the project standard shall be recleaned and painted in accordance with the specification. If, in the opinion of the Engineer, the project standard becomes deteriorated or otherwise ineffective, it shall be re-established in accordance with this specification at no additional cost to the Department.

Painting –

Manufacturer's Instructions – At least 5 working days prior to the start of work, the Contractor shall provide the Engineer with one copy of the paint manufacturer's current Technical Data and Materials Safety Data Sheets for the paint materials being furnished. Instructions, suggestions and precautions contained in these data sheets shall be followed to the extent that they do not contradict the provisions of this specification.

Specifications and Inspection Equipment – Prior to the start of and throughout the duration of work, the Contractor shall be required to supply the Engineer with the following:

One bound copy each of the SSPC surface preparation specifications SSPC-SP1, Solvent Cleaning, SSPC-SP11, Power Tool Cleaning to bare metal , and SSPC-SP10, Near-White Metal Blast Cleaning.

One bound copy of SSPC pictorial standard SSPC-Vis1-89, Visual Standard for Blast Cleaned Surfaces, SSPC-Vis3, Visual Standard for Power and Hand Tool Cleaning.

One bound copy of SSPC Paint Application Standard No. 2 (SSPC-PA2), Measurement of Dry Film Thickness with Magnetic Gages.

One Bachrach Sling Psychrometer (Includes air thermometer)

One set of US Weather Bureau Tables

Three (3) Surface Thermometers, 0-150°F (-18 to 66°C)

One Positector 6000 Electronic Dry Film Thickness Gage.

One spring micrometer and one roll per span of Testex X-Coarse Replica Tape

Atmospheric Conditions – Painting shall not be performed unless the following conditions are met:

The receiving surface is clean and free of "rustback" and free of condensation and visible moisture; and

The receiving surface and ambient air temperature shall be as recommended by the paint manufacturer, except that in no case shall the painting work be performed when the surface and ambient temperatures are less than 35°F (2°C) or greater than 100°F (38°C).

All surfaces shall meet the manufacturer's dew point requirements when painting is performed. For moisture-cured urethanes, a surface will be considered too wet to paint if a moist handprint is visible after the surface is touched.

No painting is to occur in the winter months between the dates of December 15 and March 15.

Mixing Paint – All paints shall be thoroughly mixed with mechanical mixers in accordance with the manufacturer's recommendations.

Solvent Restrictions – Thin only with approved manufacturer's thinner. Thinning is allowed only in strict accordance the manufacturer's recommendations and state VOC regulations. Unauthorized use of solvents shall result in recleaning and repainting the surface in accordance with this specification, at the Contractor's expense.

Paint Application – Paint coatings may be applied using brush, roller or spray methods, except the primer which shall be applied by spray methods.

Stripe coating with primer will be required on the following surfaces cleaned to bare metal. All welds, rivets, bolts, nuts, and edges of plates, angles, lattice, pieces or other shapes, and corners and crevices shall be "striped" with primer before the general primer coat is applied. All stripe painting will be performed using brush only. No other method will be allowed for stripe painting.

Complete protection against paint spatter, spillage, overspray, wind-blown paint, or similar releases of paint shall be provided. Covers, tarps, mesh and similar materials shall be placed around the work area to protect public and private property, pedestrian, vehicular, marine and other traffic, all portions of the bridge, highway appurtenances, waterways, and similar surrounding areas and property, upon, beneath, or adjacent to the structure.

Number of Coats –

Steel shall be painted with one coat of Primer, one coat of Intermediate coat, and one coat of topcoat.

Film Thickness – Paint shall be applied in sufficient quantity to produce the minimum dry film thickness specified under Material.

Painting Schedule – Primer shall be applied on the same day of the cleaning operation and before rusting occurs to the cleaned surface. Failure to apply primer to a cleaned surface within 8 hours shall result in recleaning the surface in accordance with this specification at no additional cost to the Department.

The intermediate paint shall be applied to the receiving surface within 14 days of the application of the primer, or within the manufacturer's recommended maximum recoat time, whichever is less.

The finish paint shall be applied to the receiving surface within 14 days of the application of the previous coat (intermediate), or within the manufacturer's recommended maximum recoat time for the intermediate coat, whichever is less. The finish paint color on all the fascia beams for the bridge shall be painted with paint from the same batch number and date of manufacture in order to avoid uneven paint color. If more than one batch of paint is needed to paint the fascias, then a natural break point such as the end of a span shall be used to change batch numbers.

Areas failing to meet the specified minimum dry film thickness shall be recoated with the same type of paint to produce at least the total dry film thickness required. Paint applied containing thinners, paint applied to contaminated surfaces, and paint applied contrary to this specification shall result in recleaning and repainting the surface. The work of recleaning and repainting, if required, shall be done by the Contractor to the satisfaction of the Engineer at no additional cost to the Department.

If a coat of anti-corrosive grease is applied to an area on the bridge (such as the bearings) then the grease shall be sprayed with the finish coat of the bridge paint being used provided that the bearing for the other areas that are designated to receive the grease have already been cleaned and painted.

Materials Storage – Paint in storage shall be protected from damage and maintained between 40°F (4◦C) and 85°F (29◦C), unless the coatings manufacturer requirements are more stringent. Paint not used before the expiration date shall be immediately removed from the project site,

Painting of Galvanized Steel –

All galvanized steel surfaces shall be painted with a moisture-cured aluminum paint that is designed to adhere to galvanized steel surfaces. The moisture-cured aluminum paint must meet the following requirements:

One-Coat System

Generic Type:	Aluminum-filled aromatic moisture-cure urethane
Vehicle Type:	Moisture-cured aromatic polyurethane
Pigment Type:	Minimum 2 lbs/gal (0.240 kg/liter) non-leafing aluminum
Coverage:	2 mils (50 µm) DFT, minimum
VOC:	Not to exceed 3.5 lbs/gal (0.42 kg/liter)
Weight per gallon:	9.2 lbs/gal (1.10 kg/liter)
Solids by volume:	52.0 ± 1.0%
Shelf life:	6 months minimum from date of shipment

Stenciling Requirement – At the completion of the painting work, the completion date (month and year) and the bridge number, shall be stenciled on the structure in 3" (75 mm) numbers. The paint used for this stenciling shall be the same as the topcoat except the color shall be black. The numbers shall be stenciled on the outside of each fascia beam at the approaching traffic ends of the structure, at a location designated by the Engineer.

Method of Measurement:

The quantity of painting will not be measured.

Basis of Payment:

The quantity of painting will be paid for at the Contract lump sum price. Price and payment will constitute full compensation for furnishing all materials, equipment necessary to complete the work, cost of providing protection against damage during paint application, for all labor, tools and necessary incidentals to complete the job.

Progress payments will be made based on percentage of the structure cleaned and painted in accordance with this specification.

12/17/03

605533 - CLEANING EXISTING STEEL STRUCTURES, HAZARDOUS BASE (L.S.)
605629 - CLEANING EXISTING STEEL STRUCTURES, HAZARDOUS BASE (S.F.)

Description:

This work consists of cleaning the entire existing steel structure(s) or a part of it as noted on the Plans; collection; stabilization; and transportation of the "spent material" (rust particles, paint particles and dust, material assumed to be hazardous waste), resulting from cleaning operations, to an approved disposal site(s). The work under this item shall be performed in accordance with these Special Provisions and attached Appendix A.

Prior to the beginning of paint removal work, the Contractor shall set forth in detail and submit to the Delaware Department of Transportation (hereinafter referred to as Department), for approval, the proposed containment system (mini-containment system when only a part of the structure is to be cleaned as required) for complete capture, containment, collection and disposal of the "spent material" generated from paint removal work and testing by an outside laboratory, approved by the Department. The system shall be in compliance with these specifications, State, United States Environmental Protection Agency (EPA) and Occupational Safety and Health Act (OSHA) and other regulatory agencies with jurisdiction, rules, regulations, standards and guidelines in effect while the work is in progress. Upon approval, the plan shall be implemented to capture, contain, collect, and dispose of all "spent material".

The Contractor shall not begin cleaning and/or blasting operation until he/she has submitted final documentation that he/she has an approved disposal site and permits for the handling, storing, and transporting of hazardous waste and nonhazardous waste; and shall be responsible to protect the environment, workers, and the public from toxic substances resulting from the paint removal operations.

Pre-Bid Conference:

Prior to the bid opening, a date will be set if deemed necessary by the Contract Administration (bidder will be notified at the time of purchasing contract documents) for a pre-bid conference to alert the potential bidder to comply with the directives established by the OSHA, EPA and the State of Delaware during and after the execution of this item. It is recommended that the bidder (Prime Contractor) brings his/her Sub-Contractor to be engaged in removing the paint if he/she cannot perform the work of this item.

Materials:

The Contractor shall use recyclable metallic shot and metallic grit meeting the requirements of SSPC AB2 and SSPC AB3 as abrasive materials for removing paint.

Other removal and cleaning methods after approval may be used by the Contractor provided he/she can demonstrate that the proposed method satisfies all the safety and environmental requirements of this specification and provides a cleaned surface satisfactory to the Engineer.

Construction Requirements:

Containment System:

Prior to commencing any cleaning operations, the Contractor shall prepare a Cleaning Contaminant System for the capture, containment, collection and storage of the waste generated by the work, which includes abrasive blasting residue, spent blasting mediums, rust, paint particles, dust, etc.

The Containment System must be capable of containing the waste and resulting residue generated by the work. The Contractor shall strive to achieve total containment (100%); and is required to meet all Federal, State, City and Local regulations using the best available technology as applicable to each bridge site. The Containment System shall meet the requirements of SSPC Guide 6, Class 1A. Visible emisions in excess of SSPC Guide 6, Level 1 (one percent in the work day) shall be cause for immediate shut down until corrections are made.

While on the site, tarps shall be held securely in place, and kept sealed at all times during water blasting, paint removal and painting. For bridges over water, the Containment System shall include a skimming boom consisting of a float with a skirt to collect floating debris. Also, an approved capturing device such as floating curtain, screen or tarp shall be placed under and down wind of the bridge to catch rust, sand and paint particles; and the waste material collected on the capturing device shall be cleaned daily.

Prior to commencing work the Contractor must submit working drawings of the proposed containment system to the Department within 14 days from Notice of Award. The Department will review the drawings and evaluate the system as to its effect on the loading capacity of the existing structure. The Contractor shall also submit the design of the systems to be employed, including an analysis of the dead, live and wind loads which will be added to the existing structure by the containment system and blast waste. The load analysis shall be performed and stamped by a licensed Professional Engineer registered in the State of Delaware and experienced in bridge analysis. The analysis shall assure that the system will not induce a load on the bridge which will create an overstress condition or otherwise effect the structural integrity of the bridge. For bridges 23 feet (7 meters) or greater in height, the containment system submittals shall include a safety net meeting OSHA requirements in 29 CRF 126.105, 29 CRF 126.106, and 29 CRF 126.104. For bridges less than 23 feet (7 meters) in height, the submittals shall include necessary safety measurements such as safety harnesses, lifelines and lanyards meeting OSHA requirements in 29 CRF 126.104. In no case shall the containment system, safety devices, or equipment encroach upon the minimum bridge clearances shown on the Plans, unless otherwise approved by the Engineer.

The following guidelines shall be followed by the Contractor in preparing the Containment Drawing Plans. However, the Contractor may submit for approval a self-contained and self supporting blast and recovery system as an alternative option for removing the paint:

1. Working drawings with Professional Engineer Seal shall be submitted by the Contractor meeting the requirements of Subsection 105.04 of the Standard Specifications.

2. The working drawings shall show Containment System in plan & elevation views including details of clips and hangers.

3. The working drawings shall indicate maximum permissible load of abrasive or waste permitted on the Containment System.

4. The working drawings shall indicate if vehicles with abrasive and waste will be permitted on the bridge; if so indicate allowable load and locations. Vehicle and equipment loads may not be permitted behind abutments if surcharging results.

5. The working drawings shall indicate all restrictions on bridge including any load posting.

6. Permanent attachments or fasteners to the bridge will not be permitted.

7. The working drawings shall show the location(s) of skimming boom(s) if the bridge is over water.

8. The working drawings shall identify all containment system components; and shall indicate all rigid framework, work platform and scaffolding.

9. All curtains, screens or tarps used for containment shall be weighted down.

10. No load shall be attached to the bridge railings unless railing is in good condition, and details and calculations showing loading are approved by the Department.

With submission of the Containment System Drawing, the Contractor shall be required to develop and submit for approval an Effective Safety Program to be followed during the paint removal period. The Contractor's employees, before being engaged in paint removal work, must have proper training in accordance with the OSHA General Industry Standard.

The review and acceptance of the working drawings by the Department shall in no way relieve the Contractor of any responsibility for obtaining the required degree of capture, containment and collection.

Cleaning of Containment System must be properly maintained while work is in progress and shall not deviate from the approved working drawings without prior approval of the Engineer. Air within the containment structure shall be exhausted rapidly to maintain a slight negative pressure, so that outside air is drawn in through specifically designed openings rather than having contaminated air leaking from inside the containment. Also, sufficient fresh air must be circulated so that dust is reduced to enable good visibility for the operator. Public access to all rigging, scaffolding and the containment systems must be denied at all times.

Air Monitoring for PM 10 and TSP Lead:

The intent of the monitoring requirements in this specification is for the Contractor to establish a baseline background reading for the area(s) in proximity to steel cleaning. This specification also requires the Contractor to perform all of the testing required to ensure that lead particles are adequately contained and captured by the Contractor's steel cleaning operations. All costs associated with this work are included in the Contractor's bid price.

The Contractor shall engage a consultant responsible for conducting air monitoring work during the operation of the paint removal period; monitoring shall be conducted on the area downwind of the lead control area. The qualification of the consultant shall be approved by the Department prior to his/her engagement in air monitoring service. The air quality standard shall be monitored in accordance with National Ambient Air Quality Standards (NAAQS). At a minimum this containment system shall achieve a SSPC level 1 Standard Emissions level.

Baseline Monitoring shall take place at each structure where the Contractor is required to clean the existing steel in order to establish preconstruction background readings for the area(s) involved. Baseline Monitoring shall occur for a minimum of 3 consecutive calendar days before the steel cleaning begins. The Contractor shall conduct the monitoring so that the monitored hours match the proposed work schedule for the contract, including nightwork. The minimum duration of the monitoring for each calendar day must be 8 hours, regardless of the Contractor's proposed work schedule. The required sampling type shall be 2 (two) PM-10 and 2 (two) TSP-Lead and the Engineer must approve the locations of the sampling. During lead paint removal, air monitoring shall commence just prior to the start of any lead removal operation and shall continue whenever the contractor is cleaning steel under this item. The required sampling type shall be PM-10 and TSP-Lead and the Engineer must approve the locations of the sampling. If problems with containment occur, the Engineer will require the air monitoring to be reinstalled at the Contractor's expense.

The acceptance level for PM 10 (particles with an aerodynamic diameter less than or equal to a nominal 10 micrometers) shall be 150 micrograms per cubic meter of air for 24-hour average concentration (450 micrograms per cubic meter of air over an eight-hour period assuming no emissions occur from the project for the remaining 16 hours).

The acceptance level for Total Suspensed Particulate Matter (TSP) lead emissions shall be 1.5 micrograms per cubic meter of air averaged over a calendar quarter of the year, which can be converted as noted below to achieve daily lead level allowance during the project operation.

$$DA = \frac{90}{PD} x 1.5 \mu g/m^3, where$$

DA = Daily Allowance ($\mu g/m^3$)

PD = Number of paint removal operation days anticipated in a 90-day period.

For example, if it is expected that 30 days out of 90 will be worked, the TSP lead emission criteria for each of those days would be 4.5 $\mu g/m^3$, over a 24-hour period (90/30 x 1.5). However, since the paint removal operation will not continue for the full 24 hours, this level of emissions can be increased using the following formula:

$$ADA = DA x \frac{24}{H}, where$$

ADA = Adjusted Daily Allowance ($\mu g/m^3$)
H = Hours worked in 24 hours.

Using the above example, if the paint removal operation is continued for eight hours out of each 24-hour workday, the ADA will be 13.5 $\mu g/m^3$ (4.5 $\mu g/m^3$ x 24/8). Thus, 13.5 $\mu g/m^3$ could be emitted during the eight hours of work, provided no emissions occur during the remaining 16 hours.

The size of the containment system shall be a work area approximately equivalent to what a work crew can blast clean, inspect, paint and move in a 24 hour period. The Engineer may permit a larger containment system if the Contractor can demonstrate that such a system will increase prodictivity and not interfer with the flow of traffic. When dust leaks are noted in the containment system, repairs shall be made as soon as possible.

If at any time during the execution of the work, the cleaning containment system fails to function at the required level of efficiency, the Contractor must immediately suspend all operations except those intended to minimize the adverse impact to the environment. Operations shall not resume until modification have been made to correct the cause of the failure.

The Contractor shall have a full time hygenist on the job site during lead paint removal activities to insure required hygene procedures are being followed.

Cleaning:

All structural steel surfaces shall be cleaned and free of all rust, rust scale, mill scale, paint or other foreign matter in accordance with the requirements of SSPC-SP10.

Should the Contractor elect to use wet or water-vapor sandblasting, the water shall contain 0.32 percent of sodium nitrate and 1.28 percent by weight of ammonium phosphate for the purpose of inhibiting the development of rust.

No visible lead containing residue, debris, or paint chips shall remain or be present outside the containment area upon the completion of the abatement cleanup. Visible lead containing residue, debris, or paint chips outside the containment area shall be cleaned up immediately.

The type of containment systems used when cleaning steel shall be Class 1A for abrasive blasting and Class 2P for Power Tool Cleaning as per SSPC - Guide 6 "Guide for Containing Debris Generated During Paint Removal Operations".

Collection, Storage and Disposal of Hazardous and Non-Hazardous Waste:

All waste discharged and collected from the Containment System must be protected in a manner so as to prevent migration of the waste into the environment; and the Contractor shall abide by all Federal and State regulations relating to collection, storage and disposal of the hazardous waste and solid waste.

The Contractor shall provide a clean up area with soap, water and container for collection and disposing of the hazardous waste at each work site. The Contractor shall obtain a permit for hauling the hazardous waste from the State Department of Natural Resources and Environmental Control (DNREC).

Each day the Contractor shall collect and contain waste material in sealed 55 gallon (208 liter) open head type drums (I.C.C. Specification 17-H). All drums shall be in new condition and approved for use by the Engineer. Drums shall be labeled with the words "HAZARDOUS WASTE" and tagged in accordance with all State regulations including bridge number, Contract number, Contractor's name, contents and the date when waste accumulation in the drum begins. No more than 29 drums of hazardous material shall be kept at the site of each bridge.

The waste to be placed in drums also includes all filters used in abrasive blasting equipment and vacuum power tools for removing hazardous and nonhazardous paint waste; these filters shall be removed when the Contract is complete. At the end of the Contract all such filters shall be removed from equipment used on the project and placed in drums with other hazardous waste for proper disposal.

At the end of each working day the Contractor shall haul the waste material contained and collected to an approved temporary secure accumulation site. This site must be approved by the Engineer and be maintained in a secured condition by the Contractor. Hauling of hazardous waste must be performed by a license hauler.

The accumulation site must be capable of preventing the migration of the lead contaminated waste material into the environment. The accumulation area must also provide protection from vandalism and unauthorized access by the general public. At the completion of the work and in the presence of the Engineer, the Contractor shall take representative samples of the accumulated residues collected at each bridge.

The storage site must be capable of preventing the migration of the lead contaminated waste material into the environment. The storage area must also provide protection from vandalism and unauthorized access by the general public. At the completion of the work, the Contractor shall take representative samples of the accumulated residues collected at each bridge to be analyzed for lead content.

Samples exceeding 5 PPM (parts per million) according to the Toxicity Characteristics Leaching Procedure (TCLP) test shall be considered a hazardous waste and disposed of as hazardous waste. If the sample's toxicity level has dropped to 5 ppm or less, then the waste can be transported and disposed of as industrial waste, provided it is stabilized.

In order to stabilize the industrial waste (below the toxicity level), a slurry made from Portland Cement (10% of waste by volume) and water (50% of cement by volume) shall be added to the waste and thoroughly mixed at the disposal site by the licensed hazardous waste hauler. In no case shall blasting debris or dust collector waste be directly disposed of as an industrial waste. They shall either be stabilized or disposed of as a hazardous waste, irrespective of the results of the TCLP Test.

The samples shall be delivered to a laboratory approved by the Department for testing according to the Toxicity Characteristic Leaching Procedure (TCLP). Should test results indicate and if the contaminants listed in the following are above their respective regulatory limits, the residue shall be deemed a hazardous waste, and must be treated before disposal.

EPA HAZARDOUS WASTE NO.	CONTAMINANT	CAS NO.	REGULATORY LEVEL (mg/L)
D004	Arsenic	7440-38-2	5.0
D005	Barium	7440-39-3	100.0
D006	Cadmium	7440-43-9	1.0
D007	Chromium	7440-47-3	5.0
D008	Lead	7439-92-1	5.0
D009	Mercury	7439-97-6	0.2
D010	Selenium	7782-49-2	1.0
D011	Silver	7440-22-4	5.0

The Contractor shall remove from the accumulation site all treated waste within 90 days from the date of accumulation; and be transported to an industrial dump facility approved by the Delaware Department of Natural Resources and Environmental Control for disposal of such waste. A copy of the completed waste manifest (signed and dated by the Contractor and the Engineer at the site) shall be forwarded to the Department.

Method of Measurement:

For item 605533, the quantity of cleaning existing steel structures will not be measured. For item 605629, the quantity of cleaning existing steel structures will be measured by the square foot (square meter) of area cleaned and accepted.

Basis of Payment:

For item 605533, the quantity of cleaning existing steel structures will be paid for at the Contract lump sum. For item 605629, the quantity of cleaning existing steel structures will be paid for at the Contract unit price per square foot (square meter).

Price and payment shall constitute full compensation for furnishing and installing all materials, working drawings and Professional Engineer's service, Containment System, collection and temporary storage of the waste material as required, air monitoring service including consulting services, testing materials for contaminants, cleaning the structure, revisions and resubmissions of the Containment Plan and or Systems that may be required during the execution of the work, for providing respiratory protection and protective clothing to the worker and Departments employee at the time of inspection, hygiene facilities, for stabilizing the hazardous material and transporting and disposing of the stabilized waste complying with all the requirements as described herein in these special provisions, for all labor, equipment, tools and necessary incidentals to complete the work.

NOTE

The latest issue, revision, or amendment of the references noted below shall govern in execution of this item unless otherwise noted. **If there is a conflict between the attached Appendix A of this Special Provisions and the references noted below, the latter shall prevail**.

1. Steel Structures Painting Council (SSPC) Standards

SSPC-AB2	Specification for Cleanliness of Recycled Ferrous Metal Abrasive
SSPC-AB3	Specification for Newly Manufactured Steel Abrasive.
SSPC-QP 1	Standard Procedure for Evaluating Qualifications of Painting Contractors
SSPC Guide 6I	Guide for Containing Debris Generated During Lead Paint Removal Operations
SSPC Guide 7 (DIS)	Guide for the Disposal of Lead-Contaminated Surface Preparation Debris

2. U.S. Government Code of Federal Regulations

- 29 CFR, Part 1926.62, Safety and Health Regulations for Construction
- 40 CFR, Subchapter I, "Solid Wastes" (parts 260-263, and 268)

3. American National Standards Institute (ANSI)

ANSI/ASC Z9.4 For Exhaust Systems Abrasive Blasting Operations -- Ventilation and Safe Practice

4. State of Delaware

- 7 Del. C., chapter 63 - Hazardous Waste Management Act
- The Delaware Regulations Governing Hazardous Waste (DRGHW)
- 7 Del. C., Chapter 60 - Delaware Water and Air Resources Act
- The Delaware Regulations Governing Solid Waste (DRGSW)

SPECIAL NOTICE TO CONTRACTORS

The following documentation will be required with the Bid Proposal Form. If this documentation is not submitted with the bid, the bid will be considered Non-responsive.

Proof is required that the Prime Contractor, if he/she is performing the cleaning/painting operation, and any cleaning/painting Subcontractors are certified by the Steel Structures Painting Council (SSPC) Painting Contractor Certification Program (PCCP) QP-1 and QP-2. Such certification shall be for the duration of the project.

3/17/09

APPENDIX A

OCCUPATIONAL SAFETY AND HEALTH STANDARD FOR OCCUPATIONAL EXPOSURE TO LEAD DURING CONSTRUCTION

The regulations specified under the following topics and as described herein shall be followed by the Contractor, engaged in removing and cleaning lead base paint from the steel structures. This Appendix is considered as part of the Special Provisions for Items 605629 and 605533 - Cleaning Existing Steel Structures and 605614 and 605618 - Cleaning Existing Steel Structures with Vacuum Power Tools.

.01 Scope and Application

A. This Appendix applies to occupational exposure to lead of every employee engaged in construction work. Each employer shall protect the employment and places of employment of each employee engaged in construction work by complying with the Appendix.

B. Compliance with this Appendix does not preclude or preempt the applicability of any other regulations or standards.

.02 Definitions

For the purpose of this Appendix certain words and terms are defined as follows.

A. Lead

(1) "Lead" means metallic lead, all inorganic lead compounds, and organic lead soaps.

(2) "Lead" does not include any other organic lead compounds.

B. "PEL" means Permissible Exposure Limit.

C. "TWA" means Time Weighted Average.

D. All references to "the Employer" herein shall mean "the Contractor", and all references to the Employee(s) shall mean "the Department's and Contractor's Employees".

.03 Permissible Exposure Limit (PEL)

A. The employer shall ensure that no employee is exposed to lead at concentrations greater than 50 micrograms per cubic meter of air averaged over an 8-hour period.

B. When an employee is exposed to lead for more than 8 hours in any work day, the employer shall use the following formula to reduce the permissible exposure limit, as a time weighted average (TWA) for that day: Maximum permissible limit (in micrograms/cubic meter) = 400 divided by hours worked in the day.

C. Respirators. When respirators are used to supplement engineering and work practice controls to comply with the PEL and in accordance with the requirements of Regulation .06, the employer, for the purpose of determining compliance with the PEL, may:

(1) Consider employee exposure to be at the level provided by the protection factor of the respirator for those periods the respirator is worn; and

(2) Average those periods with exposure levels during periods when respirators are not worn to determine the employee's daily TWA exposure.

.04 Initial Determination and Exposure Monitoring

A. General

(1) For the purpose of this regulation, employee exposure is that exposure which would occur if the employee were not using a respirator.

(2) Personal Samples.

(a) With the exception of monitoring under Section C, below, the employer shall collect personal samples for the entire time during the shift when lead exposure may occur.

(b) The personal samples shall:

(i) Include at least one sample for every job classification in each work area during each shift; and

(ii) Be representative of the monitored employee's regular, daily exposure to lead.

B. Initial Determination.

(1) An employer having a jobsite covered by this chapter shall determine before the beginning of potential exposure to lead if an employee may be exposed to lead at or above the PEL level.

(2) Written record.

(a) The employer shall:

(i) Make a written record of the determination; and

(ii) Post the record in a place accessible to employees.

(b) At a minimum, the record shall include:

(i) The information specified in Section C, below;

(ii) The date of determination;

(iii) Location of the jobsite;

(iv) Process;

(v) Materials;

(vi) Location within the jobsite; and

(vii) The name and social security number of employees monitored.

C. Basis of Initial Determination.

The employer shall base an initial determination on any of the following, relevant considerations:

(1) Information, observation, calculations, or anticipated operations which indicate employee exposure to lead;

(2) Previous measurements of airborne lead and analytical methods meeting the criteria of Section I, below; and

(3) Other indications of potential lead exposure.

D. Positive Initial Determination and Initial Monitoring.

(1) When a determination conducted under Sections B and C, above, shows the possibility of employee exposure at or above the PEL level, the employer shall conduct exposure monitoring immediately at the start of the operation which may involve lead exposure.

(2) The monitoring shall be representative of the exposure for each employee in the workplace who is exposed to lead.

(3) When the type of jobsite, process, and materials involved has not changed, measurements of airborne lead, taken in accordance with Section I, below, and made during the preceding 12 months may by used to satisfy this requirement.

E. Negative Initial Determination.

When the employer determines, in accordance with Sections B and C, above, that no employee is exposed to airborne concentrations of lead at or above the PEL level, the employer shall make a written record of the determination in accordance with Section B.

F. Frequency.

Except as required by Section G, below, when the initial determination or subsequent monitoring reveals employee exposure:

(1) Above the PEL, the employer shall conduct monitoring quarterly until at least two consecutive measurements, taken at least 7 days apart, are at or below the PEL.

G. Additional Monitoring.

(1) When there is either a production, jobsite, material, process, control, or personnel change which may result in new or additional lead exposure or any other reason to suspect a change, which may result in new or additional exposures to lead, the employer shall conduct additional monitoring in accordance with this chapter.

(2) When an employee complains of symptoms which may be attributable to exposure to lead, the employer shall conduct personal monitoring representative of the exposure to each employee in the affected job classification or performing the same operation who may be exposed to lead.

H. Employee Notification.

(1) Within 5 working days of the receipt of any monitoring results, the employer shall notify each employee in writing of the results which represent that employee's exposure.

(2) Whenever the results indicate that the representative employee exposure, without regard to respirators, exceeds the PEL, the employer shall include in the written notice:

(a) A statement that the PEL was exceeded; and

(b) A description of the corrective action that has been, or will be, taken to reduce exposure to a level at or below the PEL.

I. Accuracy of Measurement.

The employer shall use a method of monitoring and analysis which has an accuracy, to a confidence level of 95 percent, of not less than plus or minus 20 percent for airborne concentrations of lead equal to or greater than 50 micrograms/cubic meter averaged over an 8-hour period.

.05 Methods of Compliance

A. Engineering and Work Practice Controls.

(1) When any employee is exposed to lead above the PEL, the employer shall implement engineering and work practice controls, including administrative controls, to reduce and maintain employee exposure to lead, except to the extent that the employer can demonstrate that these controls are not feasible.

(2) When the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposure to a level at or below the PEL, the employer shall:

(a) Use them to reduce exposure to the lowest feasible level; and

(b) Supplement them by the use of respiratory protection which complies with the requirements of Regulation .06.

B. Compliance Program

(1) Each employer shall establish and implement a written compliance program to reduce exposure.

(2) Written Program. The written compliance program shall, at a minimum, include:

(a) A description of each operation in which lead is expected, including

(i) Equipment used,

(ii) Materials used,

(iii) Controls in place,

(iv) Crew size,

(v) Employee job responsibilities,

(vi) Operating procedures, and

(vii) Maintenance practices;

(b) A description of the specific means that will be employed to achieve compliance;

(c) A report of the technology considered in meeting the PEL;

(d) A work practice program which includes items required under Regulations .07,.08, and .09;

(e) The administrative control schedule required by Section C, if applicable; and

(f) Other relevant information.

(3) Written programs shall be:

(a) Submitted upon request to the Department; and

(b) Available at the jobsite for examination and copying by the Department, any affected employee, or authorized employee representative.

(4) At least every 6 months, the employer shall:

(a) Review the written compliance program; and

(b) If necessary, revise it to reflect the current status of the program.

C. Administrative Controls.

If administrative controls are used as a means of reducing employee TWA lead exposure, the employer shall establish and implement a job rotation schedule which includes:

(1) The name or identification number of each affected employee;

(2) The duration and the exposure level at each job or work station where an affected employee is located; and

(3) Any other information which may be useful in assessing the reliability of administrative controls in reducing exposure to lead.

.06 Respiratory Protection

A. General.

(1) When this chapter requires the use of respirators, the employer shall:

(a) Provide respirators that comply with the requirements of this regulation, at no cost to the employee; and

(b) Ensure their use.

(2) Respirators shall be used:

(a) During the time period necessary to install or implement engineering or work practice controls;

(b) In a work situation in which engineering and work practice controls are not sufficient to reduce exposure to a level at or below the PEL; and

(c) Whenever an employee requests a respirator.

B. Respirator Selection.

(1) When a respirator is required under this chapter, the employer shall select the appropriate respirator or combination of respirators in accordance with this section from Table I. Respiratory Protection for Lead Aerosols.

(2) Powered Air-Purifying Respirators: The employer shall provide a powered air-purifying respirator instead of the respirator specified in Table I Respiratory Protection for Lead Aerosols whenever:

(a) An employee chooses to use this type of respirator; and

(b) This respirator will provide adequate protection to the employee.

(3) The employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part II.

C. Respirator Usage.

(1) The employer shall ensure that the respirator issued to the employee:

(a) Exhibits minimum facepiece leakage; and

(b) Is fitted properly.

(2) Fit Test.

(a) For each employee wearing a negative pressure respirator, the employer shall perform either a quantitative or qualitative face fit test:

(i) At the time of initial fitting; and

(ii) Minimally, every 6 months after that.

(b) The qualitative fit test:

(i) May be used only to test the fit of a half-mask respirator when it is otherwise permitted to be worn; and

(ii) Shall be conducted in accordance with the directive set in 29 CFR 1926.62.

(c) The tests shall be used to select facepieces that provide the protection prescribed in Table I. Respiratory Protection for Lead Aerosols.

TABLE I. RESPIRATORY PROTECTION FOR LEAD AEROSOLS

Airborne concentration of lead or condition of use	Required respirator[1]
Not in excess of 0.5 milligram/cubic meter (10X PEL).	Half-mask, air-purifying respirator equipped with high efficiency filters.[2,3,]
Not in excess of 1.25 milligram/cubic meter (25 x PEL)	Hood or helmet supplied air respirator operated in a continous flow mode.
Not in excess of 2.5 milligram/cubic meter (50X PEL).	(1) Full facepiece, air-purifying respirator with high efficiency filters.[3]

	(2) Any powered, air-purifying respirator with high efficiency filters.[3]
Not in excess of 50 milligram/cubic meter (1000x PEL).	Half-mask, supplied-air respirator operated in positive-pressure mode[2].
Not in excess of 100 milligrams/cubic meter (2000X PEL).	Supplied-air respirators with full facepiece, hood, helmet, or suit, operated in positive pressure mode.
Greater than 100 milligrams/cubic meter, unknown concentration or fire fighting.	Full facepiece, self-contained breathing apparatus operated in positive-pressure mode.

[1]Respirators specified for high concentrations can be used at lower concentrations of lead.

[2]Full facepiece is required if the lead aerosols cause eye or skin irritation at the use concentrations.

[3]A high efficiency particulate filter means 99.97 percent efficiency against 0.3 micron size particles.Certain Specific Type CE blast helmets can be used in atmospheres that are 1000x PEL.

(3) If an employee exhibits difficulty in breathing during the fit test or during use, the employer shall make available to the employee an examination in accordance with Regulation .11A(2) to determine whether the employee can wear a respirator while performing the required duty.

D. Respirator Program.

(1) The employer shall institute a respiratory protection program in accordance with the applicable section(s) of 29 CFR 1926.62, 29 CFR 1926.1127, and 29 CFR 1910.134.

(2) The employer shall:

(a) Permit an employee who uses a filter respirator to change the filter elements when an increase in breathing resistance is detected;

(b) Use identification of filters, cartridges and canisters with NIOSH color coded approved labels as required.

(c) Maintain an adequate supply of filter elements for this purpose; and

(d) Permit an employee who wears a respirator to leave the work area to wash his or her face and respirator facepiece when necessary to prevent skin irritation associated with respirator use.

(e) Record Keeping - Records must be kept and available in accordance with 29CFR 1910, 20 and include medical evaluation, fit testing, and a copy of the respiratory protection program.

.07 Protective Work Clothing and Equipment

A. Provision and Use.

When an employee is exposed to lead above the PEL, without regard to the use of respirators, or when the possibility of skin or eye irritation exists, the employer shall:

(1) Provide, at no cost to the employee, appropriate protective work clothing and equipment, such as, but not limited to:

(a) Coveralls or similar full-body work clothing:

(b) Shoes or disposable shoe coverlets, gloves, and hats;

(c) Face shields, vented goggles, or other appropriate protective equipment which complies with the applicable section(s) of 29 CFR 1926.62.

(2) Ensure that the employee uses the appropriate protective clothing and equipment.

B. Cleaning and Replacement.

The employer shall:

(1) Provide the protective clothing required in Section A -

(a) In a clean and dry condition,

(b) Daily to an employee whose exposure level, without regard to a respirator, is over 200 micrograms/cubic meter of lead as an 8-hour TWA, and

(c) At least weekly to other employees;

(2) Provide for the cleaning, laundering, or disposal of protective clothing and equipment required by Section A;

(3) Repair or replace required protective clothing and equipment as needed to maintain their effectiveness;

(4) Ensure that employees remove all protective clothing:

(a) At the completion of a work shift, and

(b) Only in designated change areas;

(5) Ensure that contaminated protective clothing which is to be cleaned, laundered, or disposed of, is placed in a closed container which:

(a) Is located in the designated change area, and

(b) Will prevent dispersion of lead;

(6) Inform, in writing, any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead;

(7) Ensure that a container required by Section B(5), above, is labelled as follows:

CAUTION: CLOTHING CONTAMINATED WITH LEAD. DO NOT REMOVE DUST BY BLOWING OR SHAKING. DISPOSE OF LEAD CONTAMINATED WASH WATER IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, OR FEDERAL REGULATIONS; and

(8) Prohibit the removal of lead from protective clothing or equipment by blowing, shaking, or any other means which disperses lead into the air.

.08 Housekeeping

A. Surfaces.

An employer shall maintain all surfaces as free as practicable of accumulations of lead.

B. Cleaning Floors.

(1) An employer shall vacuum floors and other surfaces where lead accumulates.

(2) When vacuuming or other equally effective methods are not feasible, an employer shall use wet methods, including wet sweeping, wet shovelling, or wet brushing.

(3) Floors and other surfaces where lead accumulates may not be cleaned by the use of compressed air.

(4) An employer may use dry methods only when vacuuming and wet methods are not practicable.

C. Vacuuming.

When vacuuming methods are used, the employer shall ensure that the vacuums are equipped with HEPA filters are used and emptied in a manner which minimizes the re-entry of lead into the workplace.

.09 Hygiene Facilities and Practices.

A. For the purpose of this regulation, employee exposure is that exposure which would occur without regard to the use of a respirator.

B. The employer shall ensure that in an area where employees are exposed to lead above the PEL:

(1) Neither food nor beverage is present or consumed;

(2) Tobacco products are not present or consumed; and

(3) Cosmetics are not applied.

C. Designated Change Areas**.**

(1) The employer shall provide clean designated change areas for employees who work in areas where their airborne exposure to lead is above the PEL.

(2) The employer shall ensure that designated change areas are equipped with separate storage facilities for protective work clothing and equipment and for street clothes, sufficient to prevent cross-contamination.

D. Washing Facilities.

(1) The employer shall ensure that employees who work in areas where their airborne exposure to lead is above the PEL, shower or wash at the end of the work shift.

(2) The employer shall provide washing facilities in accordance with the applicable section(s) of 29 CFR 1926.62.

(3) The employer shall ensure that employees who are required to shower or wash pursuant to Section D(1) do not leave the jobsite wearing any clothing or equipment worn during the work shift.

E. Food and Beverage Consumption Areas.

The employer shall:

(1) Provide employees who work in areas where their airborne exposure to lead is above the PEL with food and beverage consumption areas:

(a) Sufficiently removed from the affected work area; and

(b) Readily accessible to employees; and

(2) Ensure that employees who work in areas where their airborne exposure to lead is above the PEL, wash their hands and face prior to eating, drinking, smoking, or applying cosmetics.

(3) Ensure that employees who work in areas where their airborne consumption areas with protective work clothing or equipment unless surface lead dust has been removed by vacuuming or other cleaning methods.

F. Lavatories.

The employer shall provide an adequate number of lavatory facilities which comply with the applicable section(s) of 29 CFR 1926.62.

.10 Medical Surveillance Program.

A. General.

(1) The employer shall institute a medical surveillance program for all employees who are or may be exposed above the PEL level. A blood test to determine the lead level is required for all employees before engaged in operation of removing/cleaning the paint. The Department is responsible for its employees for blood test; however, the Contractor shall be responsible for his workers for such test.

(2) The employer shall ensure that all medical examinations and procedures are performed by, or under the supervision of, a licensed physician.

(3) The employer shall provide the required medical surveillance, as set forth in Regulation .11:

(a) Without cost to employees, and

(b) At a reasonable time and place.

B. Biological Monitoring.

(1) Blood Lead and ZPP or FEP Level Sampling and Analysis: The employer shall make available to each employee covered under Section A(1), above, biological monitoring in the form of blood sampling and analysis for:

(a) Lead; and

(b) Zinc protoporphyrin (ZPP), or Free erythocite protoporphyin (FEP) levels.

(2) The biological monitoring shall be provided on the following schedule:

(a) Before assignment, when an employee is being assigned for the first time to an area in which airborne concentrations of lead are at or above the PEL level;

(b) At least every 2 months during the first 6 months to each employee covered under Section A(1), above, after that, every 6 months;

(c) At least every 2 months for each employee whose last blood lead sampling and analysis indicated a blood lead level at or above 40 micrograms/100g of whole blood, until two consecutive blood samples and analysis indicate a blood lead level below 40 micrograms/100g of whole blood;

(d) At least monthly during the removal period of each employee removed from exposure to lead due to an elevated blood lead level; and

(e) At the termination of employment.

(3) Follow-up Blood Sampling Tests.

When the results of a blood lead level test indicate that an employee's blood lead level exceeds the numerical criteria for medical removal under Regulation .12A(1), the employer shall provide a

second (follow-up) blood sampling test within 2 weeks after receiving the results of the first blood sampling test.

(4) Accuracy of Blood Lead Level Sampling and Analysis.

Blood lead level sampling and analysis provided pursuant to these regulations shall;

(a) Have an accuracy, to a confidence level of 95 percent, within plus of minus 15 percent or 6 micrograms/100ml, whichever is greater; and

(b) Be conducted by a laboratory which:

(i) Is licensed by the Centers for Disease Control (CDC), United States Department of Health and Human Services, or

(ii) Has received a satisfactory grade in blood lead proficiency testing from CDC in the prior 12 months.

(5) Employee Notification.

Within 5 working days after receiving biological monitoring results, the employer shall notify in writing:

(a) Each employee of their blood lead level; and

(b) Each employee whose blood lead level exceeds 40 micrograms/100g, that this chapter requires temporary medical removal with Medical Removal Protection benefits when an employee's blood lead level exceeds the numerical criterion for medical removal under Regulation .12A(1).

.11 Medical Examinations and Consultations

A. Frequency.

The employer shall make available medical examinations and consultations to each employee covered under Regulation .10A(1) according to the following schedule:

(1) Immediately, for each employee for whom a blood sampling test conducted at any time during the preceding 12 months indicated a blood lead level at or above 40 micrograms/100g;

(2) As soon as possible, upon notification by an employee that:

(a) The employee has developed signs or symptoms commonly associated with lead intoxication,

(b) The employee desires medical advice concerning the effects of current or past exposure to lead on the employee's ability to procreate a healthy child, or

(c) The employee has demonstrated difficulty in breathing during a respirator fit test or during respirator use; and

(3) As medically appropriate for each employee who was either:

(a) Removed from exposure to lead due to a risk of sustaining material impairment to health, or

(b) Otherwise limited pursuant to a final medical determination.

B. Content.

Medical examinations made available pursuant to Section A(1), above, shall include all of the following elements:

(1) A detailed work history and a medical history, with particular attention to:

(a) Past lead exposure (occupational and non-occupational),

(b) Personal habits (smoking, hygiene), and

(c) Past gastrointestinal, hematologic, renal, cardiovascular, reproductive, and neurological problems;

(2) A thorough physical examination, with particular attention to teeth, gums, hematologic, gastrointestinal, renal, cardiovascular, and neurological systems;

(3) Pulmonary status, if respiratory protection will be used;

(4) A blood pressure measurement;

(5) A blood sample and analysis which determines:

(a) Blood lead level which meets the requirements of Regulation .10B(4).

(b) Hemoglobin and hematocrit determinations, red cell indices, and examination of peripheral smear morphology,

(c) Zinc protoporphyrin or free erythocite protoporphyrin,

(d) Blood urea nitrogen, and

(e) Serum creatinine;

(6) A routine urinalysis with microscopic examination; and

(7) Any laboratory or other test which the examining physician deems necessary by sound medical practice.

C. The content of medical examinations made available pursuant to Section A(2) and (3), above, shall:

(1) Be determined by an examining physician; and

(2) If requested by an employee, include pregnancy testing or laboratory evaluation of male fertility.

D. Multiple Physician Review Mechanism

(1) If the employer selects the initial physician who conducts any medical examination or consultation provided to an employee under this chapter, the employee may designate a second physician to:

(a) Review any findings, determinations, or recommendations of the initial physician; and

(b) Conduct the examinations, consultations, and laboratory tests the second physician deems necessary to facilitate this review.

(2) The employer shall promptly notify an employee of the right to seek a second medical opinion after each occasion that an initial physician conducts a medical examination or consultation pursuant to this chapter.

(3) The employer may condition its participation in, and payment for, the multiple physician review mechanism upon the employee doing the following within 15 days after receipt of the foregoing notification, or receipt of the initial physician's written opinion, whichever is later:

(a) The employee informing the employer that he or she intends to seek a second medical opinion; and

(b) The employee initiating steps to make an appointment with a second physician.

(4) If the findings, determinations, or recommendations of the second physician differ from those of the initial physician, the employer and the employee shall ensure that efforts are made for the two physicians to resolve any disagreement.

(5) If the two physicians have been unable to reach agreement quickly, the employer and the employee, through their respective physicians, shall designate a third physician to:

(a) Review any findings, determinations, or recommendations of the prior physicians; and

(b) Conduct the examinations, consultations, and laboratory tests, and engage in discussions with the prior physicians that the third physician deems necessary to resolve disagreement of the prior physicians.

(6) The employer shall act consistently with the findings, determinations, and recommendations of the third physician, unless the employer and the employee reach an agreement which is otherwise consistent with the recommendations of at least one of the three physicians.

E. Information Provided to Examining and Consulting Physicians.

(1) The employer shall provide the initial physician conducting a medical examination or consultation under this chapter the following information:

(a) A copy of this chapter;

(b) A description of the affected employee's duties as they relate to the employee's lead exposure;

(c) The employee's exposure level or anticipated exposure level to lead and to any other toxic substance (if applicable);

(d) A description of personal protective equipment used, or to be used;

(e) Prior blood lead determinations; and

(f) Prior written medical opinions concerning the employee which are in the employer's possession or control.

(2) The employer shall provide the foregoing information to a second or third physician conducting a medical examination or consultation under this chapter upon request either by the second or third physician, or by the employee.

F. Written Medical Opinions.

(1) The employer shall obtain and furnish to the employee a copy of a written medical opinion from each examining or consulting physician which contains the following information:

(a) The physician's opinion as to whether the employee has any detected medical condition which would place the employee at increased risk of material impairment of the employee's health form exposure to lead,

(b) Any recommended special protective measures to be provided to the employee,

(c) Limitations to be placed upon the employee's exposure to lead,

(d) Any recommended limitation upon the employee's use of respirators, including, if a physician determines that the employee cannot wear a negative pressure respirator, a determination of whether the employee can wear a powered air purifying respirator, and

(e) The results of the blood lead determinations;

(2) The employer shall instruct each examining and consulting physician:

(a) Not to reveal either in the written opinion, or in any other means of communication with the employer, any finding, including laboratory results, or diagnosis unrelated to an employee's occupational exposure to lead, and

(b) To advise the employee of any medical condition, occupational or non-occupational, which dictates further medical examination or treatment.

G. Alternate Physician Determination Mechanism.

The employer and the employee or authorized employee representative may agree to use any expeditious alternate physician determination mechanism in place of the multiple physician review mechanism provided by this chapter, provided that the alternate mechanism satisfies the other requirements contained in this chapter.

H. Chelation.

(1) The employer shall ensure that any person whom he retains, employs, supervises, or controls does not engage in prophylactic chelation of any employee at any time.

(2) If therapeutic or diagnostic chelation is to be performed by any person in Section H(1), above, the employer shall ensure that:

(a) It is done:

(i) Under the supervision of a licensed physician,

(ii) In a clinical setting,

(iii) With thorough and appropriate medical monitoring; and

(b) The employee is notified in writing before its occurrence.

.12 Medical Removal Protection

A. Temporary Medical Removal and Return of an Employee.

(1) Temporary Removal Due to Elevated Blood Lead Levels.

The employer shall remove an employee from work having an exposure to lead at or above the action level on each occasion that:

(a) A periodic and a follow-up blood sampling test conducted pursuant to Regulations .10 and .11 indicates that the employee's blood lead level is at or above 50 micrograms/100g; or

(2) Temporary Removal Due to a Final Medical Determination

(a) For the purposes of Section A(2), the phrase "final medical determination" means the outcome of either the multiple physician review mechanism or the alternate medical determination mechanism used pursuant to the medical surveillance provisions in Regulation .11, above.

(b) The employer shall remove an employee from work having an exposure to lead at or above the PEL level on each occasion that a final medical determination results in a medical finding, determination, or opinion that the employee has a detected medical condition which places the employee at increased risk of material health impairment from exposure to lead.

(c) When a final medical determination results in any recommended special protective measures for an employee, or limitations on an employee's exposure to lead, the employer shall implement the recommendations and act consistently with it.

(3) Return of the Employee to Former Job Status.

(a) The employer shall return an employee to his or her former job status in accordance with the following schedule:

(i) For an employee removed pursuant to Section A(1), when two consecutive blood sampling tests taken at least one month apart indicate that the employee's blood lead level is at or below 40 micrograms/100g of whole blood;

(ii) For an employee removed pursuant to Section A(2), when a subsequent final medical determination results in a medical finding, determination, or opinion that the employee no longer has a detected medical condition which places the employee at increased risk of material health impairment from exposure to lead.

(b) For the purposes of this subsection, the requirement that an employer return an employee to the employee's former job status is not intended to expand upon or restrict any rights an employee has or would have had, absent temporary medical removal, to a specific job classification or position under the terms of a collective bargaining agreement.

(4) Removal of Other Employee Special Protective Measures or Limitations.

The employer shall remove any limitations placed on an employee or end any special protective measures provided to an employee pursuant to a final medical determination when a subsequent final medical determination indicates that the limitations or special protective measures are no longer necessary.

(5) Employer Options Pending a Final Medical Determination.

When a multiple physician review mechanism, or alternate medical determination mechanism used pursuant to Regulation .11, has not yet resulted in a final medical determination with respect to an employee, the employer shall act as follows:

(a) Removal. The employer may remove the employee from exposure to lead, provide special protective measures to the employee, or place limitations upon the employee, consistent with the medical findings, determinations, or recommendations of any of the physicians who have reviewed the employee's health status.

(b) Return. The employer may return the employee to his or her former job status, end any special protective measures provided to the employee, and remove any limitations placed upon the employee, consistent with the medical findings, determinations, or recommendations of any of the physicians who have reviewed the employee's health status, with two exceptions:

(i) If the initial removal, special protection, or limitations of the employee resulted from a final medical determination which differed from the findings, determinations, or recommendations of the initial physician; or

(ii) If the employee has been on removal status for the preceding 18 months due to an elevated blood lead level, the employer shall await a final medical determination.

B. Medical Removal Protection Benefits.

(1) Definition of Medical Removal Protection Benefits.

For the purpose of this section, the requirements that an employer provide medical removal protection benefits means that an employer shall maintain the earnings, seniority, and other employment rights and benefits of an employee as though the employee had not been removed from normal exposure to lead or otherwise limited.

(2) Provision of Medical Removal Protection Benefits.

The employer shall provide to an employee up to 18 months of medical removal protection benefits on each occasion that an employee is removed from exposure to lead or otherwise limited pursuant to this chapter.

(3) Follow-up Medical Surveillance During the Period of Employee Removal or Limitation.

During the period of time that an employee is removed from normal exposure to lead, or otherwise limited, the employer may condition the provision of medical removal protection benefits upon the employee's participation in follow-up medical surveillance made available pursuant to this regulation.

(4) Workers' Compensation Claims.

If a removed employee files a claim for workers' compensation payments for a lead-related disability:

(a) The employer shall continue to provide medical removal protection benefits pending disposition of the claim;

(b) To the extent that an award is made to the employee for earnings lost during the period of removal, the employer's medical removal protection obligation shall be reduced by the amount of the award; and

(c) The employer shall receive no credit for workers' compensation payments received by the employee for treatment-related expenses.

(5) Other Credits.

The employer's obligation to provide medical removal protection benefits to a removed employee shall be reduced to the extent that the employee receives:

(a) Compensation for earnings lost during the period of removal either from a publicly or employer-funded made possible by virtue of the employee's removal.

(b) Income from employment with another employer compensation program; or

(6) Employees Whose Blood Lead Levels Do Not Adequately Decline Within 18 Months of Removal.

(a) The employer shall take the measures prescribed by Section B(6)(b) with respect to any employee:

(i) Removed from exposure to lead due to an elevated blood lead level; and

(ii) Whose blood lead level has not declined within the past 18 months of removal so that the employee has been returned to the employee's former job status.

(b) The employer shall:

(i) Make available to the employee a medical examination pursuant to this chapter to obtain a final medical determination with respect to the employee;

(ii) Ensure that the final medical determination obtained indicates whether the employee may be returned to his or her former job status, and if not, what steps should be taken to protect the employee's health;

(iii) When the final medical determination has not yet been obtained, or once obtained indicates that the employee may not yet be returned to the employee's former job status, continue to provide medical removal protection benefits to the employee until

either the employee is returned to former job status, or a final medical determination is made that the employee is incapable of ever safely returning to the employee's former job status.

(c) When the employer acts pursuant to a final medical determination which permits the return of the employee to the employee's former job status despite what would otherwise be an unacceptable blood lead level, later questions concerning removing the employee again shall be decided by a final medical determination.

(d) The employer need not automatically remove the employee pursuant to the blood lead level removal criteria provided by this regulation.

(7) Voluntary Removal or Restriction of An Employee.

Where an employer, although not required by this regulation to do so, removes an employee from exposure to lead or otherwise places limitations on an employee due to the effects of lead exposure on the employee's medical condition, the employer shall provide medical removal protection benefits to the employee equal to that required by Section B(2).

.13 Employee Information and Training

A. Training Program

(1) Each employer who has a jobsite in which there is a potential exposure to airborne lead at any level shall inform employees of this chapter.

(2) The employer shall:

(a) Institute a training program for employees subject to:

(i) Lead exposure at or above the action level, or

(ii) The possibility of skin or eye irritation; and

(b) Ensure their participation in the training.

(3) The employer shall provide initial training for those employees covered by Section A(2), above, before the time of initial job assignment.

(4) The training program shall be repeated at least annually for each employee.

(5) The employer shall ensure that each employe is informed of:

(a) The content of this chapter;

(b) The specific nature of the operations which could result in exposure to lead above the action level;

(c) The purpose, proper selection, fitting, use, and limitation of respirators;

(d) The purpose and a description of:

(i) The medical surveillance program, and

(ii) The medical removal protection program;

(e) The adverse health effects associated with excessive exposure to lead, with particular attention to the adverse reproductive effects on both males and females;

(f) The Engineering controls and work practices associated with the employee's job assignment;

(g) The contents of any compliance program in effect; and

(h) Instructions to employees that chelating agents should not:

(i) Routinely be used to remove lead from their bodies, and

(ii) Be used at all except under the direction of a licensed physician.

(6) The employer shall:

(a) Obtain and include as part of the training program, the materials pertaining to the Federal Occupational Safety and Health Act, the regulations issued under the Act, and this chapter; and

(b) Distribute them to employees.

B. Access to Information and Training Materials

(1) The employer shall make readily available to all affected employees a copy of this chapter.

(2) The employer shall provide to the Department upon request, all materials relating to the employee information and training program.

.14 Signs

A. General

(1) The employer may use signs required by other statutes, regulations, or ordinances in addition to, or in combination with, signs required by this regulation.

(2) The employer shall ensure that no statement appears on or near any sign required by this regulation which contradicts or detracts from the meaning of the required sign.

B. Signs

(1) The employer shall post the following warning sign in each work area where the PEL is exceeded:

WARNING

HAZARD

LEAD WORK AREA

NO SMOKING, EATING OR DRINKING

(2) The employer shall ensure that signs required by this regulation are illuminated and cleaned as necessary so that the legend is readily visible.

.15 Recordkeeping

A. Initial Determination and Exposure Monitoring

(1) The employer shall establish and maintain an accurate record of:

(a) Initial determinations; and

(b) All monitoring required in Regulation .04.

(2) This record shall include:

(a) The information required in Regulation .04;

(b) For each sample taken:

(i) The date, or dates,

(ii) The number of samples,

(iii) The duration of sampling,

(iv) The location,

(v) The results on each sample taken, and

(vi) Where applicable, a description of the sampling procedure used to determine representative employee exposure;

(c) A description of the sampling and analytical methods used and evidence of their accuracy;

(d) The type of respiratory protective devices worn, if any;

(e) Name, social security number, and job classification of the employee monitored and of all other employees whose exposure the measurement is intended to represent; and

(f) The environmental variables that could affect the measurement of employee exposure.

(3) The employer shall maintain the initial determination and exposure monitoring records for the longer of:

(a) 40 years; or

(b) The duration of employment plus 20 years.

B. Medical Surveillance

(1) The employer shall establish and maintain an accurate record for each employee subject to medical surveillance as required by Regulations .10 and .11.

(2) This record shall include:

(a) The name, social security number, and a description of the duties of the employee;

(b) One copy of each physician's written opinion;

(c) Results of any airborne exposure monitoring conducted for that employee and the representative exposure levels supplied to the physician; and

(d) Any employee medical complaints related to exposure to lead.

(3) The employer shall keep, or ensure that the examining physician keeps, the following medical records;

(a) A copy of the medical examination results, including medical and work history, required under Regulations .10 and .11.

(b) A description of the laboratory procedures together with a copy of any standards or guidelines used to interpret the test results or references to that information; and
(c) A copy of the results of biological monitoring.

(4) The employer shall maintain or ensure that the physician maintains the medical records for at least 40 years, or for the duration of employment plus 20 years, whichever is longer.

C. Medical Removals

(1) The employer shall establish and maintain an accurate record for each employee removed from current exposure to lead pursuant to Regulation .12.

(2) Each record shall include:

(a) The name and social security number of the employee;

(b) The date of each occasion on which the employee was removed from exposure to lead, together with the corresponding date on which the employee was returned to his or her former job status;

(c) A brief explanation of how each removal was, or is being, accomplished; and

(d) A statement with respect to each removal indicating whether the reason for the removal was an elevated blood lead level.

(3) The employer shall maintain each medical removal record for at least the duration of an employee's employment.

D. Availability

(1) Upon request, the employer shall make all records required by this chapter available to the Department for examination and copying.

(2) Upon request, the employer shall make environmental monitoring, biological monitoring, and medical removal records required by this chapter available to affected employees or their authorized employee representative for inspection and copying.

(3) Upon request, the employer shall make an employee's medical records required to be maintained by this regulation available to the affected employee or former employee, or to a physician or other individual designated by the affected or former employee for examination and copying.

E. Transfer of Records

(1) When the employer ceases to do business:

(a) The successor employer shall receive and retain all records required by this chapter.

(b) If there is no successor employer to receive the records required by this chapter and to retain them for the prescribed retention period, the employer shall transmit these records to the Department.

(2) At the expiration of the record retention period prescribed by this chapter, the employer shall:

(a) Notify the Department at least 3 months before the disposal of the records; and

(b) Transmit the records to the Department if requested within the period.

.16 Observation of Monitoring

A. Employee Observation

The employer shall provide affected employees or their designated representative an opportunity to observe monitoring of employee exposure to lead conducted pursuant to Regulation .04.

B. Observation Procedures

(1) When observation of the monitoring of employee exposure to lead requires entry into an area where the use of respirators, protective clothing, or equipment is required, the employer shall:

(a) Provide the observer with and ensure the use of the respirators, clothing, and equipment; and

(b) Require the observer to comply with all other applicable safety and health procedures.

(2) Without interfering with the monitoring, observers shall be entitled to:

(a) Receive an explanation of the measurement procedures;

(b) Observe all steps related to the monitoring of lead performed at the place of exposure; and

(c) Record the results obtained or receive copies of the results when returned by the laboratory.

605578 - REPLACING STEEL RIVETS/BOLTS

Description:

The item shall consist of furnishing all materials and replacing the rusted/deteriorated rivets of the structural members with bolts in accordance with the notes and details on the Plans and/or as directed by the Engineer.

Materials and Construction Methods:

Bolts shall be high strength friction type bolts, nuts, and washers conforming to the requirements of ASTM A325. High strength bolts, nuts, and washers shall be mechanically galvanized; and coating thickness, adherence and quality requirements shall be as specified in Class C of ASTM A153.

The Plans provide guidelines for the determination of when rivets shall be replaced with high strength bolts. Where a group of rivets is being replaced, one rivet at a time shall be removed and immediately replaced with a bolt before the next rivet is removed.

Basis of Payment:

The payment for the item shall be made for at the contract unit price bid per Each for 605578, "Replacing Steel Rivets", which price and payment shall constitute full compensation for furnishing all materials, removing the rusted rivets as directed and replacing with high strength steel bolts, disposing of discarded materials, for all labor, equipment, tools, and incidentals necessary to complete the work.

8/28/02

605581 - ELASTOMERIC BEARING PADS

Description:

The item shall consist of installing new elastomeric bearing pads in accordance with the locations, notes on the plans and as directed by the Engineer.

Materials:

The bearing pads shall conform to the requirements of elastomeric bearing pads as described under Section 605 of the Standard Specifications and AASHTO Standard Specifications for Highway Bridges, Section 18, Division II.

Construction Methods:

The existing bearing pad shall be removed and disposed of, and the area shall be cleaned of dirt, grease and other foreign matter.

The bearing pad shall be installed in accordance with the requirements of Section 605 and AASHTO Standard Specifications for Highway Bridges, Section 18, Division II.

Basis of Payment:

The payment for the bearing pad shall be made for at the contract unit price bid per Each for "Elastomeric Bridge Bearing Pads", which price and payment shall constitute full compensation for furnishing and installing all material, removal and disposal of the existing pad, for all labor, tools, equipment and necessary incidentals to complete the work.

9/30/04

605585 - STEEL STRUCTURE REPAIR

Description:

This work consists of furnishing, fabricating, and erecting all structural steel for the repair of the structure in accordance with notes and details on the Plans, Section 605 and directions from the Engineer.

Materials:

As indicated on the Plans and Section 605.

Construction Methods:

As indicated on the Plans and Section 605.

Method of Measurement:

The quantity of steel structure repair will not be measured.

Basis of Payment:

The quantity of steel structure repair will be paid for at the Contract lump sum. Price and payment will constitute full compensation for furnishing all materials, removal of existing steel, fabricating and erecting structural steel and for all labor, equipment, tools and incidentals required to complete the work.

8/30/04

605607 - JACKING BRIDGE

Description:

This work includes the jacking of existing bridge as indicated on the Plans and as specified herein, or as directed by the Engineer.

Materials:

Jacks used for jacking operations shall have the rate capacity shown clearly on the manufacturer's name plate attached to each jack.

Construction Methods:

All field welding shall be done by the shielded metal-arc process. All requirements of the Specifications shall be adhered to, except that the requirements for radiographic and ultrasonic inspection will be waived if a visual inspection by the Engineer indicates the welds are satisfactory.

Areas under the jacks shall be thoroughly cleaned to provide a flat, clean jacking surface.

It is the Contractor's sole responsibility to ensure that he uses the correct scheme and jack capacity as shown on the Plans. Therefore, any damage resulting from the Contractor's misuse of the jacking scheme to any portion of the existing structure that is to remain in place shall be repaired by him to the complete satisfaction of the Engineer, all at the Contractor's sole cost.

When no longer required, as determined by the Engineer, all materials used for the temporary supports shall become the property of the Contractor and shall be disposed of by him clear of the site.

Jacking Requirements and Restrictions -

The following requirements and restrictions shall be closely adhered to by the Contractor during jacking sequences.

The Engineer or his representative shall be present during all jacking operations and shall check all pertinent dimensions and requirements as set forth on the Plans and herein to ensure that all pertinent stipulations are met before commencement of the actual jacking.

Jacks with a higher capacity than those listed in the Plans may be allowed, but the Contractor shall be responsible for monitoring the jack load to ensure the safety of the structure.

The jack system shall be equipped with a gage to directly read the jack force in pounds or kips or shall be accompanied by a chart with which the dial reading can be converted into pounds. Direct reading gages are preferred.

The maximum jacking forces shown on the plans shall not be exceeded.

The jack hydraulics may not be used to support the load after jacking. All load must be transferred to the jacking beam and stool supports after jacking.

Method of Measurement and Basis of Payment:

Jacking, including all materials, labor, and equipment necessary for jacking the existing bridge and removing the jacking assemblies, will be measured and paid for at the contract Lump Sum price bid for the item 605607 - Jacking Bridge.

This item includes jacking bearing plates, hydraulic jacks, any temporary blocking or shims, all labor and any additional materials required to jack existing bridge.

605706 - FURNISHING AND INSTALLING COMPRESSION SEAL

Description:

This work consists of furnishing and installing preformed compression seal expansion joints in accordance with the Plans, this Special Provision, the manufacturers recommendations and as directed by the Engineer.

Materials:

The preformed compression seal material shall be 100% virgin Polychloroprene (Neoprene), shall meet the requirements of ASTM D3542 and AASHTO M297, and shall have the following physical properties as determined by the applicable ASTM tests:

ASTM Standard	Physical Properties	Performance Requirements
D2240 (Modified)	Hardness	60± points, Durometer (Type A)
D412	Tensile Strength Ultimate Elongation	2000 psi, min. 250%, min.
D573	Heat Resistance (oven aging) (70 hrs. @212 degrees F.) Change in durometer hardness Change in tensile strength Change in ultimate elongation	 0 to +10 pts. max. -20%, max. -20%, max.
D1360	Abrasion Resistance	Index of 200 or greater permissible
D1149	Ozone Resistance 20% strain, 300 pphm in air, 70h @140 degrees F. wiped with toluene to remove surface contamination	No cracks
D471	Oil Swell, ASTM Oil #3, 70h @ 212 degrees F., Weight change	45%, max.
D2240	Low Temperature Stiffening, max 7 days @ 14 degrees F.	+15 points Durometer (Type A)

Adhesive for installing the compression seal shall be supplied by the same manufacturer supplying the compression seal.

Construction Methods:

All concrete surfaces to receive compression seal shall be free from dirt, oil and any other loose foreign debris which may be detrimental to effective joint sealing. Spalls and cracks shall be repaired as directed by the Engineer to form clean joint opening with sharp edges.

The Contractor shall follow the manufacturer's recommendations in surface preparation, application of adhesive, and installation of the compression seal. Any contradiction found between these Special Provisions and the manufacturer's recommendation, the latter will prevail.

Method of Measurement:

The quantity the specified size of compression seal will be measured as the actual number of linear feet furnished and installed, measured along the centerlines of the slab joints.

Basis of Payment:

The quantity of compression seal joint repair will be paid for at the Contract unit price per linear foot. Price and payment will constitute full compensation for fabricating, furnishing and installing all materials, labor, equipment and all necessary incidentals to complete the work.

12/8/15

606508 - STEEL HAND RAIL REPAIR

Description:

This work consists of furnishing all materials necessary to repair the existing hand railing in accordance with the requirements and notes indicated on the Plans and/or as may be directed by the Engineer and these Special Provisions.

Materials:

All materials required for the repair of the hand railing including hand rail tubes, posts, plates, bolts and connections shall be new and conform to the applicable requirements of Section 605 of the 2001 Standard Specifications. The timber spacers shall conform to Sections 601 of the 2001 Standard Specifications, and shall be long leaf or short leaf southern yellow pine or close-grained Douglas fir, No. 1 grade or better, cut square and surfaced on four sides.

Construction Methods:

As indicated on the Plans and Sections 601 and 605. The repair of the existing railing shall be completed in such a manner so as to match the size, shape and location of the original components being repaired or replaced. Shop clean and paint all new structural steel components in accordance with Section 605 of the 2001 Standard Specifications. The paint color and coating system shall match that used for the truss.

Method of Measurement:

The quantity of steal handrail repair shall be for plan length of the hand rail by linear feet installed, complete and accepted.

Basis of Payment:

The quantity of steel hand rail repair will be paid for at the Contract unit price per linear feet. The price and payment will constitute full compensation for furnishing and replacing all materials as described herein for repairing the existing hand railing including fabrication and installation of the rail tubes, posts, plates, bolts, timber spacers and connections, removal of existing components, and for all labor, tools, equipment and any incidentals necessary to complete the work as required on the Plans, these Special Provisions and as stipulated by the Engineer.

5/2/17

619520 - DRILLED MICROPILES
619521 - MICROPILE LOAD TEST

Description:

This work consists of furnishing and constructing micropile foundations of the type and dimensions designated in the construction plans and these specifications. This specification also covers installing test piles and performing load tests.

Submittals:

a. Contractor Experience

The micropile Contractor shall be experienced in the construction and load testing of micropiles and have successfully constructed at least 5 projects in the last 5 years involving Type B micropiles of similar capacity to those required in the Contract Documents.

The Contractor shall have previous micropile drilling and grouting experience in soil similar to the project conditions. The Contractor shall submit construction details, structural details and load test results for at least 3 previous successful micropile load tests from different projects of similar scope to this project.

The Contractor shall assign an Engineer to supervise the work with experience on at least 3 projects of similar scope to this project, completed over the past 5 years. The Contractor's on-site foremen and drill rig operators shall also have experience on at least 3 projects over the past 5 hears installing micropiles of equal or greater capacity than required in the Contract Documents.

At least 30 calendar days before the planned start of micropile construction, the Contractor shall submit 3 copies of the completed projects reference list and personnel list. The project reference list shall include a brief project description with the Owner's name and current contact information and load test reports. The personnel list shall identify the supervising project Engineer, drill rig operators, and on-site foremen to be assigned to the project. The personnel list shall contain a summary of each individual's experience in a complete and concise resume format.

b. Construction submittals

The Contractor shall prepare and submit 3 copies of the following for the micropile system to be constructed:

i. Proposed start date and micropile installation schedule.
ii. Step-by-step description of the proposed micropile construction procedure, including personnel, testing and equipment to assure quality control.
iii. Working drawings provided by the Contractor shall include micropile installation details giving:
- Micropile location and pattern
- Micropile design load - Factored Resistance and Service Resistance
- Maximum deflection of piles at design load - Horizontal and Vertical
- Type and size of reinforcing steel and permanent casing
- Minimum total bond length
- Total micropile length
- Tip elevation
- Minimum required grout strength
- Grouting volumes
- Micropile top attachment
- Micropile cut-off elevation
- Anticipated ground conditions

iv. Shop drawings shall be submitted for review and acceptance for details not shown on Contract Drawings such as casing threads and centralizer details.
v. Information on headroom and space requirements for installation equipment that verify the proposed equipment can perform at the site.

vi. Plan describing control, containment and disposal of surface water, drill flush and grout, including excess waste grout, in accordance with applicable permits and to protect Broad Creek from contamination.

vii. Certified mill test reports, for the reinforcing steel shall be submitted for record purposes as the materials are delivered. The ultimate strength, yield strength, elongation, and chemical analyses shall be included. For steel pipe used as permanent pipe/casing, or core steel, a minimum of two representative coupon tests or mill certifications shall be submitted on each load delivered to the project.

viii. Proposed Grouting Plan. The grouting plan shall include complete descriptions, details, and supporting calculations for the following:

a. Grout mix design and type of materials to be used in the grout including certified test data and trial batch reports.

b. Methods and equipment for monitoring recording the grout depth, grout volume and grout pressure during placement.

c. Estimated curing time for grout to achieve specified strength. Previous test results for the proposed grout mix completed within 1 year of the start of grouting may be submitted for initial verification and acceptance.

d. Procedure and equipment for Contractor monitoring of grout quality.

ix. The Contractor shall submit for review and acceptance detailed plans for the method proposed for testing of micropiles prior to any testing. The plans shall include all necessary drawings and details to clearly describe the equipment proposed.

x. The Contractor shall submit calibration reports for each test jack, pressure gauge and master pressure gauge to be used. The calibration tests shall be performed by an independent testing laboratory. Calibration of pressure gauges shall be within six months prior to the date submitted. Testing shall not commence until these calibrations have been approved.

Work shall not begin until the appropriate submittals have been approved in writing.

c. Installations Records

A pile installation record shall be submitted by the Contractor within 24 hours after each pile installation is completed. As a minimum, the record shall include the following information:

- Pile drilling duration and observations
- Description of soil and rock encountered
- Approximate final tip elevation
- Cut-off elevation
- Description of unusual behavior/conditions
- Deviations from planned parameters
- Grout volumes pumped
- Pile materials and dimensions
- Load test records, analysis and details

In addition, as built drawing showing the location of piles, their depth and inclination, details of composition, shall be submitted by the Contractor.

d. Pre-Construction Meeting

A pre-construction meeting will be held prior to the start of micropile construction. The Department Representative, Design Engineer, Construction Manager, Prime Contractor and Micropile Specialty Sub-Contractor shall be in attendance. The pre-construction meeting will be conducted to clarify the construction requirements, coordinate schedule and identify responsible parties pertaining to the micropile installation and testing, survey control and site erosion and sedimentation control.

Materials:

a. Water

Water for mixing grout shall conform to the discontinued AASHTO T 26-79 (2008) and be potable, clean and free from substances which may be in any way deleterious to grout or steel.

b. Admixtures

Admixtures shall conform to the requirements of AASHTO M194. Expansive admixtures shall only be added to grout used for filling sealed encapsulations. Admixtures shall be compatible with the grout and mixed in accordance with the manufacturer's recommendations. Their use will only be permitted after field tests on fluid and set grout properties. Admixtures with chlorides shall not be permitted.

c. Cement

All cement shall be Portland cement conforming to AASHTO M85, Types I or II.

d. Fine Aggregate

Sand may be used in the grout mix when directed by the Department and shall conform to AASHTO M45.

e. Bar Reinforcement

Reinforcing steel shall be #20 solid deformed bars conforming to AASHTO M31, Grade 75.

For cases of tensile loading, bar couplers, if required, shall develop the ultimate tensile strength, of the bar, without any evidence of failure. For compressive loading, the coupler shall be compatible with efficient load transfer and overall reinforcement performance requirements.

f. Pipe/Casing

The permanent steel pipe/casing shall meet the tensile requirements of ASTM A252, Grade 3, except the yield strength shall be as used in the design submittal equal to 80 ksi minimum yield strength and minimum elongation shall be 15%.
Pipe casing shall be either:

1. New "structural Grade" or "Mill Secondary" steel pipe/casing without Mill Certification, provided it is free from defects (dents, cracks, tears) and has a minimum of two coupon tests per truckload, or
2. "Prime" steel pipe/casing meeting the requirements of ASTM A252 or API 5CT (API, 1998).
3. "Prime" steel pipe/casing meeting the tensile requirements of ASTM A252, Grade 3, except the yield strength shall be as used in the design submittal equal to 80 ksi minimum yield strength and minimum elongation shall be 15%.

If welding of high strength steel pipe/casing is required, a welding procedure prepared by a welding specialist shall be submitted for review and written approval by the Engineer, prior to any welding operation.

Pipe/casing splices or threads shall provide proper alignment so that no eccentricity or angle occurs between the axis of the two lengths spliced.

Flush joint casing threads will be used. (These threads have a bending strength of approximately 50% of the solid casing, tension strength of approximately 50% of the solid casing and near full compression strength.) Adequate compression strength will be proven by the load tests.

g. Plates and Shapes

Structural steel plates and shapes for pile top attachments shall conform to AASHTO M270/M270M (ASTM A709/A 709M), Grade 50, or as specified in the construction plans or on the working drawings.

h. Centralizers

Centralizers shall be fabricated from plastic, steel, or material that is non-detrimental to the reinforcing steel. Wood shall not be used.

Centralizers shall permit the free flow of grout without misalignment of the reinforcement.

Construction:

a. Site Drainage Control

The Contractor shall control, contain and properly dispose of drill flush and construction related waste, including grout, in accordance with the standard specifications and all applicable local codes and regulations. Install and maintain containment measures necessary to prohibit contamination of Broad Creek from construction related waste. Provide positive control and discharge of all surface water that will affect the micropile installation. If provisions of the Site Drainage Control include items outside of the current DNREC permit, the Contractor will be responsible to modify the permit.

b. Installation

The micropile Contractor shall select the drilling method and grouting procedures used for the installation of the micropiles. The drilling equipment, methods and sequence shall be suitable for drilling through the conditions to be encountered. The borehole must be open to the defined nominal diameter, full length, prior to placing grout and reinforcement.

Final tip elevation and bond length will be defined by the Engineer.

All installation techniques shall be determined and scheduled such that there will be no interconnection or damage to piles in which grout has not achieved final set.

Centralizers shall be provided at 10 ft. maximum spacing on central reinforcement. The uppermost centralizer shall be located a maximum of 5 ft. from the top of the central reinforcement.

The central reinforcement steel with centralizers shall be dropped into the stabilized drill holes to the desired depth without difficulty. Partially inserted reinforcing bars shall not be driven or forced into the hole.

The Contractor shall check pile top elevations and cutoff all installed micropiles to the planned elevations.

c. Grouting

The Contractor shall provide calibrated systems and equipment to measure the grout quality, quantity, and pumping pressure during the grouting operations.

After drilling, the hole shall be flushed with water and/or air to remove drill cuttings and/or other loose debris.

The Contractor shall provide a stable, homogenous neat cement grout with a minimum 28-day unconfined compressive strength of 4,000 psi. Previous test results for the proposed grout mix, completed within one year of the start of work may be submitted for initial verification of the required compressive strength of pre-production verification test piles. Grout within the verification and proof test piles shall attain the minimum required 3-day compressive strength of 2,000 psi prior to load testing. During production, the Contractor shall test one set of three 2 inch by 2 inch grout cubes in accordance with AASHTO T106 from each grout plant, each day of operation, or for every 10 piles, whichever is more frequent. The compressive strength shall be the average of the three cube set. The grout shall not contain lumps or any other evidence of poor or incomplete mixing. Admixtures, if used, shall be mixed in accordance with manufacturer's recommendations. The pump shall be equipped with a pressure gauge to monitor grout pressures. The pressure gauge shall be capable of measuring pressures of at least 150 psi or twice the actual grout pressures used by the Contractor, whichever is greater. The grouting equipment shall be sized to enable the grout to be pumped in one continuous operation. The grout should be kept in constant agitation prior to pumping.

The grout shall be injected from the lowest point of the drill hole (by tremie methods) until clean, pure grout flows from the top of the micropile. The tremie grout may be pumped through grout tubes, hollow stem augers, or drill rods. Subsequent to tremie grouting, all grouting operations associated with, for example, extraction of drill pipe/casing and pressure grouting, must ensure complete continuity of the grout column. The use of compressed air to directly pressurize the fluid grout is not permissible. The entire pile shall be grouted to the design cut-off level.

Grout within the micropiles shall be allowed attain the minimum design strength prior to being loaded.

d. Tolerances

a) Centerline of piling shall not be more than 3 inches from indicated plan location.
b) Pile-hole Alignment shall be within 2% of design alignment.
c) Top elevation of pile shall be within +1 inch to -2 inches of the design vertical elevation.
d) Centerline of core reinforcement shall not be more than ¾ inch from centerline of piling.

Load Testing:

Perform one (1) verification and two (2) proof tests of the piles at the location specified on the Contract Documents. Perform compression load testing in accordance with ASTM D1143. No lateral load testing will be required.

Allow three (3) days minimum for the grout to cure before any testing.

a. Verification Load Tests (Pre-Production testing)

The number of verification test piles and their locations shall be as identified in the contract documents.

The micropile load testing procedure is defined below and shall be performed in general conformance with ASTM D1143. Contractor shall submit for approval the minimum following information:

- Type of apparatus for measuring load
- Type of apparatus for applying load
- Type of apparatus for measuring the pile deformation
- Type and capacity of reaction load system, including drawings signed and sealed by a Professional Engineer, registered in the State of Delaware.
- Calibration reports for hydraulic jack

The micropile load test results shall verify the suitability of the design and installation methods, and shall be reviewed and accepted by the Engineer prior to the Contractor's initiation of production micropile installation.

The drilling and grouting methods, pipe/casing and other reinforcement details, and depth of embedment for the test pile(s) shall be identical to the production piles, except where approved otherwise by the Engineer.

The test micropiles shall be loaded to 200% of the unfactored design load (DL) with the unfactored design load equal to 68.5 tons. The jack shall be positioned at the beginning of the test such that the unloading and repositioning of the jack during the test will not be required. Piles shall be tested under compression loads. An Alignment Load (AL) may be applied to the pile prior to setting the movement recording devices. This Alignment Load shall be no more than 0.05 DL. Dial gauges shall be zeroed at the first setting of AL.

Axial verification pile load tests shall be made by loading the micropile in the steps shown in Table 1 and recording the head movement at each step. For sacrificial test piles (not to be later used in service), further load cycles may be conducted to failure.

Measurement of pile movement shall be obtained at each increment. The load hold period shall start as soon as the test load is applied. The verification test pile shall be monitored for creep at the 1.30 DL. Pile movement with respect to a fixed reference, during the creep test shall be measured and recorded at 1, 2, 3, 4, 5, 6, 10, 20, 30, 50 and 60 minutes.

The acceptance criteria for micropile verification load tests are:

1. The pile shall sustain DL with no more than the specified permissible total vertical movement at the top of the pile as measured relative to the top of the pile prior to the start of testing is the following:

Cased pile length	Permissible Deflection
(feet)	(inches)
50	0.3
100	0.5
150	0.75

If an Alignment Load is used, then the allowable movement will be reduced by multiplying by a factor of (DL-AL)/DL.

2. Test piles shall have a creep rate at the end of the 1.30 DL increment which is not greater than 1/32 inch /log cycle time (1-10 minutes) or 1/16 inch /log cycle time (6-60 minutes) and has a linear or decreasing creep rate.
3. Failure does not occur by 2.0 DL. Failure is defined as a slope of the load versus deflection (at end of increment) curves exceeding 0.025 inch/kip.

Load steps for Verification Load Testing:

TABLE 1

INT.	LOAD	HOLD TIME (Min.)
1	AL	2.5
2	0.15 DL	2.5
3	0.30 DL	2.5
4	0.45 DL	2.5
5	AL	1
6	0.15 DL	1
7	0.45 DL	1
8	0.60 DL	2.5
9	0.75 DL	2.5
10	0.90 DL	2.5
11	1.00 DL	2.5
12	AL	1
13	0.15 DL	1
14	1.00 DL	1
15	1.15 DL	2.5
16	1.30 DL	10 to 60
17	1.45 DL	2.5
18	AL	1
19	0.15 DL	1
20	1.45 DL	1
21	1.60 DL	1
22	1.75 DL	2.5
23	1.90 DL	2.5
24	2.00 DL	10
25	1.50 DL	5
26	1.00 DL	5
27	0.50 DL	5
28	AL	5

b. Proof Load Tests

The number of proof load tests and their locations shall be as identified in the contract documents. Perform proof load tests on the first set of production piles installed at each substructure unit prior to the installation of the remaining production piles at the respective location. Test piles designated for compression load testing to a maximum test load of 1.60 DL (DL = 68.5 tons for South Abutment; and, DL = 124 tons for Wall Pier)

The acceptance criteria for micropile proof load tests are:

1. The pile shall sustain DL with no more than the specified permissible total vertical movement at the top of the pile as measured relative to the top of the pile prior to the start of testing is the following:

Cased pile length	Permissible Deflection
(feet)	(inches)
50	0.3
100	0.5
150	0.75

If an Alignment Load is used, then the allowable movement will be reduced by multiplying by a factor of (DL-AL)/DL.

2. Test piles shall have a creep rate at the end of the 1.30 DL increment which is not greater than 1/32 inch /log cycle time (1-10 minutes) or 1/16 inch /log cycle time (6-60 minutes) and has a linear or decreasing creep rate.
3. Failure does not occur by 1.60 DL. Failure is defined as a slope of the load versus deflection (at end of increment) curves exceeding 0.025 inch/kip.

Load steps for Proof Load Testing:

TABLE 1		
INT.	LOAD	HOLD TIME (Min.)
1	AL	2.5
2	0.15 DL	2.5
3	0.30 DL	2.5
4	0.45 DL	2.5
5	0.60 DL	2.5
6	0.75 DL	2.5
7	0.90 DL	2.5
8	1.00 DL	2.5
9	1.15 DL	2.5
10	1.30 DL	10 to 60
11	1.45 DL	2.5
12	1.60 DL	2.5
13	1.30 DL	4
14	1.00 DL	4
15	0.75 DL	4
16	0.50 DL	4
17	0.25 DL	4
18	AL	4

The Contractor shall submit a written report providing micropile geometry and construction details with seven (7) working days after the completion of the load tests.

If any of the micropile load tests fail(s) to meet the design requirement, the cause(s) shall be established and the micropile design and/or installation methods shall be modified by the micropile designer and the new system shall be retested as directed by the Engineer.

Any modification which requires changes to the structure shall have prior review and acceptance of the Engineer. The cause for any modifications of design or construction procedures shall be decided in order to appropriately determine any additional cost implications.

Method of Measurement:

Measurement will be made as:

a. 9.625" x 0.472" Micropiles – Linear Foot. Measured from the bottom of the bond zone (final tip elevation) to the cutoff elevation. Includes associated costs of furnishing, drilling, grouting, center bar reinforcement, micropile casing, cutting off, splicing, rebuilding or extending, and excavation necessary for splicing, rebuilding or extending.
b. Micropile Load Test - Includes the cost of One (1) Verification Pile Load Test – as indicated; and, Two (2) Proof Pile Load Tests – 1 per substructure unit, as indicated.

Basis of Payment:

Pay Item	Unit
Drilled Micropiles	Linear Foot (LF)
Micropile Load Test	Each (EA)

The micropile Contractor is responsible for estimating grout take. No additional payment will be made for grout overruns.

Non-Conforming Piles:

Non-conforming piles include piles that are installed out of tolerance, are damaged, the volume of grout is less than the theoretical volume of the hole, or the pile is not installed to specified bearing stratum. The Engineer will reject non-conforming micropile(s). The Contractor may be required to replace rejected micropiles as directed, at no additional cost to the Department.

4/21/17

710506 - ADJUST AND REPAIR EXISTING SANITARY MANHOLE

Description:

This work consists of adjusting and repairing existing sanitary manholes in accordance with notes and details on the Plans and as directed by the Engineer.

Materials and Construction Methods:

Materials and construction methods shall conform to the applicable requirements of Section 710 of the Standard Specifications, and the Standard Specifications of the owner of the sewer system. If there is a conflict between the Department's Specifications and the Specifications of the owner, the latter will prevail.

Method of Measurement and Basis of Payment:

The method of measurement and basis of payment for the item shall be made in accordance with Subsections 710.09 and 710.10 of the Standard Specifications.

8/28/01

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	
	WHITE:	**YELLOW:**
Pigments	Titanium Dioxide - 18% Min. (ASTM D476, Type II)	Organic Yellow - 6%-10%
Epoxy Resin	75% Min., 82% Max.	70% Min., 77% Max.

The entire pigment composition shall consist of either titanium dioxide and/or organic yellow pigment. No extender pigments are permitted. The white pigment upon analysis, shall contain a minimum of 16.5% TiO_2 (100% purity).

Epoxy Content-WPE (Component A) - The epoxy content of the epoxy resin will be tested in accordance with ASTM D1652 and calculated as the weight per epoxy equivalent (WPE) for both white and yellow. The epoxy content will be determined on a pigment free basis. The epoxy content (WPE) shall meet a target value provided by the manufacturer and approved by the Department's Material and Research Section (from now on will be addressed as Department). A $\pm$ 50 tolerance will be applied to the target value to establish the acceptance range.

Amine Value (Component B) - The amine value of the curing agent shall be tested in accordance with ASTM D2074-66 to determine its total amine value. The total amine value shall meet a target value provided by the manufacturer and approved by the Department. A $\pm$50 tolerance will be applied to the target value to establish the acceptance range.

Toxicity - Upon heating to application temperature, the material shall not exude fumes which are toxic or injurious to persons or property.

Viscosity - Formulations of each component shall be such that the viscosity of both components shall coincide (within 10%) at a recommended spray application.

2. Physical Properties of Mixed Composition:

Unless otherwise noted, all samples are to be prepared and tested at an ambient temperature of 73 ± 5 °F. (23 ± 3 °C).

a. Color. The white epoxy composition when applied at a minimum wet film thickness of 20$\pm$1 mils (500 µm) as applicable and allowed to dry, shall plot within the boundaries described by the four corner points listed in Tables 1 and 2 of ASTM D 6628-01 when measured in accordance with the test methods prescribed in Section 7 of ASTM D 6628-01.

The yellow epoxy composition when applied at a minimum wet film thickness of 20$\pm$1 mils (500 µm) as applicable and allowed to dry, shall plot within the boundaries described by the four corner points listed in Tables 1 and 2 of ASTM D 6628-01 when measured in accordance with the test methods prescribed in Section 7 of ASTM D 6628-01.

b. Directional Reflectance. The white epoxy composition (without glass spheres) shall have a daylight directional reflectance of not less than 84% relative to a magnesium oxide standard when tested in accordance with Method 6121 of Federal Test Method Standard No. 141.

The yellow epoxy composition (without glass spheres) shall have a daylight directional reflectance of not less than 55% relative to a magnesium oxide standard when tested in accordance with Method 6121 of Federal Test Method Standard No. 141.

c. Drying Time (Laboratory). The epoxy composition, when mixed in the proper ratio and applied at a 20$\pm$1 mils (500 µm) minimum wet film thickness, and immediately dressed with large reflective glass spheres (Federal Spec. Type 4)at a rate of 12

lb/gal (1.4 kg/l) of epoxy pavement marking materials, immediately followed by a second drop of AASHTO M-247 Type 1 glass spheres applied at a rate of 12 lb/gal (1.4 kg/L) of epoxy pavement marking material, shall exhibit a no-track condition in 15 minutes or less (ASTM D711). A Bird Applicator or any other doctor blade shall be used to produce a uniform film thickness.

d. Drying Time (Field). When installed at a minimum wet film thickness of 20±1 mils (500 or 625 um) and reflectorized with glass spheres, the maximum drying times shall correspond to these temperatures:

80°F (27°C)	10 minutes
70°F (21°C)	10 minutes
60°F (16°C)	15 minutes
50°F (10°C)	25 minutes
40°F (4°C)	45 minutes
35°F (2°C)	60 minutes

The composition shall dry to "no-tracking" in approximately 10 minutes, and after thirty (30) minutes shall show no damaging effect from traffic. Dry to ″no-tracking″ shall be considered as the condition where no visual deposition of the epoxy marking to the pavement surface is observed when viewed from a distance of 100 feet (30 meters), after a passenger car is passed over the line. Regardless of the temperature at the time of installation, the installation contractor shall be responsible for protection of the markings material until dry to a non-tracking state.

e. Abrasion Resistance. The wear index of the composition shall not exceed 82 when tested in accordance with ASTM C501 using a CS-17 wheel and under a load of 1000 grams for 1000 cycles.

f. Tensile Strength. The tensile strength of the epoxy composition shall not be less than 6000 psi (41 MPa) when tested in accordance with ASTM D638 using a Type IV specimen [0.125" ± 0.010" (3.18 ± 0.25 mm) thick]. Tests shall be conducted at an ambient temperature of 75 ± 5°F (24 ± 3°C). The testing machine shall operate at a speed of 0.20" (5.1 mm) per minute.

The total conditioning or drying period, from the time the epoxy composition is first mixed to the time of testing, shall not be less than 24 hours nor more than 96 hours.

Test specimens for tensile strength determination will be prepared as follows:

A 1/8 inch (3 mm) thick sheet of epoxy material is cast from a reservoir-type mold, fabricated from polyterrafluorethylene (PTFE), 1/8" deep x 10" x 10" (3 mm deep x 250 mm x 250 mm).

Prior to casting, the mold is sprayed with a suitable release agent. A sufficient amount of epoxy composition is mixed in the proper proportions (A:B) and poured level with the top of the mold. Care should be taken so as not to decrease or exceed the 1/8" (3 mm) thickness.

After a period of 1 to 4 hours, the material will have set into a semi-rigid sheet that is flexible enough to die-cut yet rigid enough to retain its shape. While the material is in this "plastic" state, five (5) specimens shall be die-cut and then placed on a flat, smooth, PTFE surface for the completion of the specified conditioning period.

g. Compressive Strength. The compressive strength of the epoxy composition shall not be less than 12,000 psi (83 MPa) when tested in accordance with ASTM D695 except that a compression tool shall not be necessary. The test specimen shall be a right cylinder [0.50 inch diameter by 1.0 inch length (12 mm diameter by 25 mm length)]. Tests shall be conducted at an ambient temperature of 75 ± 5°F (24 ± 3°C).

The total conditioning or drying period, from the time the epoxy composition is first mixed to the time of testing shall not be less than 24 hours nor more than 96 hours.

Test specimens for compressive strength determinations will be prepared as follows:

Five molds will be prepared from 1/2" (12 mm) I.D., 1/16" (1.5 mm) wall thickness acrylic tubing, cut in 1 1/2" (38 mm) lengths. After spraying the inside of the mold with a suitable release agent,(1) the cylindrical tubes are placed in a vertical position on a PTFE sheet base. A sufficient amount of epoxy composition is thoroughly mixed in the proper proportions (A:B) and poured into the mold to a depth of approximately 1 1/4" (32 mm). After a minimum of 72 hours curing, the specimens are removed from the molds and machined to a length of 1" ± 0.002" (25 mm ± 0.05 mm).

h. Hardness. The epoxy composition when tested in accordance with ASTM D2240 shall have a Shore D hardness of between 75 and 100. Samples shall be allowed to dry for not less than 24 hours nor more than 96 hours prior to testing.

B. Reflective Glass Spheres/Beads

Reflective glass spheres for drop-on application shall conform to the following requirements:

The glass spheres shall be colorless; clean; transparent; free from milkiness or excessive air bubbles; and essentially clean from-surface scarring or scratching. They shall be spherical in shape and at least 80% of the glass beads shall be true spheres when tested in accordance with ASTM D1155. At least 80% of the Type IV beads shall be true spheres as measured by the visual method.

The refractive index of the spheres shall be a minimum of 1.50 as determined by the liquid immersion method at 77°F (25°C).

The silica content of the glass spheres shall not be less than 60%.

The crushing resistance of the spheres shall be as follows: A 40 lb. (18 kg) dead weight, for 20 to 30 (850 µm to 600 µm) mesh spheres shall be the average resistance when tested in accordance with ASTM D1213.

The glass spheres shall have the following grading when tested in accordance with ASTM D1214.

M247 AASHTO Type 1 Glass Spheres

U.S. Standard Sieve	% Retained	% Passing
#20 (850µm)	0	100
#30 (600µm)	5-25	75-95
#50 (300µm)	40-65	15-35
#100 (150µm)	15-35	0-5
Pan	0-5	

Type 4 Large Spheres

U.S. Standard Sieve	% Retained	% Passing
#10 (2000 µm)	0	100
#12 (1680 µm)	0-5	95-100
#14 (1410 µm)	5-20	80-95
#16 (1190 µm)	40-80	10-40
#18 (1000 µm)	10-40	0-5
#20 (850 µm)	0-5	0-2
Pan	0-2	

The AASHTO M247 Type 1 glass spheres shall be treated with a moisture-proof coating. They shall show no tendency to absorb moisture in storage and shall remain free of clusters and hard lumps. They shall flow freely from dispensing equipment at any time when surface and atmosphere conditions are satisfactory for marking operations. The moisture-resistance of the glass spheres shall be determined in accordance with AASHTO M247 test method 4.4.1.

Type IV glass spheres shall be treated with an adhesion coating. They shall show no tendency to absorb moisture in storage and shall remain free of clusters and hard lumps. They shall flow freely from dispensing equipment at any time when surface and atmosphere conditions are satisfactory for marking operations. The adhesion coating property of the Type IV beads shall be tested in accordance with the dansyl-chloride test.

C. Black Epoxy Contrast Markings

Epoxy Resin Requirements: The two-component, 100% solids, paint shall be formulated and designed to provide a simple volumetric mixing ratio (e.g. 2 part component A to 1 part component B) specifically for service as a hot-spray applied binder for black aggregate in such a manner as to produce maximum adhesion. The material shall be composed of epoxy resins and pigments only.

The paint shall be well mixed in the manufacturing process and shall be free from defects and imperfections that may adversely affect the serviceability of the finished product. The paint shall not thicken, curdle, gel, settle excessively, or otherwise display any objectionable properties after storage. Individual components shall not require mixing prior to use when stored for a maximum of 6 months.

The overall paint composition shall be left to the discretion of the manufacturer, but shall meet the following requirements:

Composition:	Component	Percent By Weight
	Carbon Black (ASTM D476 Type III)	7±2 percent, by weight
	Talc	14±2 percent, by weight
	Epoxy Resin	79±4 percent, by weight

D. Black Aggregate

The moisture resistant aggregate shall meet the gradation requirements (AASHTO T27) as follows:

Sieve Size	Percent Retained
#30	18-28%
#40	60-80%
#50	2-14%

The moisture resistant aggregate shall have a ceramic coating. The aggregate shall be angular with no dry dispensement pigment allowed.

Hardness:	The black aggregate hardness shall be 6.5-7 on Moh's Mineral Scale.
Porosity:	The black aggregate porosity shall be less than two (2) percent.
Moisture Content:	The black aggregate moisture content shall be less than a half (.5) percent.

E. Packaging and Shipment

Epoxy pavement marking materials shall be shipped to the job site in strong substantial containers. Individual containers shall be plainly marked with the following information:

a. Name of Product
b. Lot Number
c. Batch Number
d. Test Number
e. Date of Manufacture
f. Date of expiration of acceptance (12 months from date of manufacture)
g. The statement (as appropriate)
Part A - Contains Pigment & Epoxy Resin
Part B - Contains Catalyst
h. Quantity
i. Mixing proportions, Application Temperature and Instructions
j. Safety Information
k. Manufacturer's Name and Address

Reflective glass spheres shall be shipped in moisture resistant bags. Each bag shall be marked with the name and address of the manufacturer and the name and net weight of the material.

F. The Department reserves the right to randomly take a one-quart sample of white, yellow and hardener, of the epoxy material or glass spheres without prior notice for testing to ensure the epoxy material meets specifications.

Epoxy Application Equipment:

Application equipment for the placement of epoxy reflectorized pavement markings shall be approved by the Department, prior to the start of work.

At any time throughout the duration of the project, the Contractor shall provide free access to his epoxy application equipment for inspection by the Engineer or his authorized representative.

In general, the application equipment shall be a mobile, truck mounted and self contained pavement marking machine, specifically designed to apply epoxy resin materials and reflective glass spheres in continuous and skip-line patterns. The application equipment shall be maneuverable to the extent that straight lines can be followed and normal curves can be made in a true arc. In addition, the truck mounted unit shall be provided with accessories to allow for the marking of legends, symbols, crosswalks, and other special patterns.

The Engineer may approve the use of a portable applicator in lieu of truck mounted accessories, for use in applying special markings only, provided such equipment can demonstrate satisfactory application of reflectorized epoxy markings in accordance with these specifications.

The applicator shall be capable of installing up to 20,000 lineal feet (6,100 lineal meters) of epoxy reflectorized pavement markings in an 8-hour day and shall include the following features:

1. The applicator shall provide individual material reservoirs, or space, for the storage of Part A and Part B of the epoxy resin composition; for the storage of water; and for the storage of reflective glass spheres.

2. The applicator shall be equipped with heating equipment of sufficient capacity to maintain the individual epoxy resin components at the manufacturer's recommended temperature for spray application and for heating water to a temperature of approximately 140°F (60°C).

3. The glass spheres shall be gravity dropped upon 20 mils (500 um) of epoxy pavement markings to produce a wet-night-reflective pavement marking. The large spheres (Federal Spec. Type 4) shall be applied at a rate of 12 pounds per gallon (1.4 kg/L) of epoxy pavement marking material, immediately followed by a second drop of AASHTO M-247 Type 1 glass spheres applied rate of 12 pounds per gallon (1.4 kg/L) of epoxy pavement marking material. This application rate and the following gradation shall conform to FHWA's FP-96: Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (pages 757-761 Type 3 and Type 4 Beads).

4. The applicator shall be equipped with metering devices or pressure gauges, on the proportioning pumps. Metering devices or pressure gauges shall be visible to the Engineer.

5. The applicator shall be equipped with all the necessary spray equipment, mixers, compressors, and other appurtenances to allow for the placement of epoxy reflectorized pavement markings in a simultaneous sequence of operations as described below in Construction Details, D. Applications of Epoxy Reflectorized Pavement Markings of this Special Provisions.

Construction Details.

A. General: All pavement marking and patterns shall be placed as shown on the Plans or as directed by the Engineer.

Before any pavement markings work is begun, a schedule of operations shall be submitted for the approval of the Engineer. This schedule shall be submitted 2 weeks prior to the application of the striping.

At least five (5) days prior to starting striping the Contractor shall provide the Engineer with the epoxy manufacturer's written instructions for use. These instructions shall include but not be limited to: mixing ratios, application temperatures, and recommendations for use of water spray.

The application of pavement markings shall be done in the general direction of traffic. Striping against the direction of traffic flow shall not be allowed.

The Contractor shall be responsible for removing, to the satisfaction of the Engineer, tracking marks, spilled epoxy or epoxy markings applied in unauthorized areas.

The hot water spray shall not be used in conjunction with markings applications on any pavement surface, or on any existing durable type marking, unless specifically recommended by the manufacturer of the epoxy material.

B. Atmospheric Conditions: Epoxy pavement markings shall only be applied during conditions of dry weather and on substantially dry pavement surfaces. At the time of installation the pavement surface temperature shall be a minimum of 35°F (2°C) and the ambient temperature shall be a minimum of 35°F (2°C) and rising. The Engineer shall be the sole determiner as to when atmospheric conditions and pavement surface conditions are such to produce satisfactory results.

C. Surface Preparations: The Contractor shall clean the pavement or existing durable marking to the satisfaction of the Engineer.

Surface cleaning and preparation work shall be performed only in the area of the epoxy markings application.

At the time of application all pavement surfaces and existing durable markings shall be free of oil, dirt, dust, grease and similar foreign materials. The cost of cleaning these contaminants shall be included in the bid price of this item. Also, the item shall include the cost of removal of the curing component in the area of the epoxy markings application, if concrete curing compounds on new portland cement concrete surfaces have been used. Waterblasting will not be permitted for removal.

D. Application of White/Yellow Epoxy Reflectorized Pavement Markings: White/yellow epoxy reflectorized pavement markings shall be placed at the widths and patterns designated on the Contract Plans.

Markings operations shall not begin until applicable surface preparation work is completed, and approved by the Engineer.

White/yellow epoxy pavement markings shall be applied at a minimum uniform thickness of 20 mils (500 μm) on all Portland cement concrete and bituminous concrete pavement, including Stone Matrix Asphalt.

Large reflective glass spheres (Federal Spec. Type 4) shall be applied at the rate of 12 pounds per gallon (1.4 kg/L) of epoxy pavement marking material, immediately followed by a second drop of AASHTO M-247 Type 1 glass spheres applied at a rate of 12 pounds per gallon (1.4 kg/L) of epoxy pavement marking material. Glass spheres shall uniformly cover the length and width of the pavement marking.

E. Application of Black Epoxy Contrast Pavement Markings: Black epoxy contrast pavement markings shall be placed at the widths designated on the Contract Plans.

Markings operations shall not begin until applicable surface preparation work is completed, and approved by the Engineer.

Black epoxy contrast pavement markings shall be applied at a minimum uniform thickness of 20 mils (500 μm) on all Portland cement concrete surfaces followed by a single drop of graded black aggregate.

The width of black epoxy line shall be applied for the following situations:

Center Skip Line - On Portland cement concrete pavements a black contrast skip line shall be 10 feet (3 m) in length of the same width as the white epoxy reflectorized skip. It is to lead the white skip and stop at the beginning of the white skip. The black contrast skip is to have a single application of graded black aggregate.

Edge Lines -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 μm) as applicable] and line widths; insufficient glass bead coverage or inadequate glass bead retention.

   Repair Method: Prepare the surface of the defective epoxy marking by shot blasting, sand blasting, or water blasting. No other cleaning methods will be allowed. Surface preparation shall be performed to the extent that a substantial amount of the reflective glass spheres are removed and a roughened epoxy marking surface remains.

   Immediately after surface preparation remove loose particles and foreign debris by brooming or blasting with compressed air.

   Repair shall be made by re-striping over the cleaned surface, in accordance with the requirements of this specification and at a full 20±1 mils (500 μm) minimum line thickness as applicable.

2. Uncured or discolored epoxy (brown patches); insufficient bond to pavement surface (or existing durable marking).

   Uncured epoxy shall be defined as applied material that fails to cure (dry) in accordance with the requirements of this specification under MATERIALS, A, 2d. DRYING TIME (FIELD);

or applied material that fails to cure (dry) within a reasonable time period under actual field conditions, as defined by the Engineer.

Discoloration (brown patches) shall be defined as localized areas or patches of brown or grayish colored epoxy marking material. These areas often occur in a cyclic pattern and also, often are not visible until several days or weeks after markings are applied.

Repair Method: The defective epoxy marking shall be completely removed and cleaned to the underlying pavement surface to the satisfaction of the Engineer.

The extent of removal shall be the defective area plus any adjacent epoxy pavement marking material extending one foot (300 mm) any direction.

After surface preparation work is complete, repair shall be made by re-applying epoxy over the cleaned pavement surface in accordance with the requirements of this specification.

3. Reflectivity for epoxy resin paint.

After satisfactory completion of all striping work and written notification from the Contractor, the Department shall test the striping to ensure it has the minimum reflectivity. The testing will be completed within 30 calendar days from notification. The Contractor may request that tests be conducted on completed phases or portions of the work. Approval of such a request will be at the discretion of the Engineer. Testing will be done using a LTL-X Retrometer (30 meter geometry). Five readings will be taken per line per mile (1.6 km). Projects less than 1 mile (1.6 km) in length will have a minimum of 5 readings per line. These readings will then be averaged for the overall project average.

The required average minimum initial reflectivity reading in millicandellas shall be:

White 450
Yellow 325

Any single reading shall not be less than 350 millicandellas for white and 250 millicandellas for yellow. Without exception, any pavement markings installed that does not meet the above average minimum initial reflectivity numbers shall be removed and replaced, at the installation contractor's expense.

Other defects not noted above, but determined by the Engineer to need repair, shall be repaired or replaced as directed by and to the satisfaction of the Engineer.

All work in conjunction with the repair or replacement of defective epoxy reflectorized pavement markings shall be performed by the Contractor at no additional cost to the State.

Method of Measurement:

The quantity of permanent pavement striping (white, yellow, or black epoxy resin paint) will be measured by the number of linear feet (meters) of pavement striping line and number of square feet (meter) of symbol installed on the pavement and accepted in accordance with the Plans.

Basis of Payment:

The quantity of permanent pavement striping (white, yellow, or black epoxy resin paint) payment will be paid for at the Contract unit price per linear foot (meter) for 3", 4", 5", 6", 8", 9", 10", 12", 14", 16" (75 mm, 100 mm, 125 mm, 150 mm, 200 mm, 225 mm, 250 mm, 300 mm, 350 mm, or 400 mm) line and the Contract unit price per square foot (meter) of symbol. The quantity of permanent pavement marking (white, yellow, or black epoxy resin paint) will be paid for at the Contract unit price per linear foot (meter) of line and the Contract unit price per square foot (meter) of symbol. Price and payment shall include striping layout, cleaning and preparing the pavement surface, and placing all materials, for all labor, tools, equipment and incidentals necessary to complete the work.

NOTE:

For information only:

The following manufacturers are known to us which manufacturer Epoxy Resin Paint for Pavement Striping. The Department does not endorse or require the use of any of the manufacturers listed below. However, a bidder wishes to use another manufacturer's product, it shall be submitted for review and approval prior to submitting a bid proposal. Should the product be deemed unacceptable by the Department, the successful bidder will be required to use only an approved product.

1. POLY CARB, Inc.
   33095 Bainbridge Road
   Solon, Ohio 44139
   Tel. 1-800-CALLMIX

2. IPS - Ennis Paint
   P.O. Box 13582
   Research Triangle Park, North Carolina 27709
   Tel. 1-877-477-7623

3. Epoplex
   One Park Avenue
   Maple Shade, NJ 08052
   Tel. 1-800-822-6920

4. Or an approved equal.

8/7/2013

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

1) **Description:**

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

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

The Engineer will only establish the following:

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

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

3) 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:

4) Performance Requirements:

(a) Construction Engineering shall include establishing the survey points and survey centerlines; finding, referencing, offsetting the project control points; running a horizontal and vertical circuit to verify the precision of given control points. Establishing plan coordinates and elevation marks for culverts, slopes, subbase, subsurface drains, paving, subgrade, retaining walls, and any other stakes required for control lines and grades; and setting vertical control elevations, such as footings, caps, bridge seats and deck screed. The Contractor shall be responsible for the preservation of the Department's project control points and benchmarks. The Contractor shall establish and preserve any temporary control points (traverse points or benchmarks) needed for construction. Any project control points (traverse points) or benchmarks conflicting with construction of the project shall be relocated by the Contractor. The Contractor as directed by the Engineer must replace any or all stakes that are destroyed at any time during the life of the contract. The Contractor shall re-establish centerline points and stationing prior to final cross-sections by the Engineer. The Vertical Control error of closure shall not exceed 0.035 ft times [Square root of number of miles in the level run] (0.01 m times [square root of number of kilometers]). The Horizontal Control precision ratio shall have a minimum precision of 1:20,000 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 must immediately bring to the attention of the Engineer any potential drainage problem within the project limits. The Engineer must approve any proposed variation in profile, width or cross slope.

(d) The Contractor shall establish the working points, centerlines of bearings on bridge abutments and on piers, mark the location of anchor bolts to be installed, check the elevation of bearing surfaces before and after they are ground and set anchor bolts at their exact elevation and alignment as per Contract Plans. Before completion of the fabrication of beams for bridge superstructures, the Contractor shall verify by accurate field measurements the locations both vertically and horizontally of all bearings and shall assume full responsibility for fabricated beams fitting and bearing as constructed. After beam erection and concurrently with the Department project surveyors or their designated representative, the Contractor shall survey top of beam elevations at a maximum of 10-ft (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 utility relocations, which will be performed by others, after the Notice to Proceed has been given to the Contractor, shall be paid for under item 763597 - Utility Construction Engineering.

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

(g) 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.

(h) Whenever the Engineer will be recording data for establishment of pay limits, the Contractor will be invited to obtain the data jointly with the Engineer's Survey Crew(s) in order to agree with the information. If the Contractor's representative is not able to obtain the same data, then the information obtained by the Engineer shall be considered the information to be used in computing the quantities in question.

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

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

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

(k) Baseline for each borrows pit location.
(l) Detailed sketch of proposed overhead ground mounted signs or signals showing obstructions that may interfere with their installation.
(m) Copies of cut sheets.

Machine Control Grading

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

Description:

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

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

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

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

Materials:

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

Construction:

a. DelDOT Responsibilities:

1. The Department will set initial vertical and horizontal control points in the field for the project as indicated in the contract documents, (plans set). If the Contractor needs to establish new control points they shall be traversed from existing control points and verified to be accurate by conventional surveying techniques.

2. The Department will provide the project specific localized coordinate system.

3. The Department will provide data in an electronic format to the Contractor as indicated in the General Notes.

    a. The information provided shall not be considered a representation of actual conditions to be encountered during construction. Furnishing this information does not relieve the Contractor from the responsibility of making an investigation of conditions to be encountered including, but not limited to site visits, and basing the bid on information obtained from these investigations, and the professional interpretations and judgments of the Contractor. The Contractor shall assume the risk of error if the information is used for any purpose for which the information is not intended.

b. Any assumption the Contractor makes from this electronic information shall be at their risk. If the Contractor chooses to develop their own digital terrain model the Contractor shall be fully responsible for all cost, liability, accuracy and delays.

c. The Department will develop and provide electronic data to the Contractor for their use as part of the contract documents in a format as indicated in the General Notes. The Contractor shall independently ensure that the electronic data will function in their machine control grading system.

4. The Files that are provided were originally created with the computer software applications MicroStation (CADD software) and INROADS (civil engineering software). The data files will be provided in the native formats and other software formats described below. The contractor shall perform necessary conversion of the files for their selected grade control equipment. The Department will furnish the Contractor with the following electronic files:

a. CAD files
   i. Inroads -Existing digital terrain model (.DTM)
   ii. Inroads -Proposed digital terrain model (.DTM)
   iii. Microstation -Proposed surface elements - triangles

b. Alignment Data Files:
   i. ASCII Format

5. The Engineer shall perform spot checks of the Contractor's machine control grading results, surveying calculations, records, field procedures, and actual staking. If the Engineer determines that the work is not being performed in a manner that will assure accurate results, the Engineer may order the Contractor to redo such work to the requirements of the contract documents, and in addition, may require the Contractor to use conventional surveying and staking, both at no additional cost to the Department.

B. Contractor's Responsibilities

1. The Contractor shall provide the Engineer with a GPS rover and Automatic Level, for use during the duration of the contract. At the end of the contract, the GPS rover and Automatic Level will be returned to the Contractor. The Contractor shall provide a total of 8 hours of formal training on the Contractor's GPS machine control system to the Engineer and up to three additional Department appointees per rover.

2. The Contractor shall review and apply the data provided by the Department to perform GPS machine control grading.

3. The Contractor shall bear all costs, including but not limited to the cost of actual reconstruction of work, that may be incurred due to application of GPS machine control grading techniques. Grade elevation errors and associated corrections including quantity adjustments resulting from the contractor's use of GPS machine control shall be at no cost to the Department.

4. The Contractor shall convert the electronic data provided by the Department into a format compatible with their system.

5. The Contractor's manipulation of the electronic data provided by the Department shall be performed at their own risk.

6. The Contractor shall check and if necessary, recalibrate their GPS machine control system at the beginning of each workday in accordance with the manufacturer's recommendations, or more frequently as needed to meet the requirements of the project.

7. The Contractor shall meet the accuracy requirements as detailed in the Standard Specifications.

8. The Contractor shall establish secondary control points at appropriate intervals and at locations along the length of the project. These points shall be outside the project limits and/or where work is performed. These points shall be at intervals not to exceed 1000 feet. The horizontal position of these

points shall be determined by conventional survey traverse and adjustments from the original baseline control points. The conventional traverse shall meet or exceed the Department's Standards. The elevation of these control points shall be established using differential leveling from the project benchmarks, forming a closed loop. A copy of all new control point information including closure report shall be provided and approved by the Engineer prior to construction activities. The Contractor shall be responsible for all errors resulting from their efforts and shall correct deficiencies to the satisfaction of the Engineer and at no additional cost to the Department.

9. The Contractor shall provide stakes at all alignment control points, at every 500 foot stationing, and where required for coordination activities involving environmental agencies and utility companies at the Contractor's expense. Work that is done solely for utility companies and that is beyond the work performed under item 763501 - Construction shall follow and be paid for under item 763597 -Utility Construction Engineering.

10. The Contractor shall at a minimum set hubs at the top of finished grade at all hinge points on the cross section at 500 foot intervals on the main line and at least 4 cross sections on side roads and ramps as directed by the engineer or as shown on the plans. Placement of a minimum of 4 control points outside the limits of disturbance for the excavation of borrow pits, Stormwater Management Ponds, wetland mitigation sites etc. These control points shall be established using conventional survey methods for use by the Engineer to check the accuracy of the construction.

11. The Contractor shall preserve all reference points and monuments that are identified and established by the Engineer for the project. If the Contractor fails to preserve these items the Contractor shall reestablish them at no additional cost to the Department.

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

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

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

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

Contract Control Plan:

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

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

2. Include a summary of the calculated closures of the existing control network, and which control has been determined to have been disturbed or out of tolerance from its original positioning.

3. An explanation of which horizontal and vertical control points will be held for construction purposes. If necessary include all adjustments which may have been made to achieve required closures.

4. An explanation of what horizontal and vertical control (including base stations) was set to accomplish the required stakeout or automated machine operation. Include how the position of these new control points was determined.

5. Describe the proposed method and technique (technology and quality control) for utilizing the control to establish the existing and/or proposed feature location and to verify the completed feature location and/or measured quantity.

6. A listing of the horizontal and vertical datums to be used and the combined factor to be used to account for ellipsoidal reduction factor and grid scale factor.

7. If the Contractor chooses to use machine control as a method of measuring and controlling excavation, fill, material placement or grading operations as a method of measuring and controlling excavation, fill, material placement or grading operations, the Contractor Control Plan shall include the method by which the automated machine guidance system will initially be site calibrated to both the horizontal and vertical contract control, and shall describe the method and frequency of the calibration to ensure consistent positional results.

8. Issues with equipment including inconsistent satellite reception of signals to operate the GPS machine control system will not result in adjustment to the "Basis of Payment" for any construction items or be justification for granting contract time extension.

Method of Measurement:

The quantity of Construction Engineering will not be measured.

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.

3/27/15

763522 - COAST GUARD SPECIFIC CONDITIONS

Description:

The Contractor shall prosecute his work in accordance with the specific requirements imposed by this Special Provision.

Under this item the contractor will be required to:

1. Prepare and furnish three copies of a plan and schedule for his operations within the waterway, for submission to Commander (AOWB), 5th Coast Guard District, 431 Crawford St., Portsmouth, VA 23704 for approval. The Contractor shall comply with all provisions of the Inland Rules of the Road. The Contractor shall give written notice to the Coast Guard of any planned temporary obstruction to the waterway navigation as well as copies of the plan and schedule of operations at least 30 days in advance of commencement of the work.

The plan and schedule of operations within the waterway shall include:

(a) A sketch of the waterway indicating:

   (1) Locations of all restrictions that will be placed in the waterway, such as barges, anchors and anchor lines.

   (2) The location and height above high mean water of any scaffolding or netting.

(b) A projected set of dates and length of time each operation will take, hours of each operation and whether or not the equipment will be removed at night.

2. Give immediate notice to the Coast Guard and to the Department, of any material, machinery or equipment lost, dumped, thrown overboard, sunk or misplaced during the progress of the work. The Contractor must remove the object with utmost dispatch. Until removal can be affected, the object or objects shall be properly marked in order to protect navigation. Notices to the Coast Guard and to the Department shall give a description and location of any such object and the action taken or being taken to protect navigation.

3. Furnish and install temporary obstruction lights as may be required by his operation and his permanent construction under this contract. Each temporary light shall consist of battery or power operated slow flashing amber light less than 60 flashes per minutes and visible for a range of 4 nautical miles on 90% of the nights of the year. Generally a lamp of 20 candle power will meet these requirements. If necessary to obtain the coverage required, a light or lights on the upstream and downstream sides shall be installed. Bridge piers shall be so marked until the construction has been completed and permanent navigational lights have been installed and determined to be operating satisfactorily. Four copies of Plans showing the proposed temporary lights during construction shall be submitted to the Department for approval before work is commenced. Deviations from the prescribed temporary lights during periods of construction will be permitted only upon written Coast Guard approval.

In the event the Contractor fails to comply with these foregoing requirements and the Federal Government is required to take action in this matter for the protection of navigation, the Department reserves the right to recover costs for such work from the Contractor.

The Federal Government and the Department assume no responsibility for any damage sustained or caused by the Contractor's plant, equipment or barges being anchored or moored at the aforementioned location and approval by either agency shall not act as a waiver of liability for any damage that may result from the Contractor's operation.

The Contractor shall maintain the temporary obstruction lights on permanent construction until permanent navigational lights have been installed and made operable in accordance with the Coast Guard requirements.

Basis of Payment:

All work and the Contractor's costs in every respect for compliance with the specific conditions imposed by the Coast Guard Commandant and specific under this item, together with the maintenance and removal of the temporary obstruction lights, installing of permanent navigational lights, and all else in connection therewith and incidental thereto which is not provided for under any stipulated pay item "Coast Guard Specific Conditions", which price and payment shall constitute full compensation for furnishing and installing all materials as described herein.

11/2/06

763623 - NETTING, MIGRATORY BIRD EXCLUSION

Description:

This item shall consist of the installation, maintenance, and removal of a barrier that will prevent the nesting of migratory birds. The barrier shall be installed to completely encapsulate the sides and understructure of the bridges up to the concrete road without holes or sagging, prohibiting access to the girders upon which migratory birds typically nest.

Materials:

Netting: The netting shall consist of a durable polypropylene mesh of any color. The mesh size shall be no larger than 3/4" by 3/4" square. Items commonly sold as "bird/aquatic cage or trap netting" typically meet these specifications. Netting type and mesh size shall be approved by the Engineer prior to installation.

Netting attachment materials: Materials used to attach netting shall be appropriate for the type of netting used and as approved by the Engineer. Solvent based sealer/adhesive shall not be used on any of the netting, because it can melt the netting on contact. Materials to support and repair the netting shall also be appropriate for the type of netting used and as approved by the Engineer.

Construction Methods:

General: The migratory bird exclusion barrier shall consist of netting that is taut against the underside and sides of the bridge, with no holes or openings. To prevent damage to the netting, the netting shall not drape into the tidal waters of the Christina River. After installation, there shall be no area under or on the sides of the bridge accessible to migratory birds and available for migratory bird nesting.

Netting and Netting Attachments: Netting shall be installed using methods that are appropriate for the netting. The use of overhead supports, support cables, netting frames, or any other method as approved by the engineer may be used to attach the netting. When measuring the netting, a minimum of 6 extra inches shall be added to each side to allow for overlap. The netting shall be attached such that it shall run no more than 50 feet in any direction without support, 25 feet is preferred. Stable pipes, beams, and trusses shall be used to support netting where safe and appropriate. Support cables shall be used when there is minimal overhead support. Other methods shall be used as approved by the Engineer.

Construction planning: The migratory bird nesting season begins on April 15 and ends on August 1. During any year construction may occur, all components of the migratory bird exclusion netting, shall be installed prior to April 15 the start of the nesting season. The netting and netting materials shall remain in place and in good working order until the end of the nesting season, or until there is continuous construction on the bridge as per the Engineer. Bridge deck work and barrier removed shall be considered continuous work. The netting shall be removed and properly disposed of after August 1 or once continuous construction begins as stated above.

Maintenance: The Contractor shall inspect the netting on a weekly basis. The Contractor shall maintain the migratory bird exclusion netting in good working order with out holes or loose areas, making repairs as necessary or as directed by the Engineer. The Contractor shall repair the netting using appropriate repair materials as specified in this item.

Method of Measurement:

The quantity of netting and netting attachment hardware will not be measured. The unit will include all necessary materials, fittings, accessories required per this specification, installation, inspection, maintenance and disposal of material fitting, accessories required per this specification.

Basis of Payment:

The migratory bird netting will be paid for at the Contract lump sum. Price and payment will constitute full compensation for furnishing and installing all materials; maintenance and repair of the netting; and the removal and subsequent disposal of all materials.

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.

11/17/10

763643 - MAINTENANCE OF TRAFFIC – ALL INCLUSIVE

Description:

This item shall consist of furnishing, installing, maintaining and/or relocating the necessary temporary traffic control devices used to maintain vehicular, bicycle and pedestrian traffic, including persons with disabilities in accordance with the Americans with Disabilities Act, as amended. All work shall be performed in a manner that will provide reasonably safe passage with the least practicable obstruction to all users, including vehicular, bicycle and pedestrian traffic.

All requirements of the Delaware Manual on Uniform Traffic Control Devices (MUTCD), Part 6, herein referred to as the Delaware MUTCD. (latest edition with all revisions made up to the date of Advertisement of this project) shall apply for all temporary traffic control devices. Any, and all, control, direction, management and maintenance of traffic shall be performed in accordance with the requirements of the Delaware MUTCD, notes on the Plans, this specification, and as directed by the Engineer.

The Contractor shall be aware that the Case Diagrams and safety measures outlined in the Delaware MUTCD are for common construction situations and modifications may be warranted based on the complexity of the job. The Contractor shall submit justification for modifications to the Temporary Traffic Control Plan (TTCP) to the Engineer for approval prior to implementation.

The Department reserves the right to impose additional restrictions, as needed, for the operational movement and safety of the traveling public. The Department reserves the right to suspend the Contractor's operations until compliance with the Engineer's directive for remedial action, based on but not limited to the following reasons:

1. The Contractor's operations are not in compliance with the Delaware MUTCD, the specifications or the Plans.

2. The Contractor's operations have been deemed unsafe by the Traffic Safety Engineer or District Safety Officer.

Materials and Construction Methods:

The Contractor shall submit a Temporary Traffic Control Plan (TTCP) or a Letter of Intent to use the Plan recommended Delaware MUTCD Case Diagram(s) at or prior to the pre-construction meeting. The Contractor shall submit the TTCP for all Contractor and subcontractor work to be performed on the project for the Department's approval before the start of work.

When specified by a note in the Plans, the Contractor shall be required to have an American Traffic Safety Services Association (ATSSA) certified Traffic Control Supervisor on the project. The authorized designee must be assigned adequate authority, by the Contractor, to ensure compliance with the requirements of the Delaware MUTCD and provide remedial action when deemed necessary by the Traffic Safety Engineer or the District Safety Officer. The ATSSA certified Traffic Control Supervisor's sole responsibility shall be the maintenance of traffic throughout the project. This responsibility shall include, but is not limited to, the installation, operations, maintenance and service of temporary traffic control devices. Also required is the daily maintenance of a log to record maintenance of traffic activities, i.e., number and location of temporary traffic control devices; and times of installation, changes and repairs to temporary traffic control devices. The ATTSA Traffic Control Supervisor shall serve as the liaison with the Engineer concerning the Contractor's maintenance of traffic. The name, contact number and certification for the designated Traffic Control Supervisor shall be submitted at or prior to the pre-construction meeting. The cost of the ATSSA certified Traffic Control Supervisor shall be incidental to this item.

Temporary traffic control devices shall be maintained in good condition in accordance with the brochure entitled "Quality Guidelines for Temporary Traffic Control Devices", published by the American Traffic Safety Services Association (ATSSA). Any temporary traffic control devices that do not meet the quality guidelines shall be removed and replaced with acceptable devices. Failure to comply will result in work stoppage with time charges continuing to be assessed.

Any existing signs that conflict with any temporary or permanent construction signs shall be covered as needed or as directed by the Engineer. The cost for temporarily covering conflicting signs shall be incidental to this item.

Access to all transit stops located within the project limits shall be maintained unless otherwise directed by the Plans or the Engineer. Maintaining access shall include maintaining an area for the transit vehicle and also an accessible path for pedestrians to safely access the transit stop.

The Contractor shall notify the Engineer, in writing, no less than fourteen (14) calendar days prior to the start of any detour(s) and road closures. The Engineer will notify the following entities:

- Local 911 Center
- Local School Districts
- Local Post Offices
- DelDOT's Transportation Management Center (TMC)
- Town Managers
- Local Police
- DelDOT's Public Relations
- Delaware Transit Corporation (DTC)

Immediately prior to the implementation of any lane or road closures, the Engineer shall notify the DelDOT TMC at (302) 659-4600. Notifications shall also be provided when the closures are lifted. The Engineer shall notify TMC and the District Safety Officer if any lane closures cannot be removed prior to the end of the allowable work hours.

The Contractor shall notify the local 911 center if access to a fire hydrant is temporarily restricted. The Contractor shall provide written confirmation to the Engineer that the local 911 center has been notified.

If a detour is required during any part or the entire period of this Contract, an approved detour plan shall be obtained from the Department's Traffic Safety Section. All signs, barricades and other temporary traffic control devices required as part of the approved detour plan shall be installed and maintained by the Contractor on the route that is closed and on the detour route. Road closures without an approved detour plan shall not be allowed. If a road is closed without an approved detour plan, the Contractor's operations shall be stopped immediately.

The Contractor shall provide and maintain ingress and egress for each property abutting the construction area and each property located between the diversion points of any detour and the actual construction site. Construction activities which may temporarily or otherwise interfere with property access shall be coordinated in advance with the affected property owners.

The Contractor shall conduct construction operations in a manner which will minimize delays to traffic, and shall meet the following requirements:

1. If work is being performed within 200 feet in any direction of an intersection that is controlled by a traffic signal, the flagger(s) shall direct the flow of traffic in concert with the traffic signals in construction areas to avoid queuing, unless active work prohibits such action. The flagger shall direct traffic to prevent traffic from queuing through an intersection (i.e., blocking an intersection). Only a Traffic Officer may direct traffic against the operation of a traffic signal and only until the operation occurring within the intersection is completed.

2. When a lane adjacent to an open lane is closed to travel, the temporary traffic control devices shall be set 2 feet (0.61 m) into the closed lane from the edge of the open lane, unless an uncured patch exists or actual work is being performed closer to the open lane with minimum restriction to traffic.

3. Except for "buffer lanes" on high volume and/or high speed roadways, lanes shall not be closed unless construction activity requiring lane closure is taking place, or will take place within the next hour. Lanes shall be reopened immediately upon completion of the work. Moving operations will require the lane closures be shortened as the work progresses and as traffic conditions warrant to minimize the length of the closure. The Contractor shall conduct construction operations in a manner so as to minimize disruption to traffic during

peak hours and periods of heavy flow. The Department reserves the right to stop or change the Contractor's operations, if in the opinion of the Engineer, such operations are unnecessary at that time or the operations are unnecessarily impeding traffic.

4. Work in the vicinity of traffic signals, shall be scheduled to minimize the time during which the signal is operated without detectors, and prior approval from the Engineer shall be required. TMC shall be notified in advance of cutting a loop detector, and be immediately notified once the loop detector has been reinstalled. The Contractor shall provide sufficient advance notice of the loop detector work with the Engineer to ensure the aforementioned requirements are met.

It is required that all temporary traffic control work and related items shall either be performed entirely by the Contractor's own organization, or totally subcontracted. Maintenance of equipment shall not be subject to this requirement.

Any deficiencies related to temporary traffic control that are reported to the Contractor in writing shall be corrected within 24 hours or as directed by the Engineer. Failure to comply will result in non-payment for those devices that are found to be deficient for the duration of the deficiency. Serious deficiencies that are not corrected immediately shall result in suspension of work until items identified are brought back into compliance.

At the end of each day's work, the Contractor shall correct all pavement edge drop-offs in accordance with Table 6G-1 in the Delaware MUTCD. This corrective work shall be accomplished with Temporary Roadway Material (TRM) unless an alternate method is specified in the Plans. All ruts and potholes shall be filled with TRM as soon as possible but no later than the end of each work day. Placement and Payment of TRM shall be completed in accordance with Section 402 of the Standard Specifications. If temporary elimination of a drop-off hazard cannot be accomplished, then the area should be properly marked and protected with temporary traffic control devices such as temporary barricades, warning signs, flashing lights, etc. as required by Section 6G.21 of the Delaware MUTCD.

All open trench excavation accessible by vehicular traffic must be backfilled prior to the end of each working day. Steel plates shall not be used except in emergency situations and only with prior written approval from the Engineer unless otherwise directed by the Plans.

The Contractor shall submit, at or prior to the preconstruction meeting, detailed drawings including but not limited to existing striping lengths, lane and shoulder widths, turn lane lengths, locations of stop bars, turn arrows, crosswalks and railroad crossings. The drawings shall depict the existing pavement markings for each project location. These drawings will be reviewed by the Department's Traffic Section to determine the need for modification(s) for compliance with the Delaware MUTCD. Temporary pavement markings, on the final pavement surface, shall match the Plan dimensions and layout or the approved drawings of the permanent markings in compliance with Section 3 of the Delaware MUTCD. All conflicting or errant striping shall be removed as directed by the Engineer in compliance with the specifications for Item 748530 (Removal of Pavement Striping).

At the end of each day's operation and before traffic is returned to unrestricted roadway use, temporary striping shall be utilized when the existing pavement is milled and hot mix will not be placed the same day or more than a single course of hot mix is to be placed or permanent roadway striping cannot be placed on the same day as the placement of the final course of hot mix. Placement of temporary striping shall receive prior approval from the Engineer and the contractor shall apply temporary pavement markings in accordance with the requirements of Section 748 of Delaware Standard specifications and the Delaware MUTCD. Payment for temporary pavement striping shall be made at the unit price bid for item 748 - Temporary Striping. Payment for final striping will be included in the applicable striping item.

The Contractor shall have temporary striping/delineating materials (such as raised markers, tape, and other approved materials) available at the job site for verification by the Department prior to starting the hot-mix paving operation on roads to be immediately opened to traffic. These materials shall be used by the Contractor for temporary markings if he/she fails to apply temporary marking paint, etc., as required by the Delaware MUTCD. No paving operations on roads to be immediately opened to traffic will be allowed unless such verification has been made for the availability of the materials at the job site.

Travel lane and ramp closings on multilane highways and Interstates shall not be permitted during the following holiday periods:

- December 24 through December 27 (Christmas Day)
- December 31 through January 3 (New Years Day)
- Friday prior to Easter through Easter Sunday
- Thursday prior to Memorial Day through the Tuesday following Memorial Day
- Dover International Speedway Race Weekends (Thursday prior to the race event through the day after the race event)
- July 3 through July 5 (Independence Day)
- Thursday prior to Labor Day through the Tuesday following Labor Day
- Wednesday prior to Thanksgiving Day through the Monday following Thanksgiving Day

Additional time restrictions may apply as noted in the project plans or as directed by the Engineer. Any requests to waive any restrictions must be made in writing to the Engineer for review and approval. A copy of the request shall be provided to the District Safety Officer for review.

Certification:

Temporary traffic control devices used on all highways open to the public in this State shall conform to the Delaware MUTCD. All devices shall be crashworthy in accordance with the National Cooperative Highway Research Program (NCHRP) Report 350, the memorandum issued August 28, 1998 by The USDOT Federal Highway Administration, and/or in accordance with the latest edition of the Manual for Assessing Safety Hardware (MASH), published by the American Association of State Highway and Transportation Officials (AASHTO).

The Contractor shall submit certification for temporary traffic control devices or vendors used specifically on this project at or prior to the pre-construction meeting.

Certification of compliance with NCHRP report 350 and/or MASH is required for the following categories of temporary traffic control devices:

Category I contains small and lightweight channelizing and delineating control devices which includes cones, tubular markers, flexible delineator post and drums, all without any accessories or attachments.

Category II includes temporary traffic control devices that are not expected to produce significant vehicular velocity changes to impacting vehicles. These devices which shall weigh 45 kg or less, include Type I, II and III barricades, portable sign supports with signs, and intrusion alarms. Also included are drums, cones, and vertical panels with accessories or attachments.

Category III includes temporary traffic control devices that are expected to cause significant vehicular velocity changes to impacting vehicles. These devices which weigh more than 45 kg include temporary barrier, temporary impact attenuators, and truck-mounted attenuators.

Category IV includes portable or trailer-mounted devices such as arrow panels, variable message signs, temporary traffic signals and temporary area lighting.

For Category I devices, the manufacturer or Contractor may self-certify that the devices meet the NCHRP-350 and/or MASH criteria. The Contractor shall supply the Federal Highway Administration's NCHRP-350 and/or MASH acceptance letter for each type of device that falls under Category II and III devices.

Basis of Payment:

Payment will be made at the Lump Sum price for "Maintenance of Traffic", for which price and payment constitutes full compensation for all maintenance of traffic activities accepted by the Engineer, which shall include the cost of furnishing and relocating permanent and temporary traffic control signs, traffic cones or drums, submission of temporary traffic control plan(s), submission of existing pavement marking drawings, submission of all required certifications, labor, equipment and incidentals necessary to complete the item. Payment to furnish and maintain other temporary traffic control devices including but not limited

to Portable P.C.C. Safety Barrier, Truck Mounted Attenuators, Portable Changeable Message Signs, Arrow Panels and Portable Light Assemblies will be made at the contract unit price for each item.

NOTE

If the Contractor does not complete the Contract work within the Contract completion time (including approved extension time), the Contractor shall be responsible for providing the necessary temporary traffic control devices that are required to complete any remaining work. The costs of such temporary traffic control shall be borne by the Contractor. No additional payment will be made to the Contractor to maintain traffic in accordance with the Delaware MUTCD, contract plans and specifications. Temporary traffic control items include, but not be limited to, warning lights, warning signs, barricades, plastic drums, P.C.C. safety barrier, flaggers, traffic officers, arrow panels, message boards, and portable impact attenuators.

6/21/2011

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

JENNIFER COHAN
SECRETARY

UTILITY STATEMENT
October 28, 2015
Revised: August 21, 2017
STATE CONTRACT No. T201407601
F.A.P. #EBHOS-S013 (02)
Project I.D. No. 14-03132
BR 3-152 ON CENTRAL AVENUE AND
BR 3-161 ON POPLAR STREET OVER BROAD CREEK
SUSSEX COUNTY

The utility companies listed below own and/or maintain facilities within the project limits.

DELMARVA POWER
VERIZON DELAWARE LLC
WINDSTREAM (CAVALIER)

Utility adjustments and relocations for the companies shall occur as described, but are not limited to the following:

BRIDGE 3-152 on US 13-Central Avenue over Broad Creek

DELMARVA POWER & LIGHT, ELECTRIC (DP&L)

DP&L maintains a 3 phase aerial span on the left offset of the construction alignment (west side of the road), but does not cross the bridge. **These facilities will remain in place and active during the duration of this contract. No additional Delmarva Power involvement is anticipated.**

No relocation of these facilities is planned in this project scope. However, in an effort to help to ensure the safety of workers in proximity to our high voltage overhead conductors, the Delaware High Voltage Safety Act requires that if work will be performed within **20** feet of our overhead lines, OSHA requires an **Encroachment Prevention Plan**. Attached is a form that DP& L will supply in response to a request to begin that process as the contractor performing that work is required to request this information to adequately prepare their safety plan.

Contact Delmarva Power for the current Delmarva Power (Delaware) High Voltage Line Safety Operating Area Response Form 1.

VERIZON

Verizon owns and maintains an existing 50 pair aerial cable located on the left side of the construction alignment (northwest side of the road) and a 25 pair aerial cable located on the right side of the construction alignment (southeast side of the road), but both aerial spans stop before the bridge.

Impacts are not anticipated. **Existing Verizon facilities will remain in place and active during the duration of this contract.** Should adjustments or relocations be needed, they will be performed by Verizon after a minimum of fourteen (14) calendar days advanced notice from the State Contractor.

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

BRIDGE 3-161 on Poplar Street over Broad Creek

WINDSTREAM (CAVALIER)

Cavalier owns and maintains an existing aerial cable attached to the Delmarva Power poles located on left offset of the construction alignment (west side of the road).

Impacts are not anticipated. **Existing Cavalier facilities will remain in place and active during the duration of this contract.** Should adjustments or relocations be needed, they will be performed by Delmarva Power & Light, Electric after a minimum of fourteen (14) calendar days advanced notice from the State Contractor.

DELMARVA POWER & LIGHT, ELECTRIC (DP&L)

DP&L maintains a 3 phase aerial span on the left offset of the construction alignment (west side of the road). **These facilities will remain in place and active during the duration of this contract. No additional Delmarva Power involvement is anticipated.**

No relocation of these facilities is planned in this project scope. However, in an effort to help to ensure the safety of workers in proximity to our high voltage overhead conductors, the Delaware High Voltage Safety Act requires that if work will be performed within **20** feet of our overhead lines, OSHA requires an **Encroachment Prevention Plan**. Attached is a form that DP& L will supply in response to a request to begin that process as the contractor performing that work is required to request this information to adequately prepare their safety plan.

Contact Delmarva Power for the current Delmarva Power (Delaware) High Voltage Line Safety Operating Area Response Form 1.

VERIZON

Verizon owns and maintains an existing 200 pair aerial cable located on the right side of the construction alignment (east side of the road) that stops at Sta 3+10. An existing 100 pair aerial cable located on the right side of the construction alignment (east side of the road)that starts at Station 4+60 and continues north along Poplar Avenue. Both aerial spans do not cross the bridge.

Impacts are not anticipated. **Existing Verizon facilities will remain in place and active during the duration of this contract.** Should adjustments or relocations be needed, they will be performed by Verizon after a minimum of fourteen (14) calendar days advanced notice from the State Contractor.

GENERAL UTILITY NOTES

Outside of the companies and facilities discussed above, no additional utility involvement is anticipated. Should any conflicts be encountered as a result of the contractor's means and methods during construction requiring adjustment and/or relocation, the necessary relocation work shall be accomplished by the respective utility company and funded by the State's Contractor as directed by the District Engineer. The State Contractor shall coordinate any potential conflicts with utility companies and provide adequate notice prior to performing work. Any utility conflicts that are not readily discernable shall be coordinated by the State Contractor once the conflict is recognized. The time to complete any relocations/adjustments found to be necessary during construction of the highway project will depend on the nature of the work.

Once the State's contractor has given the Utility the advance notice required above, it is the responsibility of the State's contractor to have the work area prepared and accessible for the Utility to perform the tasks listed above. If the site conditions are not ready and the state contractor has given notice to the utility on when the work is to be accomplished, the State's Contractor shall be responsible for any extra cost incurred by the utility company and the State Contractor shall also be responsible for any time delays. Between when the required notice is given to the Utility and when the work is performed and completed, the coordination and scheduling of the Utility is the sole responsibility of the State's Contractor. All costs related to the coordination and scheduling of the utilities is incidental to the contract.

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

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 and operating 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 unless the delay is caused by the Contractor's delay in having the site conditions ready for the utility relocation work after the Contractor has provided the advance notice that the site conditions would be ready for the utility relocation work. The contractor's means and method of construction are not taken into account when known utility conflicts are identified. If the Contractor's means and method of construction create a utility conflict the Utility Statement will prevail in discussions with the utility and the Contractor. The State's Contractor shall be responsible for any costs associated with any temporary outages; holding, bracing and shielding of utility facilities; temporary relocations; or permanent relocations that are not specifically identified in this utility statement or shown in the contract plan set.**

4. **Coordination and cooperation among the Utility Companies and the State's Contractor are of prime importance. Therefore, the Contractor is directed to contact the 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 <u>not</u> work on weekends, <u>nights</u> or legal holidays.**

James Foskey	**City of Laurel**	**302-875-2277**
Mark Parker	**Chesapeake Utilities**	**302-734-6797**
Bo Royal	**Comcast Cable**	**302-841-6305**
William Whitaker	**DPL, Elec. Dist.**	**302-934-3356**
George Zang	**Verizon Delaware, LLC**	**302-422-1238**
Harry Sheppard	**Windstream (Cavalier)**	**302-224-7121**

5. **As outlined in Chapter 3 of the DelDOT Utilities Manual, individual utility companies are responsible for obtaining all required permits from municipal, State and federal government agencies and railroads. This includes but is not limited to water quality**

permits/DNREC Water Quality Certification, DNREC Subaqueous Lands/Wetlands permits, DNREC Coastal Zone Consistency Certification, County Floodplain permits (New Castle County only), U.S. Coast Guard permits, US Army Corps 404 permits, sediment and erosion permits, and railroad crossing permits.

6. **Individual utility companies are required to restore any areas disturbed in conjunction with their relocation work. If an area is disturbed by a utility company and is not properly restored, the Department may have the State's Contractor perform the necessary restoration. Any additional costs incurred as a result will be forwarded to the utility company.**
7. **16 Del. C. § 7405B requires notification to and mutually agreeable measures from the public utility operating the electric line for any person intending to carry on any function, activity, work or operation within dangerous proximity of any high voltage overhead electric lines. All contractors/other utilities must also maintain a minimum distance of 10'-0" from all energized lines. Additional clearance may be required from high voltage transmission lines.**
8. **Any existing facilities that are comprised of hazardous materials will be removed by the Utility Company unless otherwise outlined in the contract documents or language above. Any existing facilities containing hazardous materials will be purged by the Utility Company unless otherwise outlined in the contract documents or language above.**

DIVISION OF TRANSPORTATION SOLUTIONS

Conor Mitts — 8/21/17

UTILITY COORDINATOR — **DATE**

Deborah A. Kukelich — 8/21/2017

APPROVED TO FORM — **DATE**

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

CERTIFICATE OF RIGHT-OF-WAY STATUS

STATE PROJECT NO. T201407601

F.A.P. NO. EBHOS-S013(02)

BR 3-152 ON CENTRAL AVENUE AND BR 3-161 ON POPLAR STREET OVER BROAD CREEK

SUSSEX 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

March 10, 2017

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

JENNIFER COHAN
SECRETARY

September 12, 2017

STIPULATED ENVIRONMENTAL REQUIREMENTS

FOR
State Contract No. T201407601
Federal Aid No.: EBHOS-SO13(2)

Contract Title: BR 3-152 on Central Avenue and BR 3-161 on Poplar Street over Broad Creek

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.

PERMIT REQUIREMENTS:

The proposed construction work for this project requires permit approval from the agencies listed below. It is the responsibility of the contracting agency -- the Delaware Department of Transportation, Division of Transportation Solutions -- to obtain the necessary permits to ensure that the contractor complies with the requirements and conditions established by the regulatory agencies. Written authorization from the permitting agencies is required and paperwork for on-site posting is anticipated. The proposed work for this project will be authorized under the permits listed below:

REQUIRED PERMITS AND APPROVAL STATUS:

- U.S. Army Corps of Engineers (USACE) – Nationwide Permit #3 Pre-Construction Notification required - CENAP-OR-R-2016-1032-85, Issued April 5, 2017, Expires March 18, 2022
- Delaware Department of Natural Resources and Environmental Control (DNREC) Wetlands & Subaqueous Lands Section (WSLS) – SP-176/16, Issued May 11, 2017, Expires November 11, 1, 2019
- Delaware Coastal Zone Management (CZM) – Issued – Project is not located in a Critical Resource Water
- DNREC Water Quality Certification (WQC) - Issued – Project is not located in a Critical Resource Water
- U.S. Coast Guard (USCG) – Section 9 Permit - *****PENDING*****

SPECIFIC REQUIREMENTS:

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

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

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

2. All construction debris, excavated material, brush, rocks, and refuse incidental to the work shall be placed either on shore above the influence of flood waters or on some suitable disposal site approved by the department.

3. The disposal of trees, brush, and other debris in any stream corridor, wetland surface water or any drainage ditch is prohibited.

4. There shall be no stockpiling of construction materials or temporary fills in wetlands or subaqueous lands unless otherwise specified on project plans and approved by permitting agencies that govern them. It is the contractor's responsibility to coordinate and secure those additional permits/amendments in deviating from the plan.

5. Construction debris shall be kept from entering adjacent waterways, wetlands, ground cover, or drainage areas. Any debris that enters these areas shall be removed immediately. Netting, mats, or establishing confined work areas in stages may be necessary to address these issues.

6. Refuse material resulting from routine maintenance of worker equipment and heavy machinery is prohibited from being disposed or deposited onto or into the ground. All used oils and filters must be recycled or disposed of properly.

7. Use of harmful chemical wash water to clean equipment or machinery is discouraged. If undertaken, the residue water and/or material must be collected or contained such that it will be disposed of properly. It shall not be deposited or disposed of in waterways, streams, wetlands, or drainage areas.

8. The contractor shall follow all requirements as indicated in the Environmental Compliance Sheet. It is be the contractor's responsibility to ensure that workers also follow this requirement. As part of the restrictions, please note the timetables reflected in the contract for the in-stream/water work for endangered species protection.

9. Fill material shall be free of oil and grease, debris, wood, general refuse, plaster and other pollutants, and shall contain no broken asphalt.

ENVIRONMENTAL COMPLIANCE SHEET:

The contractor shall pay special attention to specific construction requirements as indicated in the US Army Corps of Engineer and DNREC Subaqueous Lands Permit as well as the Environmental Compliance (EC) Note and Plans (pages 74-76).

1. Specifically, please note the environmental requirements as indicated in the following notes:
   - Natural Resource Issues – See EC note 2.
     - Fisheries – No in-stream work between March 15th – June 1 and August 15 – November 1 due to the presence of Atlantic sturgeon and anadromous fish in Broad Creek.
     - Endangered Species – Take all efforts to decrease downstream sedimentation to protect northern lance mussels that have been documented to be in the area. Any preservatives or epoxies injected into the bridge must be marine stable and must be contained to ensure that they do not flow into the creek.
   - Cultural Resources –
     - Historic Bridges - Both BR 3-152 and BR 3-161 are eligible for the National Register of Historic Places. The DE-SHPO has confirmed that work on BR 3-152 will constitute and adverse effect. Maintaining the outward appearance of BR 3-152 is crucial; thus, any plan alteration or addition should first be coordinated with DelDOT's Environmental Studies Office. See EC note 3 for additional information.
     - Stockpiling/Staging – No stockpiling, staging or encroachment shall occur on the south bank of Broad Creek (and extending south from there). Moreover, staging/stockpiling outside the LOC that will cumulatively be larger than 10,000 square feet must be approved by DelDOT's archaeologist. See EC note 3 for additional information.
   - Stream Restoration and Slope Riprap treatment – See EC note 4.
   - USCG Advanced Coordination/Approval – The waterway is used for recreational purposes. The contractor shall provide safe passage through the work area for waterway users and shall have the passageway clearly marked. See EC note 5 for additional information about coordinating with the USCG in the event a short-term restriction will occur.
   - Protection of Resources – See EC note 5.
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.: T201407601

Federal Aid No.: EBHOS-S013(02)

Project Title: BR 3-152 on Central Avenue and BR 3-161 on Poplar Street Over Broad Creek Sussex County

The following railroad companies maintain facilities within the contract limits:

- ☐ Amtrak
- ☐ CSX
- ☐ Delaware Coast Line
- ☐ East Penn
- ☐ Maryland & Delaware
- ☐ Norfolk Southern
- ☐ Wilmington & Western
- ☑ 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 DelDOT Maintenance of Railroad Traffic Item in the Special Provisions. Contractor shall coordinate railroad flagging with DelDOT'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 DelDOT Maintenance of Railroad Traffic Item in the Special Provisions. Contractor shall coordinate railroad flagging with DelDOT's Railroad Program Manager at (302) 760-2183.

Approved As To Form:

Robert A. Perrihe
DelDOT Railroad Program Manager

14 April, 2016
DATE

BID PROPOSAL FORMS

CONTRACT T201407601.01

FEDERAL AID PROJECT EBHOS-S013(02)

UNLESS OTHERWISE DIRECTED, SUBMIT ALL FOLLOWING PAGES TO:

DEPARTMENT OF TRANSPORTATION
BIDDERS ROOM (B1.11.01)
800 BAY ROAD
DOVER, DELAWARE 19901

Identify the following on the outside of the sealed envelope:

- Contract Number T201407601.01

- Name of Contractor

CONTRACT ID: T201407601.01 PROJECT(S): EBHOS-S013(02)

All figures must be typewritten.

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SECTION 0001 BR 3-161					
0010	201000 CLEARING AND GRUBBING	LUMP	LUMP			
0020	211000 REMOVAL OF STRUCTURES AND OBSTRUCTIONS	LUMP	LUMP			
0030	401801 BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 160 GYRATIONS PG 64-22 (CARBONATE STONE)	110.000 TON				
0040	601002 TIMBER STRUCTURES (TREATED)	1.040 MFBM				
0050	601505 TIMBER PIER REHABILITATION	LUMP	LUMP			
0060	605522 URETHANE PAINT SYSTEM, EXISTING STEEL	LUMP	LUMP			
0070	605533 CLEANING EXISTING STEEL STRUCTURES, HAZARDOUS BASE, (L.S.)	LUMP	LUMP			
0080	605578 REPLACING STEEL RIVETS/BOLTS	115.000 EACH				
0090	605581 ELASTOMERIC BRIDGE BEARING PAD	6.000 EACH				

CANNOT BE USED FOR BIDDING

CONTRACT ID: T201407601.01 PROJECT(S): EBHOS-S013(02)

All figures must be typewritten.

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0100	605585 STEEL STRUCTURE REPAIR	LUMP	LUMP			
0110	605607 JACKING BRIDGE	LUMP	LUMP			
0120	606508 STEEL HAND RAIL REPAIR	220.000 LF				
0130	743004 FURNISH AND MAINTAIN PORTABLE CHANGEABLE MESSAGE SIGN	30.000 EADY				
0140	743058 FLAGGER, SUSSEX COUNTY, FEDERAL	80.000 HOUR				
0150	743067 FLAGGER, SUSSEX COUNTY, FEDERAL, OVERTIME	20.000 HOUR				
0160	748548 PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 5"	800.000 LF				
0170	760006 PAVEMENT - MILLING, HOT-MIX, 2" DEPTH	965.000 SY				
0180	762001 SAW CUTTING, BITUMINOUS CONCRETE	885.000 LF				
0190	763000 INITIAL EXPENSE	LUMP	LUMP			

CANNOT BE USED FOR BIDDING

CONTRACT ID: T201407601.01 PROJECT(S): EBHOS-S013(02)

All figures must be typewritten.

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0200	763501 CONSTRUCTION ENGINEERING	LUMP	LUMP			
0210	763522 COAST GUARD SPECIFIC CONDITIONS	LUMP	LUMP			
0220	763623 NETTING MIGRATORY BIRD EXCLUSION	LUMP	LUMP			
0230	763643 MAINTENANCE OF TRAFFIC, ALL INCLUSIVE	LUMP	LUMP			
	SECTION 0001 TOTAL					

SECTION 0002 BR 3-152

0240	202000 EXCAVATION AND EMBANKMENT	245.000 CY				
0250	207000 EXCAVATION AND BACKFILL FOR STRUCTURES	397.000 CY				
0260	208000 EXCAVATION AND BACKFILLING FOR PIPE TRENCHES	177.000 CY				
0270	209002 BORROW, TYPE B	6.000 CY				

CANNOT BE USED FOR BIDDING

CONTRACT ID: T201407601.01 PROJECT(S): EBHOS-S013(02)

All figures must be typewritten.

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0280	210000 FURNISHING BORROW TYPE "C" FOR PIPE, UTILITY TRENCH, AND STRUCTURE BACKFILL	307.000 CY				
0290	211000 REMOVAL OF STRUCTURES AND OBSTRUCTIONS	LUMP	LUMP			
0300	302005 GRADED AGGREGATE BASE COURSE, TYPE B	498.000 TON				
0310	302012 DELAWARE NO. 57 STONE	6.000 TON				
0320	401801 BITUMINOUS CONCRETE, SUPERPAVE, TYPE C, 160 GYRATIONS PG 64-22 (CARBONATE STONE)	120.000 TON				
0330	401810 BITUMINOUS CONCRETE, SUPERPAVE, TYPE B, 160 GYRATIONS, PG 64-22	92.000 TON				
0340	401819 BITUMINOUS CONCRETE, SUPERPAVE, BITUMINOUS CONCRETE BASE COURSE, 160 GYRATIONS, PG 64-22	121.000 TON				
0350	601502 TEMPORARY PROTECTIVE SHIELD	LUMP	LUMP			
0360	601535 TIMBER SIDEWALK (COMPOSITE)	625.000 SF				

CANNOT BE USED FOR BIDDING

CONTRACT ID: T201407601.01 PROJECT(S): EBHOS-S013(02)

All figures must be typewritten.

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS		UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0370	602003 PORTLAND CEMENT CONCRETE MASONRY, ABUTMENT FOOTING, CLASS A	19.000	CY				
0380	602007 PORTLAND CEMENT CONCRETE MASONRY, PIER ABOVE FOOTING, CLASS A	53.000	CY				
0390	602013 PORTLAND CEMENT CONCRETE MASONRY, SUPERSTRUCTURE, CLASS D	75.000	CY				
0400	602014 PORTLAND CEMENT CONCRETE MASONRY, APPROACH SLAB, CLASS D	65.000	CY				
0410	602015 PORTLAND CEMENT CONCRETE MASONRY, ABUTMENT ABOVE FOOTING, CLASS A	70.000	CY				
0420	602016 PORTLAND CEMENT CONCRETE MASONRY, CLASS C	4.000	CY				
0430	602017 PORTLAND CEMENT CONCRETE MASONRY, PARAPET, CLASS A	40.000	CY				
0440	602579 DRILLING HOLES AND INSTALLING DOWELS	475.000	EACH				
0450	602586 REHABILITATION OF CONCRETE STRUCTURE	3.000	CF				
0460	602611 REPAIR OF CONCRETE STRUCTURES BY EPOXY INJECTION	18.000	LF				

CANNOT BE USED FOR BIDDING

CONTRACT ID: T201407601.01 PROJECT(S): EBHOS-S013(02)

All figures must be typewritten.

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0470	602797 PCC MASONRY LINK SLAB	7.000 CY				
0480	604000 BAR REINFORCEMENT, EPOXY COATED	60200.000 LB				
0490	605002 STEEL STRUCTURES	LUMP	LUMP			
0500	605522 URETHANE PAINT SYSTEM, EXISTING STEEL	LUMP	LUMP			
0510	605533 CLEANING EXISTING STEEL STRUCTURES, HAZARDOUS BASE, (L.S.)	LUMP	LUMP			
0520	605585 STEEL STRUCTURE REPAIR	LUMP	LUMP			
0530	605607 JACKING BRIDGE	LUMP	LUMP			
0540	605706 FURNISHING AND INSTALLING COMPRESSION SEAL	120.000 LF				
0550	606003 METAL BRIBGE RAILING (PEDESTRIAN)	110.000 LF				
0560	612021 REINFORCED CONCRETE PIPE, 15", CLASS IV	32.000 LF				

CANNOT BE USED FOR BIDDING

CONTRACT ID: T201407601.01 PROJECT(S): EBHOS-S013(02)

All figures must be typewritten.

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0570	612034 REINFORCED CONCRETE PIPE, 36", CLASS IV	88.000 LF				
0580	619520 DRILLED MICROPILES	2080.000 LF				
0590	619521 MICROPILE LOAD TESTING	3.000 EACH				
0600	623000 PRESTRESSED REINFORCED CONCRETE MEMBERS	LUMP	LUMP			
0610	701013 PORTLAND CEMENT CONCRETE CURB, TYPE 1-2	62.000 LF				
0620	705001 P.C.C. SIDEWALK, 4"	499.000 SF				
0630	708051 DRAINAGE INLET, 34" X 24"	3.000 EACH				
0640	708056 DRAINAGE INLET, 66" X 66"	1.000 EACH				
0650	708112 MANHOLE, 48" X 48"	1.000 EACH				
0660	710001 ADJUSTING AND REPAIRING EXISTING DRAINAGE INLET	1.000 EACH				
0670	710506 ADJUST AND REPAIR EXISTING SANITARY MANHOLE	6.000 EACH				

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All figures must be typewritten.

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0680	712021 RIPRAP, R-5	108.000 TON				
0690	715001 PERFORATED PIPE UNDERDRAINS, 6"	402.000 LF				
0700	720044 GALVANIZED STEEL BEAM GUARDRAIL, TYPE 2-27	16.000 LF				
0710	720055 CURVED GUARDRAIL SECTION	14.000 LF				
0720	720585 GUARDRAIL END TREATMENT ATTENUATOR, TYPE 1-31	1.000 EACH				
0730	725002 GUARDRAIL TO BARRIER CONNECTION, APPROACH TYPE 1-31	1.000 EACH				
0740	725007 GUARDRAIL TO BARRIER CONNECTION , APPROACH TYPE 2-27	1.000 EACH				
0750	726005 END ANCHORAGE, 27	1.000 EACH				
0760	743004 FURNISH AND MAINTAIN PORTABLE CHANGEABLE MESSAGE SIGN	30.000 EADY				
0770	743058 FLAGGER, SUSSEX COUNTY, FEDERAL	80.000 HOUR				

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CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0780	743067 FLAGGER, SUSSEX COUNTY, FEDERAL, OVERTIME	20.000 HOUR				
0790	748548 PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 5"	1197.000 LF				
0800	748557 PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, BLACK, 3"	266.000 LF				
0810	749687 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE SIGN POST	13.000 EACH				
0820	758000 REMOVAL OF EXISTING PORTLAND CEMENTCONCRETE PAVEMENT, CURB, SIDEWALK, ETC.	79.000 SY				
0830	760006 PAVEMENT - MILLING, HOT-MIX, 2" DEPTH	73.000 SY				
0840	762001 SAW CUTTING, BITUMINOUS CONCRETE	822.000 LF				
0850	762002 SAW CUTTING, CONCRETE, FULL DEPTH	150.000 LF				
0860	763000 INITIAL EXPENSE	LUMP	LUMP			
0870	763501 CONSTRUCTION ENGINEERING	LUMP	LUMP			

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All figures must be typewritten.

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0880	763522 COAST GUARD SPECIFIC CONDITIONS	LUMP	LUMP			
0890	763623 NETTING MIGRATORY BIRD EXCLUSION	LUMP	LUMP			
0900	763643 MAINTENANCE OF TRAFFIC, ALL INCLUSIVE	LUMP	LUMP			
0910	905001 SILT FENCE	131.000 LF				
0920	905004 INLET SEDIMENT CONTROL, DRAINAGE INLET	5.000 EACH				
0930	906002 DEWATERING BAG	6.000 EACH				
0940	906003 SUMP PIT	1.000 EACH				
0950	908004 TOPSOIL, 6" DEPTH	204.000 SY				
0960	908014 PERMANENT GRASS SEEDING, DRY GROUND	204.000 SY				
0970	908017 TEMPORARY GRASS SEEDING	204.000 SY				
0980	908020 EROSION CONTROL BLANKET MULCH	204.000 SY				
0990	909004 TURBIDITY CURTAIN, FLOATING	170.000 LF				
	SECTION 0002 TOTAL					
	TOTAL BID					

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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:

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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, NOTARIZED, AND RETURNED WITH YOUR BID.

CERTIFICATION

Contract No. T201407601.01
Federal Aid Project No. EBHOS-S013(02)

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.

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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 prosection or administrative sanctions.

_____

_____

_____

(Insert Exceptions)

DBE Program Assurance:

NOTICE: In accordance with 49 CFR Part 26 the undersigned, a legally authorized representative of the bidder listed below, must complete this assurance.

By its signature affixed hereto, assures the Department that it will attain DBE participation as indicated:

Disadvantaged Business Enterprise _____ percent (blank to be filled in by bidder)

The foregoing quantities are considered to be approximate only and are given as the basis for comparison of bids. The Department of Transportation may increase or decrease the amount of any item or portion of the work as may be deemed necessary or expedient. Any such increase or decrease in the quantity for any item will not be regarded as a sufficient ground for an increase or decrease in the unit prices, nor in the time allowed for the completion of the work, except as provided in the contract.

Accompanying this proposal is a surety bond or a security of the bidder assigned to the Department of Transportation, for at least ten (10) percentum of total amount of the proposal, which deposit is to be forfeited as liquidated damages in case this proposal is accepted, and the undersigned shall fail to execute a contract with necessary bond, when required, for the performance of said contract with the Department of Transportation, under the conditions of this proposal, within twenty (20) days after date of official notice of the award of the contract as provided in the requirement and specifications hereto attached; otherwise said deposit is to be returned to the undersigned.

I/We are licensed, or have initiated the license application as required by Section 2502, Chapter 25, Title 30, of the Delaware Code.

By submission of this proposal, each person signing on behalf of the bidder, certifies as to its own organization, under penalty of perjury, that to the best of each signer's knowledge and belief:

1. The prices in this proposal have been arrived at independently without collusion, consultation, communication, or Agreement with any other bidder or with any competitor for the purpose of restricting competition.
2. Unless required by law, the prices which have been quoted in this proposal have not been knowingly disclosed and will not knowingly be disclosed by the bidder, directly or indirectly, to any other bidder or competitor prior to the opening of proposals.
3. No attempt has been made or will be made by the bidder to induce any other person, partnership, or corporation to submit or not to submit a proposal for the purpose of restricting competition.

==========

I/We acknowledge receipt and incorporation of addenda to this proposal as follows:

No. Date No. Date No. Date No. Date No. Date

_____ _____ _____ _____ _____

BIDDERS MUST ACKNOWLEDGE RECEIPT OF ALL ADDENDA

MUST INSERT DATE OF FINAL QUESTIONS AND ANSWERS ON WEBSITE: _____

==========

Sealed and dated this _____ day of _____ in the year of our Lord two thousand _____ (20___).

_____
Name of Bidder (Organization)

Corporate Seal

By: _____
Authorized Signature

Attest _____

_____
Title

SWORN TO AND SUBSCRIBED BEFORE ME this ___ day of _____, 20____.

Notary Seal

_____
Notary

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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. T201407601.01, 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

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