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YOU MUST PURCHASE
THE PROPOSAL IN ORDER
TO SUBMIT A BID.



DEPARTMENT OF TRANSPORTATION

BID PROPOSAL

for

CONTRACT T201007405.01

FEDERAL AID PROJECT NO. EBHN-2010(29)

**BRS 1-687, 1-688, 1-693 SOUTH WALNUT ST. SOUTH MARKET ST.
NEW CASTLE COUNTY**

Completion Date 376 Calendar Days

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

Bids will be received in the Bidder's Room, Transportation Administration Center, 800 Bay Road, Dover, Delaware until 2:00 P.M. local time July 12, 2011

Contract No.T201007405.01

Federal Aid Project No. EBHN-2010(29)

**BRS 1-687, 1-688, 1-693 SOUTH WALNUT ST. SOUTH MARKET ST.
NEW CASTLE COUNTY**

LOCATION

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

DESCRIPTION

The improvements consist of furnishing all materials for BRIDGES 1-687, 1-688, 1-693 SOUTH WALNUT ST., SOUTH MARKET ST. AND FOURTH ST. OVER CHRISTINA RIVER - WORK CONSISTS OF TRUNNION COLUMN BRACING REPAIR, LIVE LOAD HOLD DOWN ANCHORAGE REPAIR, GENERAL MAINTENANCE TYPE STEEL RUST REMOVAL, CONCRETE SPALL REPAIRS, ELECTRICAL AND MECHANICAL REPAIR WORK FOR THE MACHINERY., and other incidental construction in accordance with the location, notes and details shown on the plans and as directed by the Engineer.

COMPLETION DATE

All work on this contract must be complete within 376 Calendar Days . The Contract Time includes an allowance for 57 Weather Days.

It is the Department's intent to issue a Notice to Proceed such that work starts on or about September 26, 2011.

ELECTRONIC BIDDING

This project incorporates the electronic bidding system Expedite 5.2b. Bidder wishing to use the electronic bidding option should request a bid file disk and installation CD.

PROSPECTIVE BIDDERS NOTE:

1. No retainage will be withheld on this contract.
2. The Department has adopted an External Complaint Procedure. The procedure can be viewed on our website at; <http://www.deldot.gov/information/business/>, or you may request a copy by calling (302) 760-2555.

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.

**STATE OF DELAWARE
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 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.

REQUIREMENT BY DEPARTMENT OF LABOR FOR SWORN PAYROLL INFORMATION

Delaware Code, Title 29, Chapter 69, Section 6960, Paragraph

"Every contract based upon these specifications shall contain a stipulation that certified sworn payroll reports be maintained by every contractor and subcontractor performing work upon the site of construction. The contractor and subcontractor shall keep and maintain the sworn payroll information for a period of two (2) years from the last day of the work week covered by the payroll. A certified copy of these payroll reports shall be made available:

1. For inspection or furnished upon request to a representative of the Department of Labor;
2. Upon request by the public or for copies thereof. However, a request by the public must be made through the Department of Labor. The requesting party shall, prior to being provided the records, reimburse the costs of preparation by the Department of Labor in accordance with the Department's copying fee policy. The public shall not be given access to the records at the principal office of the contractor or subcontractor; and
3. The certified payroll records shall be on a form provided by the Department of Labor or shall contain the same information as the form provided by the Department and shall be provided within ten (10) days from receipt of notice requesting the records from the Department of Labor."

Contractor may contact: Department of Labor
Division of Industrial Affairs
4425 No. Market Street
Wilmington, DE 19802

Telephone (302) 761-8200

PREFERENCE FOR DELAWARE LABOR:

Delaware Code, Title 29, Chapter 69, Section 6962, Paragraph (d), Subsection (4)b

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

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."

For all contracts which are identified as Federal-aid projects by having a Federal-aid number inserted in the appropriate space on the cover sheet of the proposal, if there is a conflict between the above Section 6962 and Federal law and the requirements of the above Section 6962 shall not apply.

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."

EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS:

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

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

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

i. The contractor will not discriminate against any employee or applicant for employment because of race, creed, color, sex or natural origin. The contractor will take positive steps to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, creed, color, sex 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.

ii. The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, sex or national origin.'

TAX CLEARANCE:

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

LICENSE:

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

TO REPORT BID RIGGING ACTIVITIES:

CALL 1-800-424-9071

The U. S. Department of Transportation (DOT) operates the above 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.

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.

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:

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

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

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

be a violation of the contract, the Executive Order, and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

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

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

REV. 11-3-80

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

1. As used in these specifications:

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

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

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

4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through 7p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered Construction contractors performing construction work in geographical areas where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published

periodically in the Federal Register in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Program Office or from the Federal procurement contracting offices. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.

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

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

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

a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.

d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.

f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff,

termination or other employment decisions including specific review of these items with on-site supervisory personnel such as Superintendents, General Foreman, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.

i. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's work force.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

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

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

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

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

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

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

may be in violation of the Executive Order if a specific minority group of women is under utilized).

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

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

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

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

14. The Contractor shall designate a responsible official to monitor all employment-related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government, and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

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

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TRAINING SPECIAL PROVISIONS

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

As part of the contractor's equal employment opportunity affirmative action program, training shall be provided as follows:

The contractor shall provide on-the-job training aimed at developing full journeyman in the type of trade or job classification involved. The number of trainees to be trained under the special provision will be 2. 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 clerical-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 provided 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 7 % Percent

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

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

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

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

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

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CRITICAL DBE REQUIREMENTS

A bid may be held to be non-responsive and not considered if the required DBE information is not

provided. In addition, the bidder may lose its bidding capability on Department projects and such other sanctions as the Department may impose. It is critical that the bidder understands:

1. In the event that the bidder cannot meet the DBE goal as set forth in this specification, he/she shall at the time of bid submit to the Department that percentage of the DBE Goal that will be met, if any, on the written and notarized assurance made a part of this contract. The contractor shall also at the time of bid submit all documentation that the contractor wishes to have the Department consider in determining that the contractor made a Good Faith Effort to meet contract DBE Goals. The Department will not accept Good Faith Effort documentation other than on the scheduled date and time of the bid opening. However, the Department may ask for clarification of information submitted should the need arise.

2. A bid which does not contain either a completely executed DBE Program Assurance and/or Good Faith Effort documentation, where appropriate, shall be declared non-responsive and shall not be considered by the Department.

3. Bidders shall submit with their bid the name, address, age of the firm, and the gross annual receipts of each DBE and non-DBE subcontractor that supplied a quote or a bid to the prime on this project. The Department has attached this document following the Certification document at the end of the Proposal. Failure to submit this information will result in the bid being declared non-responsive and will be rejected.

4. Failure of the apparent low bidder to present originals of all DBE subcontracts to substantiate the volume of work to be performed by DBE's as indicated in the bid within ten (10) calendar days after the bid opening shall create a rebuttable presumption that the bid is not responsive.

5. 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.

6. 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.

7. 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

8. In addition to this specification, bidders must comply with all provisions of the rules and regulations adopted by the U.S. Department of Transportation for DBE participation in U.S. DOT and DelDOT Programs (49 CFR Part 26) and the Delaware Department of Transportation Disadvantaged

Business Enterprise Program Plan; each of which is hereby incorporated and made part of this specification. Bidders are also reminded that they must be responsible and responsive bidders in all other aspects aside from the DBE Program in order to be awarded the contract.

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GUIDANCE FOR GOOD FAITH EFFORT

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

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

1. Efforts made to select portions of the work proposed to be performed by DBEs in order to increase the likelihood of achieving the stated goal. Selection of portions of work are required to at least equal the goal for DBE utilization specified in this contract.
2. Written notification at least ten (10) calendar days prior to the opening of a bid soliciting DBE interest in participating in the contract as a subcontractor or supplier and for specific items of work.
3. Efforts made to obtain and negotiate with DBE firms for specific items of work:
 - a. Description of the means by which firms were solicited (i.e. by telephone, e-mail, written notice, advertisement).
 - b. The names, addresses, telephone numbers of DBE's contacted, the dates of initial contact; and whether initial solicitations of interest were followed-up by contacting the DBEs to determine with certainty whether the DBEs were interested.
 - c. A description of the information provided to DBE firms regarding the plans, specifications and estimated quantities for portions of the work to be performed.
 - d. A statement of why additional agreements with DBE's were not reached in order to meet the projected goal.
 - e. Listing of each DBE contacted but not contracted and the reasons for not entering a contract.
4. Efforts made to assist DBEs that need assistance in obtaining bonding, insurance, or lines of credit required by the contractor.
5. Reasons why certified DBEs are not available or not interested.
6. Efforts to effectively use the services of available disadvantaged community organizations; disadvantaged contractor's groups; local, state and federal DBE assistance offices; and other organizations that provide assistance in recruitment and placement of DBEs.

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

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

Administrative reconsideration:

Within five (5) days of being informed by DeIDOT 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, DeIDOT, 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)

I. GENERAL

1. 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.

2. Except as otherwise provided for in each section, the contractor shall insert in each subcontract all of the stipulations contained in these Required Contract Provisions, and further require their inclusion in any lower tier subcontract or purchase order that may in turn be made. The Required Contract Provisions shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with these Required Contract Provisions.

3. A breach of any of the stipulations contained in these Required Contract Provisions shall be sufficient grounds for termination of the contract.

4. A breach of the following clauses of the Required Contract Provisions may also be grounds for debarment as provided in 29 CFR 5.12:

Section I, paragraph 2;
Section IV, paragraphs 1, 2, 3, 4, and 7;
Section V, paragraphs 1 and 2a through 2g.

5. Disputes arising out of the labor standards provisions of Section IV (except paragraph 5) and Section V of these Required Contract Provisions shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the U.S. Department of Labor (DOL) as set forth in 29 CFR 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 DOL, or the contractor's employees or their representatives.

6. **Selection of Labor:** During the performance of this contract, the contractor shall not:

a. discriminate against labor from any other State, possession, or territory of the United States (except for employment preference for Appalachian contracts, when applicable, as specified in Attachment A), or

b. employ convict labor for any purpose within the limits of the project unless it is labor performed by convicts who are on parole, supervised release, or probation.

II. NONDISCRIMINATION

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

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 and 41 CFR 60) 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 Equal Opportunity Construction Contract Specifications set forth under 41 CFR 60-4.3 and the provisions of the American 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 State highway agency (SHA) and the Federal Government in carrying out EEO obligations and in their review of his/her activities under the contract.
- b. The contractor will accept as his 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, preapprenticeship, and/or on-the-job training."

2. **EEO Officer:** The contractor will designate and make known to the SHA contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of EEO 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 minority group employees.
- 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 minority groups 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 minority group applicants. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group 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, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions. (The DOL has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)

c. The contractor will encourage his present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group 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 his 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 his avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.

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. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision.

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 minority group and women employees 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 his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. 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 best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.
- b. The contractor will use best 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 SHA 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 minority and women 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 minority group persons and women. (The DOL has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) 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 SHA.

8. 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.

- a. The contractor shall notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.
- b. Disadvantaged business enterprises (DBE), as defined in 49 CFR 23, shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The contractor will use his best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of DBE construction firms from SHA personnel.
- c. The contractor will use his best efforts to ensure subcontractor compliance with their EEO obligations.

9. 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 completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the SHA and the FHWA.

- a. The records kept by the contractor shall document the following:
 - (1) The number 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;

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and

(4) The progress and efforts being made in securing the services of DBE subcontractors or subcontractors with meaningful minority and female representation among their employees.

b. The contractors will submit an annual report to the SHA 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. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data.

III. NONSEGREGATED FACILITIES

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

a. By submission of this bid, the execution of this contract or subcontract, or the consummation of this material supply agreement or purchase order, as appropriate, the bidder, Federal-aid construction contractor, subcontractor, material supplier, or vendor, as appropriate, certifies that the firm does not maintain or provide for its employees any segregated facilities at any of its establishments, and that the firm does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The firm agrees that a breach of this certification is a violation of the EEO provisions of this contract. The firm further certifies that no employee will be denied access to adequate facilities on the basis of sex or disability.

b. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, timeclocks, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive, or are, in fact, segregated on the basis of race, color, religion, national origin, age or disability, because of habit, local custom, or otherwise. The only exception will be for the disabled when the demands for accessibility override (e.g. disabled parking).

c. The contractor agrees that it has obtained or will obtain identical certification from proposed subcontractors or material suppliers prior to award of subcontracts or consummation of material supply agreements of \$10,000 or more and that it will retain such certifications in its files.

IV. PAYMENT OF PREDETERMINED MINIMUM WAGE

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural minor collectors, which are exempt.)

1. General:

a. All mechanics and laborers 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 (29 CFR 3) issued by the Secretary of Labor under the Copeland Act (40 U.S.C. 276c)] the full amounts of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment. The payment shall be computed at wage rates not less than those contained in the wage determination of the Secretary of Labor (hereinafter "the wage determination") which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor or its subcontractors and such laborers and mechanics. The wage determination (including any additional classifications and wage rates

conformed under paragraph 2 of this Section IV and the DOL poster (WH-1321) or Form FHWA-1495) 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. For the purpose of this Section, contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act (40 U.S.C. 276a) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section IV, paragraph 3b, hereof. Also, for the purpose of this Section, 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 paragraphs 4 and 5 of this Section IV.

b. 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.

c. All rulings and interpretations of the Davis-Bacon Act and related acts contained in 29 CFR 1, 3, and 5 are herein incorporated by reference in this contract.

2. Classification:

a. The SHA contracting officer shall require that any class of laborers or mechanics employed under the contract, which is not listed in the wage determination, shall be classified in conformance with the wage determination.

b. The contracting officer shall approve an additional classification, wage rate and fringe benefits only when the following criteria have been met:

(1) the work to be performed by the additional classification requested is not performed by a classification in the wage determination;

(2) the additional classification is utilized in the area by the construction industry;

(3) the proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and

(4) with respect to helpers, when such a classification prevails in the area in which the work is performed.

c. If the contractor or subcontractors, as appropriate, the laborers and mechanics (if known) to be employed in the additional classification 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 DOL, Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, D.C. 20210. The Wage and Hour 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.

d. In the event the contractor or subcontractors, as appropriate, the laborers or mechanics to be employed in the additional 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. Said 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.

e. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 2c or 2d of this Section IV shall be paid to all workers performing work in the additional classification from the first day on which work is performed in the classification.

3. Payment of Fringe Benefits:

a. 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 or subcontractors, as appropriate, shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly case equivalent thereof.

b. If the contractor or subcontractor, as appropriate, does not make payments to a trustee or other third person, he/she may consider as a 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.

4. Apprentices and Trainees (Programs of the U.S. DOL) and Helpers:

a. Apprentices:

(1) 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 DOL, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau, or if a person is employed in his/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 Bureau of Apprenticeship and Training or a State apprenticeship agency (where appropriate) to be eligible for probationary employment as an apprentice.

(2) The allowable ratio of apprentices to journeyman-level employees 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 employee 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 listed in 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 or subcontractor 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-level hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

(3) 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 journeyman-level 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 for the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

(4) In the event the Bureau of Apprenticeship and Training, or a State

apprenticeship agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor or subcontractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the comparable work performed by regular employees until an acceptable program is approved.

b. Trainees:

(1) 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 DOL, Employment and Training Administration.

(2) The ratio of trainees to journeyman-level employees on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. 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.

(3) Every trainee must be paid at not less than the rate specified in the approved program for his/her level of progress, expressed as a percentage of the journeyman-level 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-level wage rate on the wage determination which provides for less than full fringe benefits for apprentices, in which case such trainees shall receive the same fringe benefits as apprentices.

(4) In the event the Employment and Training Administration withdraws approval of a training program, the contractor or subcontractor 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. Helpers:

Helpers will be permitted to work on a project if the helper classification is specified and defined on the applicable wage determination or is approved pursuant to the conformance procedure set forth in Section IV.2. Any worker listed on a payroll at a helper wage rate, who is not a helper under an approved definition, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed.

5. 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.

6. Withholding:

The SHA shall upon its own action or upon written request of an authorized representative

of the DOL withhold, or cause to be withheld, from the contractor or subcontractor 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, as 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 SHA contracting officer 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.

7. Overtime Requirements:

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen, or guards (including apprentices, trainees, and helpers described in paragraphs 4 and 5 above) shall require or permit any laborer, mechanic, watchman, or guard in any workweek in which he/she is employed on such work, to work in excess of 40 hours in such workweek unless such laborer, mechanic, watchman, or guard receives compensation at a rate not less than one-and-one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

8. Violation:

Liability for Unpaid Wages; Liquidated Damages: In the event of any violation of the clause set forth in paragraph 7 above, the contractor and any subcontractor responsible thereof shall be liable to the affected employee for his/her 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, mechanic, watchman, or guard employed in violation of the clause set forth in paragraph 7, in the sum of \$10 for each calendar day on which such employee was required or permitted to work in excess of the standard work week of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 7.

9. Withholding for Unpaid Wages and Liquidated Damages:

The SHA shall upon its own action or upon written request of any authorized representative of the DOL withhold, or cause to be withheld, from any monies 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 8 above.

V. STATEMENTS AND PAYROLLS

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural collectors, which are exempt.)

1. Compliance with Copeland Regulations (29 CFR 3):

The contractor shall comply with the Copeland Regulations of the Secretary of Labor which are herein incorporated by reference.

2. Payrolls and Payroll Records:

a. Payrolls and basic records relating thereto shall be maintained by the contractor and

each subcontractor during the course of the work and preserved for a period of 3 years from the date of completion of the contract for all laborers, mechanics, apprentices, trainees, watchmen, helpers, and guards working at the site of the work.

b. The payroll records shall contain the name, social security number, and address of each such employee; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalent 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. In addition, for Appalachian contracts, the payroll records shall contain a notation indicating whether the employee does, or does not, normally reside in the labor area as defined in Attachment A, paragraph 1. Whenever the Secretary of Labor, pursuant to Section IV, paragraph 3b, has found 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 and each subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, that the plan or program has been communicated in writing to the laborers or mechanics affected, and show the cost anticipated or the actual cost incurred in providing benefits. Contractors or subcontractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprentices and trainees, and ratios and wage rates prescribed in the applicable programs.

c. Each contractor and subcontractor shall furnish, each week in which any contract work is performed, to the SHA resident engineer a payroll of wages paid each of its employees (including apprentices, trainees, and helpers, described in Section IV, paragraphs 4 and 5, and watchmen and guards engaged on work during the preceding weekly payroll period). The payroll submitted shall set out accurately and completely all of the information required to be maintained under paragraph 2b of this Section V. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.

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

(1) that the payroll for the payroll period contains the information required to be maintained under paragraph 2b of this Section V, and that such information is correct and complete;

(2) that such 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 the Regulations, 29 CFR 3;

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

e. 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 2d of this Section V.

f. The falsification of any of the above certifications may subject the contractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.

g. The contractor or subcontractor shall make the records required under paragraph 2b of this Section V available for inspection, copying, or transcription by authorized representatives of the SHA, the FHWA, or the DOL, 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 SHA, the FHWA, the DOL, or all may, after written notice to the contractor, sponsor, applicant, or owner, take such actions 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.

VI. RECORD OF MATERIALS, SUPPLIES, AND LABOR

1. On all Federal-aid contracts on the National Highway System, except those which provide solely for the installation of protective devices at railroad grade crossings, those which are constructed on a force account or direct labor basis, highway beautification contracts, and contracts for which the total final construction cost for roadway and bridge is less than \$1,000,000 (23 CFR 635) the contractor shall:
 - a. Become familiar with the list of specific materials and supplies contained in Form FHWA-47, "Statement of Materials and Labor Used by Contractor of Highway Construction Involving Federal Funds," prior to the commencement of work under this contract.
 - b. Maintain a record of the total cost of all materials and supplies purchased for and incorporated in the work, and also of the quantities of those specific materials and supplies listed on Form FHWA-47, and in the units shown on Form FHWA-47.
 - c. Furnish, upon the completion of the contract, to the SHA resident engineer on Form FHWA-47 together with the data required in paragraph 1b relative to materials and supplies, a final labor summary of all contract work indicating the total hours worked and the total amount earned.
2. At the prime contractor's option, either a single report covering all contract work or separate reports for the contractor and for each subcontract shall be submitted.

VII. SUBLETTING OR ASSIGNING THE CONTRACT

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 State. 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).
 - a. "Its own organization" shall be construed to include only workers employed and paid directly 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, assignee, or agent of the prime contractor.
 - 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 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 VII 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 SHA 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 SHA 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 SHA has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

VIII. SAFETY: ACCIDENT PREVENTION

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 SHA 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. 333).

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. 333).

IX. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

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, the following notice 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:

NOTICE TO ALL PERSONNEL ENGAGED ON FEDERAL-AID HIGHWAY PROJECTS

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 not more than \$10,000 or imprisoned not more than 5 years or both."

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

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$100,000 or more.)

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

1. That any facility that is or will be utilized in the performance of this contract, unless such contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 *et seq.*, as amended by Pub.L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 *et seq.*, as amended by Pub.L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 CFR 15) is not listed, on the date of contract award, on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 CFR 15.20.
2. That the firm agrees to comply and remain in compliance with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations and guidelines listed thereunder.
3. That the firm shall promptly notify the SHA of the receipt of any communication from the Director, Office of Federal Activities, EPA, indicating that a facility that is or will be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.
4. That the firm agrees to include or cause to be included the requirements of paragraph 1 through 4 of this Section X in every nonexempt subcontract, and further agrees to take such action as the government may direct as a means of enforcing such requirements.

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

1. Instructions for Certification - Primary Covered Transactions:

(Applicable to all Federal-aid contracts - 49 CFR 29)

- a. By signing and submitting this proposal, the prospective primary 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 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 primary 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 department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.
- d. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if any time the prospective primary 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," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in

obtaining a copy of those regulations.

f. The prospective primary 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 primary 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 Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

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 may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the nonprocurement portion of the "Lists of Parties Excluded From Federal Procurement or Nonprocurement Programs" (Nonprocurement List) which is compiled by the General Services Administration.

i. 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.

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.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Primary Covered Transactions

1. The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

b. Have not within a 3-year period preceding this proposal been convicted of or had a civil judgement 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;

c. 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 1b of this certification; and

d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

2. Where the prospective primary 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 Covered Transactions:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions of \$25,000 or more - 49 CFR 29)

- 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," "primary covered transaction," "participant," "person," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.
- 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.
- 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 may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.
- 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 Covered Transactions:

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 participation in this transaction 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.

* * * * *

XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

(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 his or her bid or proposal that he or she 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.

Form FHWA-1273 (Rev. 3-94)

DIFFERING SITE CONDITIONS,

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

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

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

No contract adjustment which results in a benefit to the contractor will be allowed unless the contractor has

provided the required written notice.

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

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

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

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

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

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

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

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

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

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.

Title 29 Del.C. §6960 relating to wages further stipulates "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", and ... "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."

Bidders are specifically directed to note the Department of Labor's 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

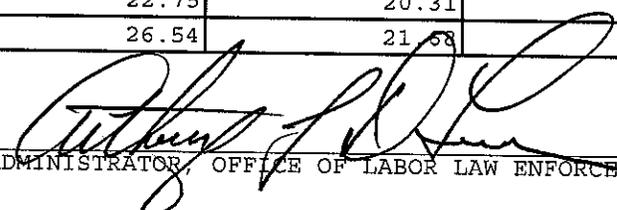
Mailing Address:
225 CORPORATE BOULEVARD
SUITE 104
NEWARK, DE 19702

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

PREVAILING WAGES FOR HIGHWAY CONSTRUCTION EFFECTIVE MARCH 15, 2011

CLASSIFICATION	NEW CASTLE	KENT	SUSSEX
BRICKLAYERS	44.98	44.98	14.51
CARPENTERS	40.86	48.31	38.62
CEMENT FINISHERS	28.11	24.68	23.29
ELECTRICAL LINE WORKERS	22.50	54.05	54.05
ELECTRICIANS	57.10	57.10	57.10
IRON WORKERS	42.20	22.98	25.35
LABORERS	25.44	23.33	24.00
MILLWRIGHTS	16.11	15.63	13.49
PAINTERS	41.42	41.42	41.42
PILEDRIVERS	59.23	23.75	26.95
POWER EQUIPMENT OPERATORS	31.46	26.00	26.31
SHEET METAL WORKERS	22.75	20.31	18.40
TRUCK DRIVERS	26.54	21.58	19.96

CERTIFIED: 4/27/11

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: T201007405.01, BRS 1-687, 1-688, 1-693 South Walnut St, South Market St and Fourth St over Christina River, New Castle County

been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

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

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

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

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

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

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

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

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

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

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

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

END OF GENERAL DECISION

APPLICABILITY OF DAVIS-BACON LABOR STANDARD PROVISIONS TO FLAGGERS

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

* * * * *

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

GUIDELINES

HIGHWAY CONSTRUCTION

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

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

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

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

**SUPPLEMENTAL SPECIFICATIONS
TO THE
AUGUST 2001
STANDARD SPECIFICATIONS**

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

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

To access the Website;

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

The full Website Link is;

http://www.deldot.gov/information/pubs_forms/manuals/standard_specifications/index.shtml

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

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

SPECIAL PROVISIONS

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

MODIFICATIONS TO REQUIRED FEDERAL CONTRACT PROVISIONS

The following modifications to the enclosed REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS (located elsewhere in this document) are effective January 18, 2009. Modifications are shown below. Old language is shown crossed out, new language is shown underlined. The full text is not shown, only portions that were modified.

V. STATEMENTS AND PAYROLLS

2. Payrolls and Payroll Records:

b. The payroll records shall contain the name, ~~social security number,~~ and ~~address~~ an individually identifying number for each employee (e.g., the last four digits of the employee's social security number) of each such employee . . .

c. Each contractor and subcontractor shall furnish, each week in which any contract work is performed, to the SHA resident engineer a payroll of wages paid each of its employees (including apprentices, trainees, and helpers, described in Section IV, paragraphs 4 and 5, and watchmen and guards engaged on work during the preceding weekly payroll period). The payroll submitted shall set out accurately and completely all of the information required to be maintained under ~~paragraph 2b of this Section V. 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).~~ This The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing Office, Washington, D.C. 20402. 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 FHWA, if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit them to the applicant, sponsor, or owner, as the case may be, for transmission to the FHWA the contractor, 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 sponsoring government agency (or the applicant, sponsor, or owner).

d. (1) that the payroll for the payroll period contains the information required to be ~~maintained under paragraph 2b of this Section V~~ provided under Sec. 5.5(a)(3)(i) of Regulations, 29 CFR part 5, the appropriate information is being maintained under Sec. 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

- end -

401502 - ASPHALT CEMENT COST ADJUSTMENT

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

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

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

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

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

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

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

The Asphalt cement cost adjustment will be calculated on grade PG 64-22 asphalt regardless of the actual grade of asphalt used. The Project Asphalt Cement Base Price for the project will be \$648.33 per ton (\$714.67 per metric ton).

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

NOTE

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

601535 – TIMBER SIDEWALK

Description:

This work consists of removal and disposal of the existing asphalt filled grid sidewalk, furnishing, fabrication, and installing timber sidewalk in accordance with notes and details on the Plans and directions from the Engineer.

Materials:

- a.) Ipe wood decking shall be to the nominal dimensions as shown on the plans. The wood shall be of First Export Quality, FIF. Ipe wood shall provide a minimum bending stress of 4100 psi with a minimum Modulus of Elasticity of 3.01×10^6 .
- b.) Preservative Treatment: a clear aqueous wax, end sealer, such as Anchorseal, from U•C Coatings Corp., Mobil-Cer M- By ExxonMobil Oil Company, or an approved equal.
- c.) Fasteners: All fasteners shall be ASTM A325 with hot-dip zinc coating applied, complying with ASTM A 153/153M.. Any fastener connecting aluminum to steel shall be stainless steel ASTM F593 plus appropriate stainless steel nuts and washers.
- d.) Structural steel shall be grade 50, as stated in the general notes. All faying surfaces shall receive a prime coat of paint prior to assembly. Final paint color to match the bridge for all structural steel and project specifications.

Construction Methods:

Remove and dispose of asphalt filled steel grid sidewalk. Install steel supports for wood plank sidewalk panels and install Ipe wood plank sidewalk to the limits indicated.

All bolt holes, in Ipe wood planks shall be pre drilled with a bit of the same diameter of the bolt and all bolts shall be thoroughly checked after the nuts have been tightened.

All end cut of the Ipe wood shall be treated with a clear aqueous wax end sealer, prior to installation. The structural steel supports shall be drilled and painted prior to attaching the Ipe planks.

Method of Measurement:

The quantity of timber sidewalk shall be paid for by the square foot of actual walkway installed as measured along the centerline of the bascule girder.

Basis of Payment:

The quantity of timber sidewalk will be paid for at the contract price per square foot of sidewalk. Price and payment will constitute full compensation for removing and disposing of existing sidewalk, furnishing all materials, including new steel support members, fabricating and installing sidewalk panels and for all labor, equipment, tools and incidentals required to complete the work.

4/5/11

602518 – WATER BASED ACRYLIC CONCRETE SEALER

Description:

This work consists of surface preparation, furnishing all materials, and application of water based 100% acrylic latex concrete sealer to any concrete surface that is above final grade. Water based acrylic concrete sealer can be used to overcoat existing concrete sealed and/or painted surfaces or on new concrete where a silicone acrylic concrete sealer is not cost justified. The work shall be performed as indicated on the Plans, in accordance with these Specifications, and as directed by the Engineer.

Materials:

The concrete sealer shall consist of a pigmented and penetrating acrylic waterproof sealer. The sealer shall be 100 % acrylic. The vinyl-acrylic or styrene-acrylic resins are not allowed in the solution. The materials must be local OTC-VOC compliant.

The material sufficient proven history of durability, performance and satisfy following minimum performance requirement:

Salt Spray (Fog)- ASTM B117	passes 300-hour exposure
Flexibility- ASTM D1737	passes 1” mandrel bend
Impact Resistance- ASTM D2794	passes at 30” pounds direct

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

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

The color of the compound shall be of the contractor’s choosing and as close to the color of the existing concrete as possible. The contractor shall submit the color for approval by DelDOT Environmental Studies (Jon Schmidt 302-760-2282 or jon.schmidt@state.de.us) in consultation with the DE SHPO.

Surface Preparation:

All new concrete surfaces, texturing, saw cutting, grooving, and repointing shall be completed before the surface is prepared for sealer. All concrete that is to be sealed shall be cured for at least 28 days after casting or for the length of time specified in the manufacturer’s instruction, which ever is longer.

Curing compounds are typically in-compatible with water-based sealers and are not recommended for use in their conjunction. If the engineer approves the use of a curing compound, it shall be completely removed prior to the application of the water based sealer with a sand or shot blast, followed by vacuum cleaning in accordance with ASTM D4258 & SSPC-SP-13, unless the curing compound is deemed compatible by the manufacturer’s recommendations.

All loose material, grease, dirt, salt, efflorescence, laitance, and other foreign matter, and all loose material shall be removed in accordance with ASTM D4258.

Construction Methods:

The sealer shall be used as supplied by the manufacturers without thinning or alteration, unless specifically required in the manufacturer’s instruction and verified by Engineer.

The acrylic concrete sealer shall be applied to all exposed concrete surfaces as shown on the plans.

Concrete curing compounds, form release agents, and concrete hardeners may not be compatible with recommended coatings. Check for compatibility by applying a test patch of the recommended coating system, covering at least 22 to 32 square feet.

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

A minimum of two coats shall be applied; all applications shall be performed under dry conditions with application-spread rate as recommended by the manufacturers. The sealer shall be applied within the ambient temperature range as recommended by the manufacturer, when no rain is expected within a minimum of 12 hours following the application, and there are no high winds that would cause an improper application. If rain has preceded the application, the surface shall be allowed to dry at least 24 hours before waterproofing application begins.

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

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

Allow concrete to dry one week before testing adhesion per ASTM D3359. If the coating system is incompatible, surface preparation per methods outlined in ASTM D4259 are required.

Method of Measurement:

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

Basis of Payment:

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

4/7/11

602546 - P.C.C. CONCRETE MASONRY DECK SEALER

Description:

The item shall consist of furnishing all materials, cleaning the concrete surface areas and treating a P.C.C concrete masonry deck with a deep penetrating clear water repellent solution as specifically indicated on the Plans, in accordance with these Specifications, and as directed by the Engineer.

Materials:

The sealer shall consist of a one component clear, deep penetrating Isobutyl alkoxy silane sealer. The sealer shall not alter the color or texture of Portland cement concrete. The product used must be a 40 percent minimum silane solution by weight diluted in a suitable alcohol based solvent, no petroleum distillates are permitted. The materials must be local OTC- VOC compliant.

The contractor shall provide Materials and Research Section one (1) quart sample of the silane solution along with technical sheet, analysis report of materials with batch detail for evaluation and approval

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

The water proofing material must be a flowable, penetrating solution capable of being applied by spray or roller. The applied and cured materials must not form a film or otherwise build up on the surface of the treated surface. The application rate must be minimum 125 sq.ft/gal or as specified by the manufacturer. The materials must pass a chloride screen test using NCHRP 244 series IV (1 application at 125 sq.ft/gal.) min 90%.

The waterproofing material shall be tinted with a fugitive red or other dye to enable the silane solution to be visible on the concrete surface for at least four hours after application. The fugitive dye shall not, however, be visible more than seven days after the application of the waterproofing material.

Surface Preparation:

Prior to the application of the waterproofing material, the concrete surfaces shall be cleaned to remove all traces of dirt, dust, salt, grease, oil, asphalt, laitance, and all other foreign contaminants. Cleaning technique may necessitate high pressure wash (minimum 4000 psi at rate of 4 gallon per minute), light sand blasting, shot blasting or combination of different techniques followed by vacuum cleaning in accordance with ASTM D 4258 & SSPC-SP-13.

Construction Methods:

The waterproofing material shall be used as supplied by the manufacturers without thinning or alteration, unless specifically required in the manufacturer's instruction and verified by Engineer.

In order to verify the recommended amount of waterproofing material being applied, the Engineer at his option may work out an area equal to 125 ft² (3 m²) and measure the amount of material applied through the sprayer. If less than one gallon (one liter) of material is used, the method of application will be adjusted. The yield for each day's application shall be calculated. If the yield for any day exceeds 125 ft² per gallon (3 m² per liter), the entire area for that day (s) shall be recoated with the waterproofing solution at a rate designated by the Engineer, but not to exceed 175 ft² per gallon (4.25 m² per liter). All costs associated with recoating shall be at the expense of the Contractor.

The Contractor shall become aware and follow the Manufacturer's safety precautions of all materials and shall exercise appropriate measures. Equipment used for cleaning and preparing the surface areas and for the application of the waterproofing material shall be subject to approval prior to use.

The Contractor shall closely monitor the surface preparation to avoid any unnecessary surface damage. Surface preparation shall be subject to final approval by the Engineer. Any damage done by the contractor shall be repaired/ replaced at their expenses.

Any repairs to the concrete, such as crack injection or sealing and patching of surfaces, shall be performed before the surface cleaning and before waterproofing application begins.

The waterproofing solution shall only be applied to a cleaned concrete surface. In no case shall there be more than 48 hours between the time the surface is blast cleaned and the application of the penetrating water repellent.

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

Traffic, when applicable shall be kept off the treated surface until the waterproofing solution has been completely absorbed, and the surface is dry in accordance with the manufacturer's recommendations.

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

Method of Measurement:

The quantity of P.C.C. Concrete Masonry Deck Sealer will be measured by the square feet of area treated and accepted.

Basis of Payment:

The quantity of P.C.C. Concrete Masonry Deck Sealer will be paid for at the Contract unit price per square foot (square meter). Price and payment will constitute full compensation for furnishing all materials, surface preparations, application of the waterproofing material, disposal of discarded materials, for all labor, tools, equipment, and all necessary incidentals to complete the work.

2/1/07

602572 - REPAIRING EXISTING P.C.C. STRUCTURES

Description:

This work consists of furnishing all materials, and repairing the existing concrete structure with an approved patch mortar in accordance with notes and details on the Plans, and as directed by the Engineer.

Materials:

The material for the grout shall be MARK 194 PATCH MORTAR manufactured by POLY-CARB, 33095 Bainbridge Road, Cleveland, Ohio 44139, (telephone 1-800-225-5649 or 1-216-248-1223); EMACO R320 CI manufactured by Master Builders, Inc., 23700 Chagrin Boulevard, Cleveland, Ohio 44122 (telephone 1-216-831-5500 or 1-800-227-3350); SIKATOP 123 Plus manufactured by Sika Corporation, P. O. Box 297, Lyndhurst, NJ 07071, telephone 1-201-933-8800; or approved equal.

The patch mortar shall match the color and texture of the existing concrete surface as closely as possible. The Contractor shall submit to the Engineer all technical data relating to the product for approval.

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 lbs. (7 kg) max. for superstructure repair and 30 lbs. (14 kg) max for substructure repairs.

All prepared surfaces shall be cleaned by shot or grit blasting to remove dust, oil, grease, and other contaminants as determined by the Engineer. The surface areas shall be cleaned with water under high pressure and the excess water shall be removed by high air pressure or high-powered vacuum to render a dry surface area prior to the application of the mortar.

The patch mortar shall be applied in lifts of no more than 2" (50 mm) or as recommended by the manufacturer. After the top application of patch mortar, the material shall be hand troweled to obtain a smooth final surface.

The Contractor shall follow the manufacturer's recommendations for surface preparation, mixing of patch mortar, applications, and time limitations. If a conflict exists between these specifications and the manufacturer's recommendations, the latter will prevail.

Method of Measurement:

The quantity of mortar will be measured as the actual pounds (kilograms) of mortar placed and accepted. The pounds (kilograms) of mortar used will be calculated by multiplying the number of powder bags used by the weight of the bag. The liquid component will be considered incidental to the item.

Basis of Payment:

The quantity of mortar will be paid for at the Contract unit price per pound (kilogram). Price and payment shall be full compensation for furnishing all materials, removal and disposal of deteriorated concrete, surface preparation, application, shot or grit blasting and air blasting, for all tools, equipment, labor, and all necessary incidentals to complete the work.

01/17/01

602574 - DECK REPAIR, 1/4" TO 1" DEPTH
602575 - DECK REPAIR, 1" TO 3" DEPTH
602576 - DECK REPAIR, 3" TO < FULL DEPTH
602577 - DECK REPAIR, FULL DEPTH

Description:

This work consists of the patching of deteriorated concrete below the lower limit of deck milling as shown on the Plans. The work shall also include cleaning the existing reinforcing steel of all rust and corrosion.

Materials:

Concrete shall be Class D.

Bonding compound shall conform to ASTM C881. Bonding compound shall be applied to existing surfaces before placing mix for patching.

Epoxy mortar shall consist of sand and epoxy, mixed by volume according to manufacturer's recommendations. The epoxy mortar shall be capable of developing a minimum compressive strength of 6500 psi (45 MPa) in 72 hours.

Equipment:

The equipment used shall be subject to the approval of the Engineer and shall comply with the following:

Mechanical Scarification

1. Sawing equipment capable of sawing concrete to a 1" (25 mm) minimum depth.
2. Power operated mechanical scarifier capable of removing not less than 1 1/4" (32 mm) of the concrete surface.
3. Shot or grit blasting equipment capable of removing rust scale and old concrete from reinforcing bars and of removing small chips of concrete partially loosened by the scarifying or chipping operation.
4. Power-driven Hand Tools for removal of unsound concrete will be permitted with the following restrictions:
 - a. "Jack Hammers" heavier than nominal 30 lbs. (14 kg) class shall not be used.
 - b. "Jack Hammers" or mechanical chipping tools shall not be operated at an angle in excess of 45 degrees measured from the surface of the deck.
 - c. "Chipping Hammers" heavier than nominal 15 lbs. (7 kg) class shall not be used to remove concrete from beneath any reinforcing bar.
5. Hand tools such as hammers and chisels shall be provided for removal of particles of unsound concrete from beneath any reinforcing bar or to achieve the required depth.

Construction Methods:

Before starting deck repairs the Contractor shall submit and have approved his/her plan for protecting and curing the patches. When Contract time constraints do not permit curing times as specified in Section 602, the Contractor's plan shall also detail what methods and/or materials he/she will use to attain the necessary early strength and open it to traffic on a timely manner.

After milling is complete and before any patching is commenced, the Engineer will inspect the entire exposed portion of the deck and indicate the type and extent of repair, if any, that is to be made. Deteriorated

areas of deck shall be removed down to sound concrete. Where patches over 1/4" (6 mm) in depth, measured from the milled surface of the existing bridge deck, are required, the perimeter of the patch shall be chipped down so that a 1/4" (6 mm) minimum depth vertical face from the top of the adjacent scarified deck surface exists.

After completion of removal of deteriorated concrete, if it is necessary to remove rust, oil or other foreign materials detrimental to achieving bond, detergent cleaning followed by shot or grit blasting and air blast or vacuum shall be required as determined by the Engineer.

Spalled concrete, voids and other defects which are located within the proposed concrete overlay area shall then be patched in accordance with the following:

1. For cavities not greater than 1/4" (6 mm) in depth, measured from the milled surface, no special treatment of cavity is required.
2. For cavities 1/4" (6 mm) to 1" (25 mm) in depth, measured from the milled surface, after complete cleaning, the space is to be filled with epoxy grout.
3. For cavities 1" (25 mm) to 3" (75 mm) in depth, measured from the milled surface, Contractor has the option of using (2) above or Class D mix concrete. If (2) above is used, in no case shall a patch be placed in layers exceeding 1 1/2" (38 mm) in depth. For whatever type of patch material used, wire mesh reinforcement shall be placed. Where approved by the Engineer, the mesh may be wired to existing reinforcing without the use of expansion bolts, etc. Patches less than 2 square feet (0.2 square meters) in area do not require any mesh. Contractor may use one or more of any patching material specified, provided that each total depth of a patch is made with only one type of patch material.
4. In areas where the depth of removal of deck material is over 3" (75 mm) in depth, measured from the milled surface, Class D concrete shall be placed up to the top of the milled concrete deck surface.

When the depth of removal of an existing concrete deck spanning over a roadway, waterway, or railroad reaches 1/2 of the existing concrete deck thickness and deeper removal is anticipated, the Contractor shall furnish and erect temporary protective structures under the deck to prevent any falling material from reaching the roadway, waterway, or railroad area below.

All corroded reinforcing bars shall be thoroughly cleaned by shot or grit blasting, with the exception of those that have lost 20% or more of their original dimension. These shall be cut and new bars welded in their place. Dual bars of equivalent or greater section may be used. The Engineer shall be the sole judge as to which bars are in need of repairs. Where the bond between existing concrete and reinforcing steel has been destroyed, or where more than half the diameter of the steel is exposed, the concrete adjacent to the bar shall be removed to a depth that will permit concrete to bond to the entire periphery of the bar so exposed. A minimum of 1" (25 mm) clearance shall be required, except where lower bar mats make this impractical. Care shall be exercised to prevent cutting, stretching, or damaging any exposed reinforcing steel.

Areas from which unsound concrete has been removed should be kept free of slurry produced by additional wet sawing of concrete. Work should be planned so that this slurry will drain away from all open areas. All such slurry shall be removed from prepared areas before overlay is placed.

When the deck is to receive an overlay, the surfaces of patches repaired with epoxy grout shall be shot or grit blasted to assure proper bonding with the overlay.

Method of Measurement:

The quantity of concrete deck repair will be measured as the actual number of square feet (meters) of repairs made at the various depths, complete in place and accepted.

Basis of Payment:

The quantity of concrete deck repair made at the various depths will be paid for at the Contract unit prices per square foot (meter) for the various deck repair items. Price and payment shall constitute full

compensation for removal and disposal of existing materials including damaged reinforcing bars; for furnishing, installing and removing temporary protective structures when needed; for cleaning bar reinforcement; for furnishing and placing Class D concrete, epoxy grout and wire mesh; for preparing the concrete for patching and for all labor, equipment, tools and incidentals necessary to complete the work.

Unless provided for otherwise in this Contract, installation, maintenance, and removal of temporary protective structure will be incidental to this item.

5/2/02

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

602580 - PARTIAL REMOVAL OF PCC MASONRY

Description:

Removal of portion of existing portland cement concrete structure shall consist of removing portions or all of the portland cement concrete curbs, parapets, deck at the joints, concrete beams, diaphragms, abutment backwalls, etc., as specifically indicated on the Plans and as directed by the Engineer.

Construction Methods:

The method of removal employed must meet the approval of the Engineer. The technique chosen must not be detrimental to the remaining structure. Pneumatic hammers, if used, shall not exceed 16 lb (7 kg) unless specified otherwise on the Plans.

During removal operations, the Contractor shall make full provisions for maintenance and protection of vehicular traffic. All removed material shall become the property of the Contractor and shall be removed from the site and disposed of on spoil areas approved by the Engineer.

All bar reinforcement, exposed during the removal of the concrete and intended for re-use in the new construction, shall be thoroughly cleaned of rust and other foreign material by shot or grit blasting to the satisfaction of the Engineer. There shall be no separate payment for such work, and the cost shall be included in the item. After removal of all concrete as required, the remaining concrete surface shall be thoroughly cleaned with oil-free compressed air.

The use of explosives is not permitted.

Method of Measurement:

The quantity of removed existing portland cement concrete will be measured as the number of cubic yards (meters) of concrete removed as directed on the Plans or by the Engineer.

Basis of Payment:

The quantity of removed existing portland cement concrete will be paid for at the Contract unit price per cubic yard (meter). Price and payment shall constitute full compensation for removal and disposal of portions of existing concrete structures as applicable and required above, surface preparation including airblast cleaning, shot or grit blast cleaning of reinforcement bars for protection of traffic if applicable during removal operation, for all labor, equipment, tools, and incidentals necessary to complete the work.

3/14/02

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 thoroughly 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.

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

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tools, equipment, labor, and all necessary incidentals to complete the work.

3/15/02

602612 - ACCESS AND CONTAINMENT FOR BRIDGE REPAIRS

Description:

This work includes providing a temporary access and containment system for repairs to the bridge. The containment system shall prevent debris from falling onto travel lanes, shoulders, pedestrian walkways, bridge embankments and/or the Christina River (including the channel and river embankments) during maintenance and repair activities. Repairs include crack and spall repair in the deck, barriers, abutments, concrete piers and pier caps of bridge. Maintenance activities include sealant application, reinforcing steel replacement when required, corrosion removal from reinforcing steel where required, and other requirements as described in the Project Notes for this contract.

Materials:

Temporary access and containment systems proposed for use shall be submitted to DeIDOT for approval. No repair work on the piers or underside of bridge shall commence until after DeIDOT reviews and approves the Contractor's proposed access and containment systems. Proposed materials for these systems shall be described in detail in submittal to DeIDOT.

Construction Methods:

The temporary containment system must prevent all debris generated by bridge repair and maintenance operations from falling onto all active travel lanes and shoulders or into the channel.

When no longer required, as determined by the Engineer, all materials used for the temporary containment system shall become the property of the Contractor, and shall be the Contractor's responsibility for removal from the site and proper disposal.

Prior to commencing any maintenance/repair operations, the Contractor shall prepare a contaminant system for the capture, containment and collection of waste generated by the work, which includes abrasive blasting residue, spent blasting mediums, rust, paint particles, dust, concrete, and all other materials and waste generated during maintenance/repair activities.

Prior to commencing work the Contractor must submit working drawings of the proposed containment system to the Department for approval. The Department will review the drawings and evaluate the system as to its effect on the loading capacity of the existing structure.

If the proposed containment system places additional loading on the bridge structure, then the Contractor shall be required to submit containment system design drawings to DeIDOT for approval. The design drawing shall include an analysis of the dead, live and wind loads which will be added to the existing structure by the containment system, equipment and materials. 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 affect the structural integrity of the bridge. Permanent attachments or fasteners to the bridge will not be permitted. The working drawings shall identify all containment system components, and shall indicate all rigid framework, work platform and scaffolding. 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.

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

For access and support system for pier repairs, the Contractor shall submit working drawings and calculations stamped by a Professional Engineer registered in the State of Delaware detailing the scaffolding and support systems for approval by DeIDOT prior to commencement of work. When erection of the temporary support system is complete, the Contractor shall submit written certification from a Professional Engineer that the installation has been inspected, and is in conformance with the approved working drawings. When no longer required, as determined by the Engineer, all materials used for the temporary access system shall become the property of the Contractor, and shall be the Contractor's responsibility for removal from site and proper disposal.

Method of Measurement and Basis of Payment:

Payment for temporary access and containment systems shall be made, measured and paid for at the contract Lump Sum price bid for the item 602612 - Access and Containment for Bridge Repairs. Price and payment shall constitute full compensation for all materials, labor, and equipment necessary for installation, operation, removal, disposal, submittals and incidentals to complete the work.

4/11/11

602620 - CRACK SEALING BRIDGE DECKS, APPROACH SLABS, SIDEWALKS, ETC.
602629 - CRACK SEALING BRIDGE DECKS, APPROACH SLABS, SIDEWALKS, ETC.

Description:

This item shall consist of furnishing all materials, cleaning the concrete surface area and treating with crack sealer as specifically indicated on the Plans in accordance with these Specifications, notes on the plans, and as directed by the Engineer.

Materials:

The crack sealer shall be a rapid-curing, moisture insensitive, solvent-free, high molecular weight, low viscosity methacrylate or epoxy based crack healer/penetrating sealer.

Each shipment of crack sealer shall be accompanied by Materials Safety Data Sheet and a Certification of Compliance that states that the material conforms to the requirements of these Specifications.

Construction Methods:

The Contractor shall become aware and follow the Manufacturer's safety precautions of all materials and shall exercise appropriate measures. Equipment used for cleaning and preparing the surface areas and for the application of the crack sealer shall be subject to approval prior to their use.

Prior to the application of the crack sealing material, the concrete surfaces shall be cleaned in accordance with the Manufacturer's recommendations. Generally, this will involve removal of all traces of dust, dirt, salt, grease, oil, curing compounds, waxes, asphalt, laitance, and all other foreign contaminants. The substrate shall be clean, sound, and free of surface moisture prior to application. The Contractor shall closely monitor the surface preparation to avoid any unnecessary surface damage. Surface preparation shall be subject to final approval by the Engineer.

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

If excess sealing material is on the surface after the crack sealing treatment has been completed, the area shall be covered with a light broadcast of a dry sand meeting the requirements of Section 804. The amount of sand used shall be sufficient to absorb the excess material. The time of sand broadcast shall be in accordance with the manufacturer's recommendation.

Traffic, when applicable, shall be kept off the treated surface until the crack sealing material has been completely absorbed, and the surface is dry in accordance with the manufacturer's recommendation.

The Contractor shall perform surface preparation and application of the crack sealing material so as not to danger any private and/or public property, endanger pedestrians, workmen and vehicles on the structure, beneath or adjacent to it and marine traffic when applicable.

Method of Measurement:

The quantity of crack sealing under item 602620 will be measured in square feet (meters) of surface area where cracks have been sealed and accepted.

The quantity of crack sealing under item 602629 will be measured in linear feet (meters) of cracks sealed and accepted.

Basis of Payment:

The quantity of crack sealing under item 602620 will be paid for at the Contract unit cost per square foot (meter).

The quantity of crack sealing under item 602629 will be paid for at the Contract unit cost per linear foot (meter).

Price and payment will constitute full compensation for furnishing all materials, surface preparations, application of the crack sealing material and sand, disposal of discarded materials, for all labor, tools, equipment, and all necessary incidentals to complete the work.

3/13/03

602626 - ROUT AND SEAL CRACKS

Description:

This work consists of furnishing of all materials and necessary labor to rout and seal cracks as detailed and located on the plans and in accordance with these specifications.

Materials:

Sealant shall meet or exceed the requirements of ASTM C920 and may or may not require a primer for bonding to concrete. The sealant shall be used only in non-traffic vertical and horizontal applications.

Low or Medium Modulus, Neutral Curing, Silicone Sealant: Where joint sealants in exterior vertical surfaces and non-traffic horizontal surfaces are indicated, provide products complying with the following:

Products: Available products include the following:

- A. 888; Dow Corning.
- B. 795; Dow Corning.
- C. HiFlex 393; NUCO Industries, Inc.
- D. PSI-631 Polymeric Systems, Inc.
- E. SM5731 Poly-Glaze; Schnee-Morehead, Inc.
- F. SM5733 Poly-Glaze; Schnee-Morehead, Inc.
- G. Sectrem 2; Tremco.
- H. Tremsil 600; Tremco.

Type and Grade: S (single component) and NS (nonsag).

Class: 25.

Use Related to Exposure: NT (nontraffic).

Uses Related to Joint Substrates: M, G, and A.

Color: Federal Standard 595 No. 26440

Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealant, free of oily residues or substances capable of staining or harming joint substrate and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants with joint substrates.

Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealant and surfaces adjacent to joints.

Compatibility: Provide joint sealants, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

NOTE: Insure compatibility of joint sealant with "Waterproofing for Portland Cement Concrete Masonry" item where applicable.

Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

Submittals

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Verification: For each type and color of joint sealant required. Install joint sealants in 1/2"

(13 mm) wide joints formed between two 6" (150 mm) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

- C. Product Certificates: Signed by manufacturers of joint sealants certifying that products furnished comply with requirements and are suitable for the use indicated.
- D. SWRI Validation Certificate: For each elastomeric sealant specified to be validated by SWRI's Sealant Validation Program.
- E. Preconstruction Field Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on preconstruction testing specified in "Quality Assurance" section.
- F. Field Test Report Log: For each elastomeric sealant application. Include information specified in "Field Quality Control" section.
- G. Compatibility and Adhesion Test Reports: From sealant manufacturer indicating the following:
 - 1. Materials forming joint substrates and joint-sealant backing have been tested for compatibility and adhesion with joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
- H. Product Test Reports: From a qualified testing agency indicating sealants comply with requirements, based on comprehensive testing of current product formulations.

Quality Assurance

Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

Preconstruction Compatibility and Adhesion Testing: Submit to joint sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.

- 1. Use manufacturer's standard test methods to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - a. Perform test under environmental conditions replicating those that will exist during installation.
- 2. Schedule sufficient time for testing and analyzing results to prevent delaying the work.
- 3. For materials failing tests, obtain joint sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.
- 4. Testing will not be required if joint sealant manufacturers submit joint preparation data that are based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" section from a qualified testing agency based on testing current sealant formulations within a 36-month period.

- 1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021 to conduct the testing indicated, as documented according to ASTM E548.
- 2. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C920, and where applicable, to other standard test methods.
- 3. Test elastomeric joint sealants according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C920 for adhesion and cohesion under cyclic movement, adhesion-in peel, and indentation hardness.

Preconstruction Field Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to joint substrates as follows:

- 1. Locate test joints where indicated or, if not indicated, as directed by Engineer.
- 2. Conduct field tests for each application indicated below:
 - a. Each type of elastomeric sealant and joint substrate indicated.
- 3. Notify Engineer seven days in advance of dates and times when test joints will be installed.
- 4. Arrange for tests to take place with joint sealant manufacturer's technical representative present.
- 5. Test Method: Test joint sealants by hand-pull method described below:
 - a. Install joint sealants in 60" (1500 mm) long joints using same materials and methods for joint preparation and joint sealant installation required for the completed work. Allow sealant to cure fully before testing.
 - b. Make knife cuts from one side of joint to the other, followed by two cuts approximately 2" (50 mm) long at sides of joint and meeting cross cut at one end. Place a mark 1" (25 mm) from crosscut end of 2" (50 mm) piece.

- c. Use fingers to grasp 2" (50 mm) piece of sealant between crosscut end and 1" (25 mm) mark; pull firmly at a 90-degree angle or more in direction of side cuts while holding a ruler along side of sealant. Pull sealant out of joint to the distance recommended by sealant manufacturer for testing adhesive capability, but not less than that equaling specified maximum movement capability in extension; hold this position for 10 seconds.
6. Report whether sealant in joint connected to pulled out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
7. Evaluation of Preconstruction Field Adhesion Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

Mockups: Before installing joint sealants, apply elastomeric sealants as follows to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution:

1. Joints in mockups of assemblies specified in other Sections that are indicated to receive elastomeric joint sealants, which are specified by reference to this Section.

Delivery, Storage, and Handling

Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.

Store and handle materials in compliance with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

Project Conditions

Environmental Limitations: Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer.
2. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40°F (4.4°C).
3. When joint substrates are wet.

Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

Construction Methods:

Examine joints indicated to receive sealant, with installer present, for compliance with requirements for joint configuration, profile, and other conditions affecting joint-sealant performance. Proceed with installation only after unsatisfactory conditions have been corrected.

After routing operations are complete and immediately prior to installing joint sealant clean out joints to comply with joint sealant manufacturer's written instructions and the following requirements:

Remove all foreign material from joint substrate that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), oil, grease, waterproofing, water repellants, water, surface dirt, and frost.

Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles from the above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.

NOTE: Routing and sealing of cracks must be coordinated with activities necessary for application of Item 602521 - "Waterproofing Portland Cement Concrete Masonry."

Joint Priming: Prime joint substrates where recommended in writing by the joint sealant manufacturer; based on preconstruction joint sealant substrate tests or prior experience. Apply a primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.

Installation of Joint Sealants

General: Comply with joint sealant manufacturer's written installation instructions for products and applications indicated, unless requirements that are more stringent apply.

Sealant Installation Standard: Comply with recommendations of ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

Install sealants by proven techniques to comply with the following:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses provided for each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealant according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealants from surfaces adjacent to joint.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint configuration per Figure 5A in ASTM C1193, unless otherwise indicated.

Field Quality Control

Field Adhesion Testing: Field test joint sealant adhesion to joint substrates as follows:

1. Extent of Testing: Test completed elastomeric sealant joints as follows:
 - a. Perform 10 tests for the first 1000' (300 m) of joint length.
 - b. Perform one test for each 1000' (300 m) of joint length thereafter.
2. Test Method: Test joint sealants by hand pull method described below:
 - a. Make knife cuts from one side of joint to the other, followed by two cuts approximately 2" (50 mm) long at sides of joint and meeting cross cut at one end. Place a mark 1" (25 mm) from crosscut end of 2" (50 mm) piece.
 - b. Use fingers to grasp 2" (50 mm) piece of sealant between crosscut end and 1" (25 mm) mark; pull firmly at a 90-degree angle or more in direction of side cuts while holding a ruler along side of sealant. Pull sealant out of joint to the distance recommended by sealant manufacturer for testing adhesive capability, but not less than that equaling specified maximum movement capability in extension; hold this position for 10 seconds.
3. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field adhesion test log.
4. Inspect tested joints and report on the following:
 - a. Whether sealants in joints connected to pulled out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field adhesion hand pull test criteria.
 - b. Whether sealants filled joint cavities and are free from voids.
 - c. Whether sealant dimensions and configurations comply with specified requirements.
5. Record test results in a field adhesion test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
Repair sealants pulled from test area by applying new sealants following same procedures used to originally seal joints. Ensure that original sealant surfaces are clean and new sealant contacts original sealant.

6. Evaluation of Field Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements, will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

Cleaning: Clean off excess sealants or sealant smears adjacent to joints as the work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

Protection: Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from the original work.

Method of Measurement:

The quantity of "Rout and Seal Cracks" will be measured as the number of linear feet (linear meters) of "Rout and Seal Cracks" installed and accepted.

Basis of Payment:

The quantity of "Rout and Seal Cracks" will be paid for at the Contract unit price per linear foot (linear meter) of crack that its routed and sealed as indicated and detailed on the plans and in accordance with this special provision. Price and payment will constitute full compensation for furnishing and placing all materials, routing of crack, removal of surplus material, dewatering and lighting as may be required, and all labor, equipment, tools and incidentals required to complete the work.

11/14/02

602646 - SILICONE ACRYLIC CONCRETE SEALER

Description:

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

Materials:

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

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

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

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

The contractor shall submit color samples for approval which match as close as possible to the color of the existing concrete. The contractor shall submit the color for approval by DeIDOT Environmental Studies (Jon Schmidt 302-760-2282 or jon.schmidt@state.de.us) in consultation with the DE SHPO.

Surface Preparation:

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

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

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

Construction Methods:

The sealer shall be used as supplied by the manufacturers without thinning or alteration unless specifically required in the manufacturer's instructions and verified by Engineer.

The silicone acrylic concrete sealer shall be applied to all exposed concrete surfaces as shown on the plans.

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

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

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

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

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

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

Method of Measurement:

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

Basis of Payment:

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

4/11/11

- 605510 - PREFABRICATED EXPANSION JOINT SYSTEM 2"**
- 605511 - PREFABRICATED EXPANSION JOINT SYSTEM 3"**
- 605512 - PREFABRICATED EXPANSION JOINT SYSTEM 4"**
- 605513 - PREFABRICATED EXPANSION JOINT SYSTEM 5"**
- 605647 - PREFABRICATED EXPANSION JOINT SYSTEM 1 1/2"**
- 605730 - PREFABRICATED EXPANSION JOINT SYSTEM, 1"**

Description:

This work consists of furnishing of all materials and necessary labor to fabricate, assemble, construct and install prefabricated compression seal expansion joint systems of the size(s) specified on the Plans, including neoprene compression seal, angles and studs on roadway and/or sidewalks as specified on the Plans, in accordance with these Specifications.

Materials:

Steel members of the types, size and configurations shown on the plans shall conform to AASHTO M 270/M 270M Grade 36 (Grade 250) or Grade 50 (Grade 345) or Grade 50W (Grade 345W), unless specified otherwise on the Plans. All steel of the joint system shall be painted with the 3 coat urethane paint system with a minimum total thickness of 9 mils (225 µm), and all screws shall be stainless steel ASTM A276, Type 304.

The elastomeric material shall be 100% virgin Polychloroprene (Neoprene), and shall meet the requirements of ASTM D2628 modified to omit the recovery test. The compression seal shall have the following physical properties as applicable ASTM tests.

<u>ASTM Standard</u>	<u>Physical Properties</u>	<u>Performance Requirements</u>
D2240 (Modified)	Hardness	60± points, Durometer (Type A)
D412	Tensile Strength Ultimate	200 psi, min.
	Elongation	250%, min.
D395 (Method B)	Compressive Set	40%, max.
	70 hr. @212 degrees F.	
D573	Heat Resistance (over aging)	
	(70 hrs. @212 degrees F.)	
	Change in durometer hardness	0 to +10 pts. max.
	Change in tensile strength	-20%, max.
	Change in ultimate elongation	-20%, max.
D1360	Abrasion Resistance	Index of 200 or greater permissible
D1149	Ozone Resistance 20% strain, 300 pphm in ari, 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:

Installation of the prefabricated expansion joint system, to include compression seal and application of adhesives, shall be in accordance with the manufacturer's written recommendations and instructions and as specified herein. Special tools for insertion of seals shall be provided by the manufacturer as may be

required. The Contractor shall make arrangements for a technical representative of the manufacturer to be available for advice and inspection during construction of compression seals to ensure satisfactory installation. The compression seal shall be furnished in one piece for the full length of the joint.

Welding shall conform to all applicable requirements of AWS D1.5, including qualifications of welders. Shop drawings and welding procedures must be submitted to the Bridge Engineer for approval prior to any fabrication. Welds at mitered joints in steel armor and between studs and armor shall be tested by magnetic particle tests methods by a testing laboratory approved by the State. All welds, fabrication and testing will be visually inspected by the Department or its approved representative. The Contractor shall submit the manufacturer's certification for quality of materials and the result of welding inspection to the Engineer. Mill test reports must be supplied for all steel. Where, in the opinion of the Engineer, welds are defective, they shall be rewelded or repaired in a manner acceptable to the Engineer.

The installation procedure as described here, shall be adhered to unless modified by the Engineer.

The prefabricated sealing system shall be shop assembled as a unit including the neoprene compression seal, and preset prior to shipment, using prestressing bolts and adjustable temporary connections between positioning steel members. The opening of the joint shall be set at the width required for the seal at a temperature of 68°F (20°C).

The prefabricated joint assembly shall be positioned and attached to the structure by anchorages. Width adjustments shall be made at the discretion of the Engineer and manufacturer's representative. All movements due to shrinkage, creep, mid-slab deflections, and other factors shall be considered.

The prefabricated joint shall be set normal to the grade and the deck concrete slab graded to meet flush with the edge of the joint plates.

Before placing the deck slab, the anchorage attached to the existing girders shall be released by loosening the bolts in the slotted anchorage connections. The prestressing bolts and adjustable temporary connections shall remain in place. After the deck slab has cured the width of joint shall be checked and again adjusted if necessary. The released anchorage shall be tightened, welded and the prestressing bolts and temporary connections removed. The backwall or deck on this side of the joint may then be poured after sealing the openings left by removal of prestressing bolts.

Method of Measurement:

The quantity of the specified size(s) prefabricated expansion joint system will be measured as the actual number of the linear feet furnished and installed, measured along the centerlines of the slab joints.

Basis of Payment:

The quantity of prefabricated expansion joint system will be paid for at the Contract price per linear foot. Price and payment will constitute full compensation for fabricating, furnishing, and installing all materials, labor, equipment and all else necessary therefore and incidental thereto.

Payment for erection angles and other components not specifically part of the prefabricated compression seal joint system shall be included in Prefabricated Expansion Joint System.

12/23/10

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 emissions 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 Suspended 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.

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

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

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 $4.5 \mu\text{g}/\text{m}^3$, over a 24-hour period ($90/30 \times 1.5$). 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:

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

ADA = Adjusted Daily Allowance ($\mu\text{g}/\text{m}^3$)
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 $13.5 \mu\text{g}/\text{m}^3$ ($4.5 \mu\text{g}/\text{m}^3 \times 24/8$). Thus, $13.5 \mu\text{g}/\text{m}^3$ 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 productivity and not interfere 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 hygienist on the job site during lead paint removal activities to insure required hygiene 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
- .02 Definitions
- .03 Permissible Exposure Limit (PEL)
- .04 Initial Determination and Exposure Monitoring
- .05 Methods of Compliance
- .06 Respiratory Protection
- .07 Protective Work Clothing and Equipment
- .08 Housekeeping
- .09 Hygiene Facilities and Practices
- .10 Medical Surveillance Program
- .11 Medical Examinations and Consultations
- .12 Medical Removal Protection
- .13 Employee Information and Training
- .14 Signs
- .15 Recordkeeping
- .16 Observation of Monitoring

.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 be 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 continuous 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.

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

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

³A 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 erythrocyte protoporphyrin (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 or 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 erythrocyte 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 from 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 employee 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.

- 605570 - JOINT REPAIR, (COMPRESSION SEAL), 2"**
- 605571 - JOINT REPAIR, (COMPRESSION SEAL), 3"**
- 605572 - JOINT REPAIR, (COMPRESSION SEAL), 4"**
- 605623 - JOINT REPAIR, (COMPRESSION SEAL), 1 3/4"**
- 605630 - JOINT REPAIR (COMPRESSION SEAL), 2 1/2"**
- 605631 - JOINT REPAIR (COMPRESSION SEAL), 1 1/2"**
- 605632 - JOINT REPAIR (COMPRESSION SEAL), 3/4"**
- 605633 - JOINT REPAIR (COMPRESSION SEAL), 3/8"**
- 605641 - JOINT REPAIR, (COMPRESSION SEAL), 1"**
- 605662 - JOINT REPAIR (COMPRESSION SEAL), 5"**

Description:

This work consists of furnishing all materials, cleaning and preparing the existing joints, including removal of the compression seal, and installing new compression seals in accordance with this Special Provisions, notes on the Plans and as directed by the Engineer.

Materials:

The elastomeric material shall be 100% virgin Polychloroprene (Neoprene), and shall meet the requirements of ASTM D2628 modified to omit the recovery test. The compression seal shall have the following physical properties as applicable ASTM tests.

<u>ASTM Standard</u>	<u>Physical Properties</u>	<u>Performance Requirements</u>
D2240 (Modified)	Hardness	60± points, Durometer (Type A)
D412	Tensile Strength Ultimate	200 psi, min.
	Elongation	250%, min.
D395 (Method B)	Compressive Set	40%, max.
	70 hr. @212 degrees F.	
D573	Heat Resistance (over aging)	
	(70 hrs. @212 degrees F.)	
	Change in durometer hardness	0 to +10 pts. max.
	Change in tensile strength	-20%, max.
	Change in ultimate elongation	-20%, max.
D1360	Abrasion Resistance	Index of 200 or greater permissible
D1149	Ozone Resistance 20% strain, 300 pphm in ari, 70h @ 140 degrees F. (wiped) with toluene to remove surface contamination)	No cracks
D471	Oil Swell, ASTM Oil #3, 70h @ 212	45%, max.
D2240	degrees F., Weight change Low Temperature Stiffening, max 7	+15 points Durometer (Type A) days @ 14 degrees F.

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

Construction Methods:

Steel surfaces of the armor and/or angles to receive the compression seal shall be sand-blasted to a near white metal SSPC-10 immediately before the application of the adhesive and installation of the seal.

All welding steel cutting work shall conform to the applicable requirements of Subsection 605.17 of the Standard Specifications.

All concrete surfaces to receive compression seal shall be free from dirt, oil, rust and any other loose

foreign debris which may be detrimental to effective joint sealing. Spalls and cracks shall be repaired with Acme Elastomeric Concrete or Ceva-Crete patch mortar or approved equal 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 of compression seal joints repaired will be measured by the linear foot of the size(s) applicable to this Contract.

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 removal of the existing compression seal, furnishing all materials, surface preparation concrete and/or steel as applicable, spall and crack repair, installation of the seal, for all labor, equipment, tools, all necessary incidentals to complete the work.

03/13/01

605582 - CLEANING BRIDGE SCUPPERS

Description:

This work consists of furnishing proper equipment and cleaning the existing bridge scuppers and downspouts in accordance with the notes and locations on the Plans as directed by the Engineer.

Construction Methods:

The Contractor shall remove sediment, debris, etc., from the box of the scupper and pipe outfalls. Once this blockage has been removed, the Contractor shall rout, if required, and flush downspouts with water under pressure to remove any obstructions and cleanse the system. Routing and flushing equipment shall be industry accepted equipment for this type of cleaning and flushing operation.

Method of Measurement:

The quantity scuppers cleaned will be measured as the actual number of each scupper cleaned and accepted.

Basis of Payment:

The quantity of scuppers cleaned will be paid for at the Contract unit price per each. Price and payment shall constitute full compensation for cleaning, routing and flushing in pipe from scupper to pipe discharge, disposal of removed materials, for all labor, tools, equipment and necessary incidentals to complete the work.

8/28/02

605585 - STEEL STRUCTURE REPAIR

Description:

This work consists of furnishing, fabrication, and erecting all structural steel for the repair of the structure in accordance with notes and details on the Plans, Section 605 and 602 of the Specifications and directions from the Engineer.

Materials:

As indicated on the Plans and Sections 605, 602. and 603

Construction Methods:

As indicated on the Plans and Sections 605, 602 and 603

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, removal of existing concrete, fabricating, and erecting structural steel and for all labor, equipment, tools and incidentals required to complete the work.

NOTE:

A breakout sheet attached to the Proposal lists the structural steel repairs. The Contractor shall fill in a cost for the repair of each structure. The lump sum bid for item 605585 shall be the sum of the cost for all the structures listed. The completed breakout sheet shall be attached to the Bid Proposal. Failure to submit the breakout sheet with the Bid Proposal will result in the Bid Proposal being declared nonresponsive and rejected.

The Department reserves the right to delete from the Contract one or more of the steel structural repairs and the lump sum to be paid will be reduced in accordance with the Contractor's cost listed for that/those repairs. There will be no extra compensation to the Contractor if such deletion is made.

4/5/11

605590 – BASCULE MACHINERY REPAIR

Description:

The Contractor shall provide all required materials and labor to complete the work as indicated on the Contract Drawings and as specified herein.

Existing machinery and associated components to be removed and/or modified are listed in the Contract Drawings. Upon removal, these parts shall be marked or tagged. Painted parts shall be blasted clean and repainted. New bushings, seals and other refurbishing shall be as specified in the Contract Drawings, or herein.

Work shall include the furnishing, installing and adjusting of all bridge machinery, and making final adjustments to assure proper mechanical operation of the bridge.

Span balance shall be performed by the Contractor during all phases of construction on BR 1-687 Walnut Street and BR 1-693 Fourth Street, and includes strain gage balance testing and analysis, balance monitoring throughout construction, and all required weight changes to maintain the balance requirements provided herein. Strain gages shall be installed and data recorded to evaluate the balance condition of each leaf prior to construction and after all construction work on the moveable leaves has been completed. The Contractor shall, at the direction of the Engineer, make necessary weight adjustments, based upon the analysis of the strain gage tests. A final strain gage retest shall be performed after the adjustments are complete to validate the final balance condition of the bridge. The Contractor shall also develop and maintain a spreadsheet that will calculate the balance condition of the movable leaves throughout the duration of the construction phase. These calculations shall be achieved by tracking all items added to, or subtracted from, each leaf and the change in balance condition resulting from such changes.

The following work is to be performed:

BR 1-687, Walnut Street Bridge and BR 1-693, Fourth Street Bridge

Strain Gage Balancing and Maintaining Span Balance

BR 1-687, Walnut Street Bridge

M1. Flush and fill east and west span lock speed reducers with new lubricating oil. Install new oil level sight gauge and hygroscopic breather.

Lubricating oil is to be as specified on the bridge lubrication chart. Sight gauge to be vented oil-level indicator, ½” NPTF male threaded connection, McMaster-Carr part number 1281K84, Grainger part number 1U596, or approved equal. Breather to be Des-Case model DC-VG-1, Beach Aqua Guard BB-AG-8, or approved equal. Piping and fittings shall be stainless steel.

The sight gauge shall be installed in drain port on side of reducer on the toe end of the bascule leaf with sufficient piping and fittings such that the glass window on the gauge is located at the same elevation as the oil check port. The new piping and fittings shall include a drain plug such that the oil may be drained from the reducer without necessitating removal of the sight gauge.

The hygroscopic breather shall be installed in the port on the top of the reducer housing, closer to the toe end of the bascule leaf. Sufficient piping and fittings shall be used to install the breather as close to vertical as possible.

M2. Replace east and west span lock motor supports.

The motor support weldments shall be ASTM A588, high-strength/low-alloy steel. The supports shall be anchored to the existing steel beams with ¾” ASTM A325 high strength bolts. The Contractor shall verify that the span lock motors are fastened to the existing support with turned bolts that have an LC6 fit with the motor feet. The mounting holes in the new support shall be drilled/reamed in the field after final alignment of the motor. If the existing mounting bolts are not turned bolts in fitted holes, new turned bolts shall be used to mount the motors and the motor feet and support shall be reamed for an LC6 fit with the new bolts.

M3. Check all rack gear mounting fasteners on the east and west span lock bars. Replace all loose fasteners with new bolts and lock washers. The bolt size and length shall be field determined. New bolts shall conform to ASTM A325 and be installed with new lock washers.

M4. Replace all shims in span lock guides and receivers. Set clearance according to span lock adjustment procedure shown on contract drawings. Shim material shall be ASTM A167, Type 302/304 stainless steel.

M5. Spot clean and paint corroded components of span lock machinery and supports.

M6. Replace hub seals and cover gaskets on the following couplings:
North Leaf: C1, C2, C3, C4, and C5
South Leaf: C3 and C4

BR 1-693, Fourth Street Bridge

M7. Lubricate forward and rear center guides.

M8. Adjust bearing clearance at south leaf Bearing B2.

M9. Clean and paint the following components:

North Leaf: Shaft S1, Couplings C2 and C4, Shaft and collar between Bearings B5 and B6, and machinery frame mounting bolts for the reduction gearing near the main pinion.

South Leaf: Shaft and collar between Bearings B5 and B6

M10: Remove the smaller cap bolt nuts from Bearings B1 and B2 on both leaves to verify correct size bolt is installed. If bolt is undersized, install correct size bolt.

M11: Install handrail system at rear of counterweight adjacent to machinery.

New Auxiliary Drives:

The new auxiliary span drive at the extended shaft of the main span drive reducer for each leaf (2 total) shall consist of an auxiliary gearmotor with integral brake, a split sprocket, a regular sprocket, a removable roller chain, a sprocket guard, a gearmotor support weldment, support angles, shims and assembly fasteners.

The auxiliary gearmotor shall be a 10 horsepower, 1750 rpm motor and integral helical bevel enclosed gear reducer rated for 8,120 in-lb output torque at 78 rpm with an additional minimum 2.5 service factor. The new gearmotor shall include an integral disc brake and protective canopy end cover. The mounting orientation will be vertical with the bolted connection on the horizontal plane as shown on the plans. The new gearmotors shall be SEW-Eurodrive K87DV132M4-22.4:1 ratio, Nord SK9042.1VX-132M/4BRE100HLRD – 23.89:1 ratio, or approved equal.

The gearmotor is mounted to a new weldment which is bolted to support angles. The support angles shall be bolted to the existing machinery brake support weldment with sufficient clearance for the existing machinery brake mounting bolts. The support angles shall be long enough to allow for sufficient clearance between the auxiliary gearmotor support weldment and the reducer extended input shaft. The gearmotor shall be mounted to the support weldment with 3/4" ASTM A325 bolts.

A split sprocket shall be installed on the main reducer extended input shaft with the existing motor brake wheel coupling key extending 1-1/2" minimum into the split sprocket hub. A solid sprocket shall be keyed to the auxiliary drive gearmotor output shaft. Each sprocket shall be for No. 80 1" pitch chain and be steel, bored and keyed to match components, with 36 teeth. The split sprocket shall be, Martin size S-4 style C, US Tsubaki size S-4 style C, or approved equal. The solid sprocket shall be Martin Type B #80B36, Browning Type B #80B36, or approved equal.

The roller chain shall be standard series single strand 1" pitch. The roller chain shall be Morse No. 80, US Tsubaki RS80-1, or approved equal. The roller chain shall only be installed when the bridge is to be operated by the auxiliary gearmotor. A guard shall be installed at the gearmotor sprocket which must be

removed to install the roller chain. A limit switch shall be tripped when this guard is removed preventing operation of the normal span drive motors. For additional information see Repair Item E5 and Contract Drawing "Fourth (3rd) St. Bridge Mechanical Repair Details – 3".

The Contractor shall supply all apparatus, tools, devices, materials and labor to manufacture, paint, ship, install, erect, align, adjust, lubricate, and test the machinery for the bascule spans included in the repair item list in an approved manner as provided herein. Any apparatus, tools, devices, materials and labor, not specifically stated or included, which may be necessary for the work, shall be furnished by the Contractor. The installation and adjustment of all machinery shall be by millwrights experienced in this class of work.

Submittals:

Submittals shall comply with section 105 of the 2001 DELDOT Standard Specifications and the following:

- A. These Special Provisions depict the general intent of this contract and are not intended to be of sufficient detail to be used in lieu of shop drawings. Additional detail development which may be necessary to satisfy the project requirements and to complete the construction shall be provided by the Contractor at no extra cost, and submitted for the Engineer's review.
- B. The Contractor shall field verify all critical dimensions to ensure dimensional compatibility of all equipment prior to submitting the respective shop drawings, catalog cuts, certified and layout and installation drawings. Manufacturer data shall include but not be limited to installation tolerances and recommendations, maintenance and lubrication recommendations, toleranced interface dimensions for determining fits with other parts, weight, complete model numbers, etc.
- C. Schedules and Procedures. Proposed schedules and procedures shall be submitted to DELDOT for approval prior to commencing work, including the following:
 - 1. Schedule of work with estimated times where normal bridge operations could be interrupted.
 - 2. Proposed traffic control plans necessary for the completion of the repair Work. Traffic controls shall be coordinated with and approved by DELDOT Traffic Control.
 - 3. Proposed testing procedures and schedules of system operation as intended by these Special Provisions.
- D. As-Built Drawings. The Contractor shall maintain on site a full-size set of Working Drawings marked up with changes/revisions in red to reflect the modifications, or as-built or as-installed condition. All such as-built or as-installed drawings shall be turned over to the Engineer at the completion of construction. Final copies of all as-built documentation shall be neat, clean, and easily readable. Drawings shall preferably be updated via CAD, but may be updated by hand where the Engineer agrees that updating via CAD is not practical.
- E. Two suppliers of commercial components are listed. In each instance, the first manufacturer and part number listed was the basis for the design details provided. Minor modifications may be required by the Contractor to utilize the second manufacturer and part number listed. Approved equals may be submitted by the Contractor. It shall be the Contractor's responsibility to prove that any substituted component is equivalent to the components listed herein. Proof of equivalency shall include but not be limited to certified ratings and dimensions, calculations, and protective coating details.

General Requirements:

Coordination. The Contractor shall bear full responsibility for all coordination with the US Coast Guard for all Work in, or over the navigable water, for any construction equipment that will encroach in the navigable channel and/or become obstacle to the marine traffic, and for any delay of marine traffic resulted from his construction. The Contractor shall obtain all required permits and be responsible for any fines or penalties resulting from such Work. The existing bridge operation controls, the existing navigational lighting and traffic signals of the bridge shall be operational at all times during construction.

The existing roadway lighting shall remain fully operable during all hours of darkness throughout the construction. Any interruption of bridge operation and vehicular traffic necessary to perform the Work shall be coordinated and permitted by the Department. Bridge closures to vehicular traffic to perform the Work or system testing by the Contractor within the hours of 6:00 AM to 9:00 AM and 3:00 PM to 7:00 PM of any day of the week are not allowed.

Bridge closures to vehicular traffic are allowed for the remaining hours of the day and shall not be more than 15 minutes, provided that at least 1 hour of bridge opening to vehicular traffic shall be allowed between bridge closures.

Any bridge closure of more than 15 minutes shall be coordinated with and approved by the Department. The Department shall be notified at least 5 days in advance. Procedures of bridge closures to vehicular traffic more than 15 minutes shall be submitted for review and approval by the Department.

Materials:

General. All materials shall be new and conform to the ASTM and other Special Provisions cited herein, as indicated on the drawings, or as may be otherwise applicable.

- A. Brinell hardness tests shall be made, and included on inspection reports, for castings and forgings for which hardness values are required on the drawings, and in the materials Special Provisions, or specified herein.
- B. Steel for miscellaneous weldments and components shall be ASTM A36/A36M unless otherwise specified, and always weldable grades as designated by applicable ASTM standards. Welding materials and methods shall conform to the AWS Structural Welding Code AWS D1.1.
- C. No item shall be fabricated, machined, welded, cast or forged without sufficient advance notification to the Engineer to permit scheduling of required inspection. The Contractor shall furnish all facilities and provide for the free access at the plant or shop for the inspection of material and workmanship.

Standard Products. Materials and equipment shall be essentially the standard cataloged products of manufacturers regularly engaged in production of such materials or equipment and shall be the manufacturer's latest design that complies with the specification requirements. Materials and equipment shall essentially duplicate items that have been in satisfactory commercial or industrial use at least two years prior to bid opening. Where two units of the same class of equipment are required, these units shall be products of a single manufacturer; however, the component parts of the system need not be the products of the same manufacturer. Each major component of equipment shall have the manufacturer's name and address and the model and serial number on a nameplate, securely affixed in a conspicuous place. The nameplate of the distributing agent will not be acceptable.

Manufacturer's Recommendations. Where installation procedures or any part thereof are required to be in accordance with the recommendation of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished to the Engineer prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

Carbon Steel Plate and Weldments. Carbon steel plate for machinery base weldments, unless otherwise noted on the Contract Drawings: ASTM A572 Grade 50, fine grain practice mandatory. Steel weldments of equal or greater strength and corrosion resistance can be proposed where steel castings are specified, subject to approval by the Engineer.

Electrodes for Welding. Electrodes for welding shall comply with AWS D1.1 Code.

Common Bolts, Nuts and Washers. Heavy hexagonal head structural bolts, heavy hexagonal nuts, and hardened washers complying with respectively ASTM A325, Type 3, ASTM A563, Grade C, and ASTM F436.

High Strength Bolts. High strength, hexagonal head bolts shall conform to ASTM A490, Type 3.

High Strength Turned Bolts. Turned bolts shall be made from material equal to ASTM A325, Type 3.

Anchor Bolts/Nuts. Anchor bolts shall be made from material equal to ASTM A193, Grade B7. The corresponding nuts shall be equal to ASTM A194.

Steel Castings. Steel castings shall be ASTM A148, Grade 80-50, unless otherwise specified. Steel castings of equal or greater strength and corrosion resistance can be proposed where steel weldments are specified, subject to approval by the Engineer.

Rolled Steel. Rolled steel for shafts shall be ASTM A108, Grade 1018, Cold Finished Round, unless otherwise specified. Rolled steel of equal or greater strength, and of equal or better corrosion resistance can be proposed where steel forgings are specified, subject to the approval by the Engineer.

Details and Workmanship:

In general, the machinery shall be finished, assembled, and adjusted in an approved manner and according to best machine-shop practice. The limits of accuracy which are to be observed in machining the work, and the allowances for all metal fits, shall be placed on the Contractor's working drawings. Fits and finishes of machinery parts shall be as called for on the contract drawings or as specified in AASHTO 1988.

Where surface finishes are indicated on the drawings or specified herein, the symbols used or finishes specified are in accordance with ANSI B 46.1 "Surface Texture". Values of roughness height are specified in micro-inches as an arithmetic average deviation from the mean line. Roughness specified is the maximum value, and any smoother finish will be satisfactory. Compliance with specified surface roughness will be determined by trained sense of feel and by visual inspection of the work compared to "Standard Roughness Comparisons" in accordance with the provisions of ANSI B 46.1. Values of roughness width and waviness are not specified, but shall be consistent with the general type of finish specified by the roughness height. Flaws such as scratches, ridges, holes, peaks, cracks or checks which will make the part unsuitable will be cause for rejection.

Where finish is not indicated or specified, the finish shall be that type which is most suitable for the application, and shall be consistent with the class of fit required. Parts of machinery in contact with other machinery parts or with supports shall be machined so as to provide even, true bearing. Surfaces in rotating or sliding contact with other surfaces shall be finished true to dimensions given and highly polished. Surfaces to be machine-finished shall be indicated on shop drawings by symbols which conform to ANSI B 46.1.

So far as practicable, all work shall be laid out to secure proper matching of adjoining unfinished surfaces. Where there is a large discrepancy between adjoining unfinished surfaces, they shall be chipped and ground smooth, or machined, to secure proper alignment. Unfinished surfaces shall be true to the lines and dimensions shown on the shop drawings and shall be chipped or ground free of all projections and rough spots. Depressions or holes not affecting the strength or usefulness of the parts may be filled in a manner approved by the Engineer.

Shims. All machinery shims required for leveling and alignment of equipment shall be stainless steel, ASTM A167 Type 302/304, neatly trimmed to the dimensions of the assembled parts and drilled for all bolts that pass through the shims. Total shim thickness available shall be no less than equal to twice the nominal thickness shown on the drawings, and sufficient varying thicknesses shall be furnished to secure 0.003-inch variations of the shim allowance including one shim equal to the full allowance. Shims shall be placed to provide full contact between machinery and machinery supports. Shims shall be shown in detail on the shop drawings.

Turned Bolts. The body of the turned bolts shall be finished to 63 microinches or better, as defined by AASHTO 1988. Threads for the turned bolts and nuts shall conform to the Unified Thread Standards, coarse thread series, with a Class 2A tolerance for bolts and Class 2B tolerance for nuts, in accordance with ANSI B 1.1 unless otherwise specified. Turned bolts are designated by their nominal thread size. The turned bolt body shall be 1/16th of an inch larger in diameter than the nominal size specified, and shall have an LC6 fit with reamed holes. Bolt head and nut bearing surfaces shall be flat and square with the axis of the bolt holes and shall be spot faced if necessary. Unless otherwise noted, bolt holes in machinery parts required for connecting to supporting steelwork may be sub-drilled (in the shop) smaller than the turned bolt diameter and shall be reamed together with supporting structural steel either during assembly or at erection, after the parts are correctly assembled and aligned. Positive type locking shall be provided. Double nuts are preferred.

Where double nuts are used, heavy hex and jam nuts shall be used. Alternate locking methods shall be submitted to the Engineer for approval.

Welding. Welding required herein or called for on the Contract drawings shall comply with AWS D1.1. Welded steel machinery parts shall be given a stress relief heat treatment prior to machining. The Contractor shall submit a schedule of the proposed stress relief heat treatment to the Engineer for approval. The schedule shall include a description of the part and an explanation of the proposed heat treatment, including the rate of heating, the soaking temperature, the time at the soaking temperature, the rate of cooling, and the temperature at which the part is to be withdrawn from the chamber. Soaking times of less than one hour will not be approved. Welds in all machinery support mounting bracket weldments shall be 100% inspected by non-destructive methods. Acceptance criteria shall be as described in AWS D1.1 for tension welds in bridges.

Handrail Anchor Bolts. Handrail anchor bolts shall have a minimum embedment in the counterweight concrete of 6 ¾" with the spacing and edge distance shown on the plans. The anchor system shall be epoxy type for ¾" threaded anchor rods. The anchor system shall be Hilti Hit-Hy 150 Max, Red Head G5 High Strength Epoxy, or approved equal.

Execution:

Protection for Shipment. All machinery parts shall be cleaned of dirt, chips, grit, and all other injurious material prior to shipping and shall be given a coat of corrosion-inhibiting preservative.

All finished metal surfaces and unpainted metal surfaces that would be damaged by corrosion shall be coated as soon as practicable after finishing with a rust-inhibiting preservative. This coating shall be removed from all surfaces prior to lubrication for operation and from all surfaces prior to painting after erection.

If the anti-rust coating on any machinery part shall become broken or removed accidentally, or otherwise, it shall be restored immediately.

All machinery parts shall be completely protected from weather, dirt, and all other injurious conditions during manufacture, shipment, and while awaiting erection.

All shaft journals that are shipped disassembled from their bearings shall be protected during shipment and before erection by a packing of oil-soaked rags secured in place by burlap and covered with heavy metal thimbles or heavy timber lagging securely attached; an alternate method may be submitted for approval. Every precaution shall be taken to ensure that the bearing surfaces will not be damaged and that all parts shall arrive at their destination in satisfactory condition.

Assembled units shall be mounted on skids or otherwise crated for protection during handling and shipment.

Erection. All parts of machinery shall be erected in accordance with erection marks and match-marks. When the final position of the machinery will change upon application of the full dead load, the final adjustments shall be made after dead load is fully applied. Before final drilling or reaming, all parts shall be adjusted to exact alignment by means of shims furnished for each part. After final alignment and bolting, all parts shall operate smoothly.

Before erection, all finished surfaces which were coated by a rust-inhibiting coating shall have the coating removed with gasoline, benzene, or other approved solvent. While machinery parts are being erected, they shall be covered by a sound tarpaulin or other durable waterproof covering when work on them is interrupted.

Bolt holes in structural steel for connecting machinery with turned bolts shall, in general, be drilled from the solid after final alignment of the machinery. Sufficient erection holes, subdrilled 1/8 to 1/4 of an inch undersize for temporary bolts, may be used for erection and alignment of the machinery. When the machinery is aligned in its final position, full-size holes for the permanent turned bolts shall be subdrilled and reamed; full-size bolts installed; and the temporary bolts removed.

ASTM A449 bolts shall be torqued to the same tension required for ASTM A325 bolts. Torques for other grades of bolts shall be proportioned to their strength and shall be indicated on the erection drawings.

The machinery: motors, reducers, brakes, bolsters, shafting, couplings, racks, gears and pinions, trunnion

bearings, bearing bolsters, and the like shall be erected and adjusted by competent mechanics and millwrights skilled in the type of work involved. They shall be provided with all necessary precision measuring and leveling instruments as may be required. The machinery shall be erected with exactness so the various parts are truly aligned in their proper positions and, when entirely assembled, will operate smoothly without binding or undue looseness of the parts.

Throughout the installation, bolts and nuts shall be adjusted or tightened only with wrenches that fit; tightening with chisels and hammers will not be permitted.

Installation and alignment of all mechanically connected machinery and electrical equipment shall be conducted under supervision of the machinery manufacturer's field engineer. The machinery and all machine-like elements or parts shall be assembled, erected, aligned, and adjusted at the bridge site. The Engineer shall be afforded every opportunity and facility to satisfy himself that the work is being done in accordance with the Contract Drawings, Special Provisions, and acceptable construction practices. Alignment of all machinery is to be rechecked after all connections and drives have been installed and in operation for a minimum of 10 openings/closings.

Strain Gage Balancing. The Contractor is responsible for determining the balance conditions of the moveable leaves by utilizing the strain gage procedure described below. Strain gage balancing on each leaf shall be performed by the Contractor prior to beginning construction, after all construction is completed, and after balance adjustments to the span and/or counterweight have been made.

Two bi-axial strain gage rosettes shall be mounted on the main pinion shaft or as close as practical to the main pinion shaft, configured in such a way as to cancel the effects of bending, so that only torsional strain in each shaft is being measured. Strain in each shaft shall be continuously measured by a data acquisition system. The angle of opening of the bridge shall be simultaneously recorded by the same data acquisition system as the shaft strain.

Prior to performing strain gage measurements, the Contractor shall submit full documentation of the proposed procedure, including instrumentation equipment, strain gage mounting and wiring arrangements, and specific formulas and equations to be utilized for data analysis.

Prior to recording strain, the strain readings shall be zeroed and all static torsional loading shall be relieved from the machinery: all brakes shall be released, and all pinions adjusted such that pinion and rack teeth are not in contact. Feeler gages shall be utilized at each pinion to confirm that teeth are not in contact.

Strain gage measurements shall be taken only on a dry, calm day, with wind loads less than 5 mph, when there is no extraneous equipment, debris, rainwater, ice, snow, or other material on the bridge that would affect the balance of the spans.

Each leaf shall be tested through at least three (3) complete operational cycles and a permanent record of each test shall be maintained.

The Contractor shall submit a report of the results of the balance determination. From the strain data, shaft torque and bridge unbalance, as seen at the tip of the leaves, shall be computed and plotted against the angle of opening from full closed to full open, and from full open to full closed. A plot of raw data strain against the angle of opening shall also be included. Also included in the results presentation shall be a discussion on the peak operating torques as a percentage of the full load motor torque (when they occur and their magnitude) and system friction.

Initial balancing shall establish the existing balance baseline for use in the balance spreadsheet. If the results of the initial balancing determine that the bridge balance is outside of the acceptable balance condition for construction, the Contractor shall coordinate with the Engineer the means and methods to bring the bridge into an acceptable balance prior to the start of construction.

Post-construction balancing shall verify the construction balance spreadsheet and determine the adjustments to be made to obtain an acceptable balance condition. Final balancing shall be performed to verify that an acceptable final balance has been obtained after the adjustments.

If the final balancing results indicate that an acceptable final balance condition has not been obtained after the adjustments have been made, the Contractor shall make additional adjustments and repeat the balance

testing as required until the desired balance conditions have been achieved.

Additional balance weights shall be furnished by the Contractor as required.

The testing and all balance calculations shall be performed by a Professional Engineer licensed to practice in the Delaware. The Contractor shall provide evidence of successful strain gage balancing experience on a minimum of five (5) bascule bridges within the previous three years. A complete test procedure, along with the resume of the Engineer conducting the tests, shall be submitted for approval prior to the initial balancing test.

The test procedure shall include the following:

- Test method
- List of equipment
- Sample calculations
- Report format

After the balance tests have been completed, the Contractor shall submit a formal report signed and sealed by the Professional Engineer who conducted the tests. The report shall include the following:

- Introduction
- Test procedure and Equipment
- Method of analyzing recorded data
- Presentation of results
- Conclusions
- Calculations
- Graphical representation of Span Balance vs. Opening Angle

Maintaining Span Balance. Following the initial strain gage balance determination, the Contractor shall develop and maintain a spreadsheet that will determine, throughout the duration of the construction phase, the effect of all weight changes on the initial balance condition. The bascule spans shall be maintained to be operational throughout the entire Contract as per the acceptable balance criteria listed below. This shall be accomplished by tracking the weight, as well as the lateral and longitudinal center of gravity locations, relative to the trunnion centerline, of all items added to, or subtracted from, each leaf. The spreadsheet will reflect the actual work plan and shall be updated daily. A copy of the spreadsheet shall be submitted to the Engineer for review prior to any work. The working spreadsheet shall be available for review by the Engineer at any time during construction. Weekly summary print-outs shall be submitted to the Engineer during construction. Temporary adjustments will be made to maintain an acceptable balance condition at all times. The Contractor shall provide, install and remove temporary balance materials as needed.

When weight adjustments are necessary to maintain the acceptable balance conditions as described below, weight shall be added to or removed from the counterweight and/or bascule leaves in accordance with the approved calculations. The bridge balance conditions shall be adjusted the same day the construction activities result in any alteration of the bridge balance, and prior to any known openings for waterway traffic. At no time shall any brakes or span locks be released or disengaged, respectively, until bridge balance has been properly restored. Brakes or span locks shall not be used for the sole purpose of maintaining the bridge in the closed position. Instead, proper balance shall be achieved to maintain the bridge in the desired position.

Temporary equipment and tools shall be removed from the bascule spans prior to each bridge opening.

The spreadsheet and all required calculations shall be signed and sealed by a Professional Engineer licensed in the state of Delaware. A copy of the spreadsheet and all calculations shall be submitted to the Engineer for review and approval prior to the initial balance testing. The balance for each leaf shall be maintained to meet the following requirements:

1. During Construction, Bridge Operation Permitted.

The movable leaf must be span heavy in the closed position, with a positive toe reaction between 1,000 lbs and 5,000 lbs with the bridge in the closed position. The center of gravity must be located between -80° and +80° with the span in the closed position.

2. Final Balance Condition of Bridge Following Construction.

The movable leaf must be span heavy in the closed position, with a positive toe reaction between 1,500 lbs and 2,500 lbs with the bridge in the closed position. The center of gravity must be located between +10° and +40° with the span in the closed position.

NOTE: The center of gravity location is measured from the horizontal on the channel side of the trunnion (i.e. an angle of +20° indicates the center of gravity is located on the channel side of the trunnion at an angle of 20° above the horizontal).

Painting. Cleaning and painting of machinery surfaces shall generally conform to the GENERAL REQUIREMENTS for painting and shall be included on the shop drawings. Factory painted machinery items shall be hand tool or solvent cleaned and repainted with the designated paint system for movable and stationary components.

Machinery surfaces shall be given one prime coat in the shop, a second prime coat and one intermediate coat after machinery and equipment have been installed and a final high gloss finish coat after completion of operating tests. Color for the final coat will be Federal Safety Orange ANSI Z 53.1 for all moving parts including shafts, couplings, sides of pinion and rack, gears, and brake wheels. Bearing and lubricated surfaces shall not be painted. Color for the final coat of stationary parts shall conform to Fed. Std. 595B #24449.

Before application of paint in the shop, surfaces which require painting shall be cleaned of all chips, burrs, dirt, rust scale, sand, grease, and other extraneous materials by employing methods such as chipping, grinding, wire brushing, solvents, compressed air, and sandblasting. After cleaning, surfaces requiring paint shall be painted with one prime coat and the other bearing or sliding surfaces will be coated with protective lubricants as required above and approved by the Engineer. Nameplates shall be clean and free of paint.

After the machinery items have been installed in final position on the bridge, all surfaces which require paint shall be cleaned of grease, oil, and loose materials by the use of solvents and compressed air, and all damaged shop prime coated surfaces shall be touched up with the same paint coating. The Contractor shall take special care to avoid painting of machinery bearing and sliding surfaces and to mask and protect from paint all nameplates, legend plates, and escutcheons mounted on machinery.

After completion of the operating tests and acceptance of the machinery, all oil, grease, dirt, and other foreign matter shall again be cleaned from exposed machinery surfaces. The exposed surfaces shall then be given a third field coat, which shall color-code the machinery to identify fixed and moving parts as indicated above.

Paint for the final field coat shall be brush applied and shall be compatible with the previous coat and shall be high-gloss machinery enamel, resistant to weathering and abrasion, conforming to the requirements of the Safety Color Code for Marking Physical Hazards, ANSI Z 53.1. The machinery enamel shall be a tested product equal to Rust-Oleum Federal Safety Coating. The brand and colors shall be submitted to the Engineer for approval. The Contractor shall place a cautionary sign in the Operator's House and at the entrance to the machinery area of each tower which shall explain the color code. Details of the sign including text, dimensions, mounting locations, and materials shall be submitted to the Engineer for approval.

Lubrication. During installation, the Contractor shall lubricate all rotating and sliding parts of the machinery, and fill all gear reducers, pillow block housings and flexible couplings with lubricants indicated on the approved charts. Purge plugs on all components shall be opened during lubrication to assure that fresh lubricant is thoroughly distributed within the component.

After erection is complete, the Contractor shall make a thorough inspection to ensure that all gears are clean and free of obstruction, that all parts are aligned as closely as practicable without actual operation, and that all bolts are properly tightened. All gear housings shall be filled to the proper level, and all rotating and sliding parts shall be supplied with lubricants.

Testing. The Contractor shall be responsible for performing all testing, inspections, and any resulting corrective work to ensure that, after the installation of the new materials and equipment, the entire bridge supporting, driving, and locking systems will properly function as intended and as recorded by the Contractor prior the removals and as modified and required by the plans and Special Provisions.

In addition to the specific tests described herein and in Item 746662 – Repair Bridge Electrical System, the contractor shall perform all additional testing, and make any necessary repairs or adjustments and as otherwise necessary to provide a complete, functional, and reliable installation. All testing, inspections, and demonstrations, and any resulting remedial work, will be deemed solely the responsibility of the Contractor and will not be considered cause for delay or additional payment. Use test procedures and equipment in accordance with manufacturer's recommendations, any other applicable industry standards, and be appropriate for the specific test being performed.

Method of Measurement:

The quantity of bascule machinery repair will not be measured.

Basis of Payment:

This work will be paid for at the contract bid price of lump sum for Item 605590, BASCULE MACHINERY REPAIR. This price shall include all labor, equipment, strain gage balancing, maintaining span balance, and incidentals necessary to satisfactorily complete the work in accordance with the Contract Plans and Special Provisions.

The lump sum bid for item 605590 shall be the sum of the cost for all the structures listed. The completed breakout sheet shall be attached to the Bid Proposal. Failure to submit the breakout sheet with the Bid Proposal will result in the Bid Proposal being declared non-responsive and rejected.

The Department reserves the right to delete from the Contract one or more of the mechanical repairs and the lump sum to be paid will be reduced in accordance with the Contractor's cost listed for that/those repairs. There will be no extra compensation to the Contractor if such deletion is made.

4/5/11

605591 - STEEL OPEN GRID BRIDGE DECK

Description:

This work involves the removal of the existing grid deck where shown on the plans; grinding smooth of all existing welds that attach the grid deck to the stringers/supports; permanently installing the new grid deck, including any necessary shimming; galvanizing the new grid deck; welding skid resistant studs on the new grid deck.

Quality Assurance

Manufacturer of the steel decking shall conform to the following minimum codes and standards:

1. Manufacturer must be a current member of the Bridge Grid Flooring Manufacturers Association. BGFMA shop practices and fabrication tolerances for grid bridge floors shall apply.
2. Manufacturer must have American Institute of Steel Construction (AISC) certification for Simple Steel Bridges.
3. All welding is to meet AWS D1.5 Bridge Welding Code.
4. Manufacturer must have an AWS certified welding inspector present during manufacturing.

Contractor's representative must take field measurements prior to the preparation of shop drawings.

Submittals

Submit shop drawings showing product detail, bridge deck layout, dimensions, joining details including cross section, fastening details, adjacent construction interface, and all other fabrication and installation details for approval, prior to beginning fabrication.

Handling

During all stages of construction, store fabricated grid and materials in a dry, protected, and well ventilated area, blocking grid and materials to maintain any fabrication camber and/or design flatness.

Materials:

The steel grid decking shall be 5" RB 6.2M open steel grid. The decking shall consist of panels fabricated from A709 GR50 steel, in panel widths as shown on the plans.

The steel grid deck shall consist of the following elements:

1. Main bars: 5-3/16" deep, spaced at 6", and weigh 5.3 lbs./ft.
2. Supplemental bars shall be 1" x 1/4" , two between the main bars.
3. Cross bars: 2-1/2" x 1/4" spaced at 4" c/c.
4. 5/16" diameter, 3/8" high studs shall be welded to the panels at the crossing as shown on the plans, prior to galvanizing.
5. End trim bars shall be provided where shown on the plans
6. Steel grid decking shall be galvanized according to DELDOT specifications.

All elements shall be serrated on their top surfaces. Serration pattern shall be at maximum of 1" c/c.

The decking shall be assembled such that the top of all elements are in the same plane. Notching (other than serrations) of the grid deck main beams at supports will not be permitted.

The steel grid decking shall be fabricated in accordance with Bridge Grid Flooring Manufacturer's Association tolerances.

All welding shall use E70XX electrodes. Electrodes shall be compatible with A709 steel.

Installation

Install the steel grid decking in accordance with the drawings, specifications, approved shop drawings, and manufacturer's installation standards.

All welds and areas of galvanizing damaged during the installation of the new grid deck shall be repaired in accordance with the Standard Specifications.

Method of Measurement and Basis of Payment:

Steel Open Grid Bridge Deck shall be measured and paid for at the square foot price bid and shall be full compensation for the removal of the old steel grid deck, grinding of the existing welds, preparing the existing steel to accept the new steel grid deck, installing new skid resistant studs to the new grid deck as shown on the plans, the design, fabrication, installation and galvanizing of the new steel grid floor.

4/5/11

605592 - WELDING REPAIRS

Description:

This work shall consist of rewelding the existing open grid steel deck to the existing steel stringers and floorbeams where loose as directed by the Engineer in accordance with the ANSI/AASHTO/AWS Bridge Welding Code D1.5 (latest version) and Section 605.

Materials:

Use 1/4" fillet welds with E70XX electrodes. Electrodes shall be compatible with the base metals.

Construction Methods:

The Engineer shall examine the deck to stringer welds and will mark the welds to be repaired. The Contractor will then grind away the existing weld to the original metal and will apply a new weld. The new welds connecting the grid deck main bars to the existing supports shall be 1/4" fillet welds 1 1/2" long on each side of the main bars.

Do not weld when surfaces to be welded are moist or exposed to rain, snow, or wind, or when welders are exposed to inclement conditions that will adversely affect the quality of the work.

Do not weld or burn when the temperature is below 0 degrees F. Preheat and maintain the temperature of the metal to at least 70 degrees F. when the temperature of the metal is between 0 degrees F. and 30 degrees F. during welding or burning. Extend the area to be heated 3 inches beyond the weld in all directions.

Remove by application of heat any moisture present at point of weld. Provide windbreaks for protection from direct wind.

Prior to placing the weld, thoroughly clean all portions of new and existing surfaces to receive welds of all foreign matter, including paint film, for a distance of 2 inches from each side of the outside lines of the weld.

The Contractor will inspect each new weld using a non-destructive testing method such as magnetic particle testing. The Contractor shall provide certification to the Engineer that all welds were inspected and do not contain cracks. Welds that show cracking is present will be removed and re-welded as described above.

Method of Measurement:

The linear feet of welds paid for under this section shall be the actual linear feet of welds complete in place and accepted as determined by field measurements taken on and along the completed welds.

Basis of Payment:

The linear feet of welds, measured as provided above shall be paid for at the contract unit price per linear foot bid for Section 605592 Welding Repairs. This price and payment shall constitute full compensation for surface preparation, welding, labor, tools, material, equipment, and incidentals as necessary to complete the work.

4/6/11

605619 - MOISTURE CURED URETHANE PAINT SYSTEM (OVERCOATING)

Description:

The items shall consist of recoating and/or overcoating a portion or the entire existing steel structure as specifically indicated on the Plans.

Material:

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

Primer

Generic Type:	Micaceous Iron Oxide single-component, moisture-cured urethane overcoat primer
Vehicle Type:	Moisture-cured urethane
Volume of Solids:	60% Minimum
Pigment Type:	3.5 lbs/gal. (.42 kg/L) Micaceous Iron Oxide
Zinc /Micaceous Iron Oxide Content in Dry Film by Wt (ASTM D521):	60% Minimum
Coverage:	3 mils (75 µm) DFT minimum
VOC:	Not to exceed 2.8 lbs/gal (.34 kg/L)
Isocyanate Content:	8.7% min. to 10.3% max.
Weight Per Gallon:	Minimum 20 lbs/gal (2.40 kg/L)

Intermediate Coat

Generic Type:	Micaceous Iron Oxide-filled, single-component, moisture cured polyurethane
Vehicle Type:	Moisture-cured polyurethane
Volume Solids:	60% minimum
Solids by Wt.:	82% ± 2.0 min.
Pigment Type:	4.0 lbs/gal. (.48 kg/L) Micaceous Iron Oxide Tinted to distinguish from primer and topcoat
Color:	Tinted to distinguish from primer and topcoat
Coverage:	3 mils (75 µm) DFT minimum
VOC:	Not to exceed 2.8 lbs/gal (.34 kg/L)
Weight Per Gallon:	Minimum 16 lbs/gal (1.92 kg/L)

Topcoat:

Generic Type:	Micaceous Iron Oxide - filled, single-component, moisture-cured, aliphatic polyurethane
Vehicle Type:	Moisture-cured polyurethane
Vehicle Solids:	Minimum not > 50% of weight of solids
Volume Solids:	60% minimum
Solids by Weight:	Minimum 70%
Pigment Type:	3.5 ± 0.5 lbs/gal .42 ± .06 kg/L) Micaceous Iron Oxide
Finish:	Flat (low gloss)
Color:	To be specified in the Plans
Coverage:	3 mils (75 µm) DFT minimum
VOC:	Not to exceed 3.0 lbs/gal (.36 kg/L)
Weight Per Gallon:	Minimum 12 lbs. (1.44 kg)

All M.I.O. (Micaceous Iron Oxide) filled products must conform to ASTM D5532-94 standard, Type I and have a certification of its 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 paint shall be at the Contractor's option, and shall provide contrast with the underlying substrate or previously applied paint. The color of the finish paint shall be as specified in the Contract Plans.

Successive time interval for coating in between prime coat, intermediate coat and finish coat shall be a minimum of four (4) and a maximum of 14 days. If the Contractor fails to complete the painting during the established period, the surface area shall be cleaned at the Contractor's expense if necessary as determined by the Engineer.

The Contractor may use one of the following approved paint systems:

1. Wasser High-Tech Coatings, Kent, WA 98032
 - Primer: Wasser MC-MIO Zinc (spot)[3 Mil (75 µm), DFT]
 - Intermediate: Wasser MC-Miomastic Iron Oxide [3 Mil (75 µm), DFT]
 - Finish: Wasser Ferrox A [3 Mil (75 µm), DFT]
2. Sherwin Williams
 - Primer: Corothane I - Zinc Primer @ 3 mils (75 µm) DFT
 - Intermediate: Corothane I - Mastic @ 3 mils (75 µm) DFT
 - Finish: Corothane I - Ironox A @ 3 mils (75 µm) DFT
3. - approved equal

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. In addition, the Contractor shall submit a one quart sample of each component of the system (primer, intermediate and finish coats) to the DelDOT Materials and Research Section (302) 760-2400) 30 days prior to the start of painting. The samples submitted shall be from the paint to be used on the bridge(s) with the same batch numbers and shall be labeled with the manufacturer's name, product name, compartment part, batch number, date of manufacturer, and the bridge on which it is to be used. The Department will perform testing on the paint submitted.

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

Containers of paint shall be labeled with the manufacturer's name, product name, compartment part, batch number, date of manufacturer 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, unless otherwise noted on the Plans railings, fascia, downspouts, and other miscellaneous steel items that have been previously painted shall be cleaned and primed, and painted two full coats of paint, the intermediate coat and the finish coat.

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

Surfaces specified to be recoated shall be cleaned to bare metal in accordance with SSPC-SP11, Power Tool Cleaning to Bare Metal.

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 using HEPA filtered vacuums.

Surfaces shall be accepted by visual comparison to a project prepared standard. The Contractor shall prepare the project standard by power tool cleaning a representative area on the structure that is being prepared for painting. The prepared standard shall generally conform to SSPC-Vis 3, "Visual Standard for Power and Hand Tool Cleaned Steel", Pictorial Standard E SP11, F SP11, and G SP11, as applicable, and shall be approved by the Engineer before the start of general cleaning work. At least one standard shall be prepared for each structure that is being specified for cleaning. More than one standard may be necessary if the cleaned steel differs significantly from the photographic standards due to surface conditions or other factors. There shall be 1 standard per span of the bridge that is to be cleaned and painted. 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 structure that is accessible to, and approved by the Engineer.

The Contractor shall protect the projects standard from corrosion and contamination throughout the duration of work. Protection shall be by applying a clear coat of polyurethane, or other means. At the completion of cleaning work, the project standard shall be recleaned and painted in accordance with this 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.

The surface areas designated to be overcoated shall be solvent cleaned after water blasting to ensure the original coating is cleaned of heavy grease, bird droppings, and residual paint particles left behind by any power tool cleaning or abrasive blasting.

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 Material Safety Data Sheets for the paint materials being furnished. Instructions, suggestions, and precautions contained in the 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 Steel Structures Painting Council surface preparation specifications, SSPC-SP1, Solvent Cleaning and SSPC-SP11, Power Tool Cleaning to Bare Metal;

One bound copy of the Steel Structures Painting Council pictorial standard, SSPC-Vis 3, Visual Standard for Power and Hand Tool Cleaned Steel;

One bound copy of the Steel Structures Painting Council method SSPC-PA2, Paint Application Specification No. 2 - Measurement of Dry Film Thickness with Magnetic Gages;

One Air Thermometer, pocket type, 1-200°F (17-93°C);

One Surface Thermometer, 0-300°F (17-150°C); and

One Magnetic Dry Film Thickness Gage, Type 2 (fixed probe);

Atmospheric Conditions - Painting shall not be performed unless all 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 painting work to be performed when the surface and ambient temperatures are less than 35°F (2°C) or greater than 100°F (38°C).

No painting is to occur in the winter months between the dates of December 15 to 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 with manufacturer's recommendations and state VOC regulations. Unauthorized use of solvents shall result in recleaning and repainting of 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, unless prohibited by the Contract documents. When spray painting is prohibited, paint shall be applied using brushes or rollers only.

Stripe painting 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 prime coat is applied. All stripe painting will be performed using

a brush only. No other method of paint application 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 or 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 - Areas cleaned to bare metal and specified the item Recoating shall be painted with one coat of primer. After the primer has dried, all surfaces shall be painted with two full coats of paint, the intermediate and the finish coat.

The areas designated for overcoating shall be coated only with a finish coating (or finish coat of the 3 coat system) and shall be compatible with the existing paint system by use of the proper solvent mixtures, when used solely as an overcoat.

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

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 previous coating (primer), or within the manufacturer's recommended schedule for recoating, whichever is less.

The finish paint shall be applied to the receiving surface within 14 days of the application of the previous coating (intermediate), or within the manufacturer's recommended schedule for recoating, 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.

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 (such as "Texaco Type 'L' Grease" or approved equal) 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 providing that the bearing for other areas that are designated to receive the grease have already been cleaned and painted.

Material Storage - Paint in storage shall be protected from damage and maintained between 40°F (4°C) and 85°F (29°C). Paint not used before the expiration shall be immediately removed from the project site.

Painting of Galvanized Steel -

All galvanized surfaces (downspouts, etc.) shall be painted with a moisture cure aluminum paint that is designed to adhere to galvanized steel surfaces. The moisture cure aluminum paint must follow the following requirements:

1 coat system

Generic type:	Aluminum filled aromatic moisture cure urethane
Vehicle type:	Moisture cured aromatic polyurethane
Pigment type:	Minimum 2 lbs/gal (.24 kg/L) non-leafing aluminum
Coverage:	2 mils (50 µm) D.F.T. minimum
VOC:	Not to exceed 3.5 lbs/gal (.42 kg/L)
Weight per gallon:	9.2 lbs/gal (1.10 kg/L)
Solids by volume:	52.0 ± 1.0%
Shelf life:	6 months from date of shipment, in unopen original containers stored at

temperatures below 86°F (30°C).

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 marking 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 end of the structure, on a location designated by the Engineer. The Contractor shall paint the month and year of the existing stenciling after the existing stenciling area is cleaned and painted if so required in case of partial painting of the structure.

Method of Measurement:

The quantity of moisture cured urethane paint system (overcoating) will not be measured.

Basis of Payment:

The quantity of moisture cured urethane paint system (overcoating) will be paid for at the Contract lump sum. 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 the percentage of the structure primed and painted two full coats of paint in accordance with the specification. The percentage shall be computed as the ratio of the length of structure primed to the total length of structure. The percentage of payments to be paid to the Contractor shall be 25%, 50%, 75%, and 100% after the completion of the job.

6/17/03

605636 - CLEAN AND LUBRICATE BRIDGE BEARINGS

Description:

This work consists of cleaning and lubricating existing bridge bearings as indicated on the Plans and as directed by the Engineer.

Materials:

The lubricant for the bearings shall be waterproof, corrosive resistant and capable of being applied as described below.

Construction Methods:

The bearings specified to be lubricated shall be cleaned by high pressure water flushing at 5,000 psi (35 MPa). Debris that remains shall be removed by hand chipping. Bearings shall be allowed sufficient time to dry before lubrication. Lubricant shall be applied at sufficient pressure and rate so that it can cover the contact surface completely. A final film of 1/16" (2 mm) minimum shall be obtained on exposed area of bearings.

Method of Measurement:

The quantity bridge bearings cleaned and lubricated will be measured as the actual number of each cleaned lubricated and accepted.

Basis of Payment:

The quantity of bridge bearings cleaned and lubricated will be paid for at the Contract unit price per each. Price and payment shall constitute full compensation for furnishing and placing all materials, for cleaning, for all labor, equipment, tools and incidentals required to complete the work.

12/18/02

605652 - INFLATABLE EXPANSION JOINT SEAL, 1"
605668 - INFLATABLE EXPANSION JOINT SEAL, 2"
605676 - INFLATABLE EXPANSION JOINT SEAL, 3"
605688 - INFLATABLE EXPANSION JOINT SEAL, 1 1/2"

Description:

The item shall consist of furnishing all materials, cleaning and preparing the existing joints, including removal of the existing joint, and installing new inflatable expansion joint seals in accordance with the details provided, these Special Provisions and as directed by the Engineer.

Materials:

Profile - Polychloroprene (neoprene) elastomer, pre-formed by extrusion and vulcanized into its definitive shape, durometer shore A, which is supplied in several configurations and dimensions, ranging from 1/4" (6 mm) to 4" (100 mm). The profile shall have the following properties:

High temperature recovery, ASTM D2628	85%, 70 hrs. at 212°F (100°C).
Low temperature recovery, ASTM D2628	80%, 22 hrs. at 20°F (-7°C).
Low temperature recovery, ASTM D2628	83%, 72 hrs. at 14°F (-10°C).
Low temperature impact energy up NASA M88441	to 20.3J -297°F (-183°C).
Oil Swell, ASTM-OIL3	LOX-Liquid Oxygen Compatibility-Passed 45% weight change, 70 hrs. at 212°F (100°C).
Ozone resistance, ASTM D1149	Graded 0 (zero), 70 hrs. at 104°F (40°C)., 300 PPCM of O ³
Elongation break, IPT #674.303	at 260% (Traction)
Compression limit, IPT #674.303	at 78% of nominal width
AASHTO HS-2	Meets criteria

The adhesive shall be a double-component, epoxy-based adhesive, which is mixed at the jobsite. It will be applied to clean gap walls and at outside rough walls of the profile. It shall have the following properties:

Double component thixotropic paste	
Tensile strength	4140 psi (28.5 MPa)
Axial compression	8760 psi (60 MPa)
Shore A	+/- 55
Solids hardness	5 MOHS
Pot life	40 minutes at 68°F (20°C).
Flash point	Greater than 200°F (93°C).
Curing time/Strong bond within 24 hours	
Complete cure	7 days at 68°F (20°C).
(at higher ambient temperatures, the cure will be accelerated.)	

Pressurization is done through a valve with a cap system. The profile is pressurized only during installation and curing time of adhesive, to assure complete bonding throughout gap/profile surfaces. Air pressure will bleed itself with time or air valve can be released at any time after 24 hours of installation.

Acceptable manufacturer's are Watson-Bowman & Acme Corporation, 95 Pineview Drive, Amherst, NY 14120, telephone 1-716-691-7566, or D. S. Brown, 300 East Cherry Street, North Baltimore, Ohio 45872, telephone 1-419-257-3561, or an approved equal.

Construction Methods:

Steel surfaces of the armor and/or angles to receive the inflatable expansion joint seal shall be sand-blasted or disc grinded to a near white metal SSPC-10 immediately before the application of the adhesive and installation of the seal.

All welding steel cutting work shall conform to the applicable requirements of Subsection 605.22 of the Standard Specifications.

All concrete surfaces to receive inflatable expansion joint seal shall be free from dirt, oil, rust and any

other loose foreign debris which may be detrimental to effective joint sealing. Spalls and cracks shall be repaired with Acme Elastomeric Concrete, Ceva-Crete patch mortar or approved equal 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 inflatable expansion joint seal. Any contradiction found between these Special Provisions and the manufacturer's recommendation, the latter will prevail. The Contractor shall verify the joint openings and anticipated movement prior to ordering the inflatable expansion joint seal.

The Contractor shall make every reasonable effort to install the inflatable seal in one continuous piece. If splicing of the inflatable seal is unavoidable, the Contractor shall minimize the number of splices and follow the manufacturer's splice details.

To assure the quality of the inflatable joint seal installation, the manufacturer shall have a representative on site at all times during inflatable joint seal installation. The representative shall direct the Contractor to follow all manufacturer installation guidelines, specifications and recommendations to assure the inflatable joint seal is properly installed

Method of Measurement:

The quantity of inflatable expansion joint seal will be measured as the actual number of linear feet of inflatable expansion joint seal installed and accepted.

Basis of Payment:

The quantity of inflatable expansion joint seal will be paid for at the Contract unit price per linear foot of the size(s) applicable to the Contract. Price and payment will constitute full compensation for removal of the existing joint, furnishing all materials, surface preparation concrete and/or steel as applicable, installation of the seal, for all labor, equipment, tools, and all necessary incidentals to complete the work.

4/6/11

605657 - STRIP SEAL EXPANSION JOINT 1 1/2"
605658 - STRIP SEAL EXPANSION JOINT 2"
605659 - STRIP SEAL EXPANSION JOINT 3"
605660 - STRIP SEAL EXPANSION JOINT 4"
605661 - STRIP SEAL EXPANSION JOINT 5"

Description:

This work consists of furnishing of all materials and necessary labor to remove existing strip seal(s), clean the joint(s), and install prefabricated neoprene strip seal(s) of the size(s) specified on the Plans in existing expansion joint system(s) on roadway and/or sidewalk at locations specified on the Plans and in accordance with these specifications.

Materials:

The elastomeric material shall be 100% virgin Polychloroprene (Neoprene). the strip seal shall be an extruded neoprene material meeting the requirements of ASTM D 2628 modified to omit the recovery test. The elastomeric material shall have the following physical properties as determined by applicable ASTM tests:

<u>ASTM STANDARD</u>	<u>PHYSICAL PROPERTIES</u>	<u>PERFORMANCE REQUIREMENTS</u>
D2240 (Modified)	Hardness	60±7 points, Durometer (Type A)
D412	Tensile Strength	2000 psi (14 MPa), min.
D395 (method B)	Ultimate Elongation	250%, min.
D573	Compressive Set 70 hr. @ 212 °F (100° C).	40%, max.
D1630	Compressive Set 212 °F (100° C).	40%, max.
D1149	Abrasion Resistance	Index of 200 or greater Permissible
D471	Oxone Resistance 20% strain 300 pphm in air, 70h @ 140°F (60° C). (wiped) with toluene to remove surface contamination)	No cracks
D2240	Oil Swell, ASTM Oil #3, 70 h @ 212 °F (100° C)., Weight change	45%, max.
D2240	Low Temperature Stiffening max. 7 days @ 14 °F (-10° C).	+15 points Durometer (Type A)

Construction Methods:

Installation of the prefabricated strip seal, and application of adhesives, shall be in accordance with the manufacturer's written recommendations and instructions and as specified herein. Special tools for insertion of seals shall be provided by the manufacturer as may be required. The strip seal shall be furnished in one piece for the full width of the joint.

Method of Measurement:

The quantity of strip seal expansion joint will be measured as the actual number of linear feet (linear meters) of each size furnished and installed, measured along the centerlines of the slab joints.

Basis of Payment:

The quantity of strip seal expansion joint will be paid for at the Contract unit price per linear foot (linear meter) for size. Price and payment will constitute full compensation for furnishing and installing all materials and for all material, labor, equipment, tools and incidentals required to complete the work.

6/26/02

605690 - COATING WARRANTY

Description:

There shall be a special project warranty guaranteeing the performance of the complete coating systems, including surface preparation, materials, and application against failure for a **period of two (2) years from the date of final acceptance.**

The Project Warranty and Guarantee to be submitted shall be signed and attested to by two (2) corporate officers of the Prime Contractor. The Prime Contractor, regardless of which Contractor applies the paint system, will ultimately be responsible for the Warranty and Guarantee. The Contractor shall supply, prior to the start of painting, the name, address, and phone number of the designated contact person for all issues involving the Project Warranty. Joint warranties or guarantees between Contractor/Sub-Contractor or Contractor/Coatings Manufacturer will not be accepted.

Warranty Bond Requirements: The Contractor shall submit to the Department a warranty bond at the final acceptance of project to insure the State of Delaware of performance during the two (2) year Project Warranty and Guarantee period. The warranty bond shall be an amount equal to one hundred percent (100%) of the total Contract quantity paid at the unit prices specified in the bid proposal for all items related to preparation, cleaning, bridge painting, and maintenance of traffic to perform 2 year required warranty work. The amount of the warranty bond does not relieve the Contractor of his/her responsibility to repair all required areas within the warranty period. The bond shall be retained for two (2) years from that date and after a joint meeting between the Engineer and the Contractor to determine ultimate acceptance.

Warranty Evaluation Review: The State of Delaware shall notify the Contractor in writing of any failure of the coating system discovered within the warranty period. This notice shall be in writing and sent by registered mail, or other special delivery service, cost prepaid, return receipt requested, to the Contractor. All such notices when deposited in the mail, or shipped, shall be considered served when deposited.

The Contractor shall respond within 30 days of said notice to acknowledge receipt and to submit a plan of action to complete the repairs.

The Contractor will be given full and complete opportunity, not interfering with the State of Delaware activities, to inspect and test the alleged failure and coatings.

During the month before the end of the warranty period, the Engineer will inspect the bridge thoroughly for failures of the coating system. This semifinal warranty inspection will be performed jointly by the Department and the Contractor with equipment supplied by the Contractor at his/her expense. The inspection equipment shall be OSHA approved, vehicle mounted, and provide access to all areas of the structure. Traffic control and required signing shall be the Contractor's responsibility and at the Contractor's expense during the semifinal warranty inspection. The Contractor's traffic control plan shall be in accordance with the DelDOT traffic control manual and shall be submitted to the Department for approval.

Failure of the Coating System Definition

- 1) Active Corrosion of the substrate equivalent to ASTM D610 or SSPC-VIS 2, rust grade 7(0.3% of the surface) or worse; loss of adhesion from the substrate.
- 2) Cracking, checking, mudcracking, alligatoring, finning, wrinkling, sagging, flaking, intercoat delaminations, running, or peeling determined visually by the Engineer and verified by destruction of coating in disputed areas.
- 3) Sub-film corrosion determined visually by the Engineer and verified by destruction of coating in disputed areas.
- 4) Loss of adhesion greater than or equal to a rating of 2A in ASTM D3359-95a (Standard test Methods for Measuring Adhesion by Tape Test) test method A-X-Cut tape test.
- 5) Erosion of the film at a rate of two (2%) percent of the coating surface of any contiguous area as defined below per year or greater determined by Engineer measuring actual areas of failures.

- 6) Non-uniformity of topcoat color such as patches, streaks, chalking, or patterns discernable from a distance of ten feet (three meters) or greater that cannot be eliminated by washing.

Failure of the coating system shall be considered to have occurred if the sum of the failures described above is greater than two (2) percent of the coating surface of any single contiguous area as defined below. The SSPC "Guide to Vis-2" shall be used as a guide in determining failure.

A contiguous area is defined as:

- 1) Each face (including top flange and top of bottom flange) of each stringer beam in each span; or
- 2) Each bottom of the lower flange in each span; or
- 3) Each diaphragm; or
- 4) Each bearing

Warranty Repair Requirements: The Contractor shall, within 120 days after receipt of written notice, correct any failures in materials and workmanship which develop within the guarantee period. Variations to the 120 day requirement may be granted if the Contractor is impeded by permits, traffic control, weather, construction, or any other State projects not under the Contractor's control. Extensions will be granted as per the Engineer's recommendations. The Contractor must also correct and/or repair any damage to other work or property of the State of Delaware caused by defective materials, equipment or workmanship when performing said warranty repairs. The Engineer will determine the degree of the repair or corrective procedure.

In the event the Engineer determines that there is a coating failure, the Contractor will be obligated under this Warranty and Guarantee to provide labor, materials, and equipment at his /her own expense to repair and/or replace the coating system to the performance requirements of the original Contract. The extent of repair and/or replacement will be determined in a cooperative effort by the Contractor and the Engineer. Maintenance of traffic and access to the failure areas, including railroad permits and coordination, shall be at the Contractor's expense. Overcoated and recoated areas are to overlap a properly performing adjacent coating system. Any fascia girders/beams or areas visible to the public will receive a cosmetic topcoat to promote a uniform color and appearance of the painted structure. This will only occur if a failure or repair create a discontinuity of the visible appearance as determined by the Engineer.

Exclusions to the Warranty and Guarantee:

Excluded from the Warranty and Guarantee are any and all damages that occur after acceptance of the coating system by the Engineer that are not a direct result of normal usage (i.e. collisions, fires, structural failure, acts of God etc.). Exclusions also include any areas agreed to in writing by both the Contractor's representative and the Engineer before the initiation of the project.

The foregoing guarantee and obligations shall not deprive the State of Delaware of any action, right or remedy otherwise available for breach of any of the provisions of the Contract documents. The periods referred to above shall not be construed as a limitation on the time in which the State of Delaware may pursue such other actions, right or remedy.

Method of Measurement & Basis of Payment:

Coating warranty will not be measured. There will be no separate payment for coating warranty. All cost for providing the coating warranty will be considered as incidental to the coating (painting) item(s) on the Contract.

3/14/02

605692 – SILICONE JOINT SEAL

Description:

This work consists of removal and disposal of existing joint materials and furnishing and installing all new joint materials in accordance with this Special Provision, notes and details on the Plans as applicable to the contract and as directed by the Engineer.

Materials:

Sealant:

The material for the two-part silicone sealer shall be DOW CORNING 902 RCS JOINT SEALANT as manufactured by Dow Corning Corporation, P.O. Box 994, Midland, MI 48686-0994 (Telephone 517-496-6000) or ROYSTON FLEX-FLO as manufactured by Royston Laboratories, 128 First Street, Pittsburgh, PA 15238 (Telephone 412-828-1500) or WABO SILICONE SEAL as manufactured by Watson Bowman Acme Corporation, 95 Pineview Drive, Amherst, NY 14228 (Telephone 716-691-7566 or 1-800-677-4922) or approved equal.

Backer Rod:

The backer rod used to maintain sealant depth shall be expanded closed cell polyethylene foam. Paper rope, open cell foam rod or other back-up materials will not be acceptable. The backer rod shall be sized according to the manufacturer's recommendations for the size of the joint to be sealed as measured by the Contractor.

Construction Methods:

After the removal and disposal of the existing joint materials is completed, the joint shall be sand blasted clean to remove all traces of contaminants from the joint faces. Immediately prior to backer rod installation, all joints shall be blown clean with compressed air. The joint must be thoroughly dry and clean. The backer rod may be installed by hand, but a roller device shall be used to insure a consistent, uniform placement at the proper depth below the bridge deck surface.

The installation of the silicone sealant is to be done as soon after cleaning and backer rod placement as reasonably possible to insure the joints are still clean and dry. In the event the joint does become contaminated, damp, or wet, the backer rod shall be removed, the joint cleaned and dried, and a new backer rod installed. The silicone sealant shall be placed according to the manufacturer's recommendations and to the shape and dimensions shown in the plans. Any failure of the sealed joint due to lack of adhesion or cohesion of joint material; improper or unsatisfactory workmanship by the Contractor; or damage by the Contractor's operations or traffic will be cause for rejection. The joint shall be repaired to the Engineer's satisfaction at no additional cost to the Department.

After a joint has been sealed, all excess sealant or other residue on the bridge deck surface shall be removed. Traffic shall not be permitted over sealed joints until the sealant is tack-free and until debris from traffic does not imbed into the sealant.

Method of Measurement:

The quantity of Silicone Joint Seal will be measured in the field by the number of linear feet (meters) placed and accepted.

Basis of Payment:

The quantity of Silicone Joint Seal will be paid for at the Contract unit price per linear foot (meter). Price and payment shall constitute full compensation for furnishing and placing all materials, cleaning and preparing the joint, for all labor, equipment, tools and incidentals necessary to complete the work.

9/9/02

606501 - METAL BRIDGE RAILING

Description:

This work consists of furnishing all materials and hardware conforming to these specifications and as shown on the Plans. All steel tubes, structural shapes, nuts and bolts shall be hot dipped galvanized and painted unless noted otherwise.

Materials:

Steel tubes and splice tubes shall conform to the requirements of ASTM A-500 Grade B and shall be hot-dipped galvanized in accordance with AASHTO M-111, after fabrication.

Steel channel and angle sections shall conform to the requirements of AASHTO M-270 Grade 50 and shall be hot-dipped galvanized in accordance with AASHTO M-111, after fabrication.

Bolts, nuts and washers shall conform to the requirements of AASHTO M-164 and shall be zinc coated in accordance with AASHTO M-232.

All elements of the metal bridge railing system shall be primed and painted with an epoxy coating. Any existing paint coat that is damaged during repair work shall be fully cleaned off with a wire brush and recoated. The prime coat shall be a two component polyamide epoxy coating Series 66 epoxoline primer as manufactured by TNEMEC Company, Inc. or Ply- Tile 520 Epoxy Coating as manufactured by MAB Paints & Coating or approved equal. The top coat shall be a two component catalyzed aliphatic urethane series 73 Endura-Shield III enamel as manufactured by TNEMEC Company, Inc., or Ply - Thane 800 Coating as manufactured by MAB Paints & Coating or approved equal. The top coat color shall match the existing and the color shall be approved by the Engineer.

Construction Methods:

The existing damaged rail panels shall be fully removed per the details provided in the plans.

Prior to applying coating, all hot-dipped galvanized material shall be thoroughly cleaned in accordance with the Steel Structures Painting Council Standard, SSPC SP-7. All coatings shall be applied by airless or conventional spray. Primer coat thickness shall be 3.0 to 4.0 mils (75 to 100 µm), minimum DFT. Top coat thickness shall be 2.0 to 3.0 mils (50 to 75 µm), minimum DFT. Coatings shall be applied under the following conditions. The minimum temperature of the air, steel and coating shall be 60°F (15°C), humidity 70% maximum and dew point not within 5°F (3°C) of the air temperature.

Fabricator shall handle, pack, and ship, in such a manner as to minimize damage to the finish. The Contractor shall take equal precautions. Suitable touch-up material shall be readily available for the Contractor's use. The Contractor shall supply to the Owner one-half pint (0.25 liter) of touch up material.

All bolts shall be drawn tight. Bolts shall be sufficiently long to extend at least 1/4" (6mm) beyond the nuts, except where required for adjustments, and then bolts shall not extend more than 1/2" (12 mm) beyond nuts. The Contractor shall burr the last thread of all bolts to prevent removal of such bolts.

Method of Measurement:

The quantity of metal bridge railing repaired will be measured as the actual number of linear feet (linear meters) of railing, installed and accepted. Metal bridge railing will be measured by the linear foot (linear meter) from end to end of new rail.

Basis of Payment:

The quantity of metal bridge railing will be paid for at the Contract unit price per linear foot (linear meter). Price and payment will constitute full compensation for furnishing and placing all materials,

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including tubes, structural shapes and all hardware, burring of bolts, for all labor, equipment, tools, and incidentals necessary to complete the item.

4/5/11

606509 - REPAIRING METAL BRIDGE RAILING, ALUMINUM

Description:

This work consists of furnishing all materials, repairing the existing railing posts to remain, placing new rails at the locations indicated on the Plans, and replacing all missing railing and post connectors in accordance with these specifications and as directed by the Engineer.

Materials:

New material for rails shall conform to the requirements of Section 606 and the following:

Aluminum pipe – The pipe railing shall be ASTM B429 standard pipe;

Aluminum posts and clip angles - The aluminum posts and clip angles shall conform to alloy and temper 6061-T6.

Aluminum channels – The aluminum channels shall conform to alloy and temper 6061-T6

Aluminum bolts, nuts and washers - All aluminum bolts and nuts shall conform to alloy and temper 6061-T6. All flat washers shall be ALCAD 2024-T4.

Construction Methods:

Prior to fabrication of new parts, the specified rail sizes of the existing railing shall be verified by field measurement.

The resulting repair shall match the existing railing architecture at other locations of the bridge. The remaining portions of the railing to which the new parts are attached are to be cleaned by an acceptable method upon completion of the repair.

Basis of Payment:

Payment for repairing metal bridge railing will be paid for at the Contract Lump Sum price bid for Item 606509 – Repairing Metal Bridge Railing, Aluminum. Price and payment shall constitute full compensation for furnishing all materials, welding, fabricating and placing rails, repairing and cleaning the existing posts to which the rails will be attached, and for all labor, equipment, tools and incidentals necessary to complete this item of work.

4/5/11

701501 - RESET EXISTING STONE CURB

Description:

This work consists of removing and resetting the existing stone curb and stone gutter, if associated with the curb, in accordance with the details, and notes shown on the Plans, and as directed by the Engineer.

Materials and Construction Methods:

Portland cement concrete for the work shall be Class C, and shall conform to the requirements of Section 812 of the Standard Specifications. Mortar shall conform to the requirements of Section 610.

The existing stone curb shall carefully be removed, cleaned of old mortar and stored for reuse. The Contractor should be aware that all or a portion of the existing stone curb may be set in concrete and that removal of the concrete from the curb is included in this item. Unless directed otherwise by the Engineer, sections of stone curb less than 4' (1.2 m) long shall not be used. Stone curb shall be set at the new or existing location in accordance with the detail shown on the Plans and as directed by the Engineer. In absence of such details on the Plans, the Contractor shall follow the existing patterns in resetting the curb. After resetting the stone curb, it shall be thoroughly cleaned of all spots, concrete, mortar etc. to present a clean surface.

Stone curb damaged during the removal and resetting operation shall be replaced in kind at the Contractor's expense.

Method of Measurement:

The quantity of stone curb reset will be measured as the number of linear feet (linear meters) along the front face of the reset curb.

Basis of Payment:

The quantity of stone curb reset will be paid for at the Contract unit price per linear foot (linear meter). Price and payment will constitute full compensation for furnishing all materials, removing, storing, hauling, and resetting the existing stone curb (and stone gutter if associated with the curb), disposal of surplus materials, for all labor, equipment, tools and incidentals necessary to complete the work. There shall be no separate payment for the removing and resetting of stone gutter, but the cost shall be included in the linear footage (linear meter) of the curb.

4/5/11

701508 - PORTLAND CEMENT CONCRETE MONOLITHIC MEDIAN CURB

Description:

The Contractor shall furnish all labor, materials and equipment necessary for and incidental to the complete installation and operation of the concrete island curb as indicated on the Contract Drawings and in accordance with the specifications.

Materials and Construction Methods:

All materials and construction shall conform to the requirements of the contract drawings and the specifications.

Method of Measurement:

The quantity concrete island curb will be measured on a linear foot basis wherein measurements for calculating the number of linear feet will be made along the face of curb of the median island.

Basis of Payment:

Payment will be made at the contract unit price per linear foot for this item. The price shall include the cost for performing the work specified and furnishing all labor, materials, tools, equipment and incidentals necessary for construction of the concrete island acceptable to the Engineer.

10/10/07

705505 – RESET BRICK AND/OR BLOCK SIDEWALK

Description:

This work consists of furnishing all materials to remove, store and reset existing brick and block sidewalk in accordance with these specifications and in reasonably close conformity with the lines, grades, dimensions, and notes on the Plans and as established by the Engineer.

Materials:

New brick and block, referred to as "pavers" elsewhere in this special provision, shall be of a material, shape, style, size and color that matches the existing pavers

Sample pavers shall be submitted for approval and if requested by the Engineer, 3 x 3 (0.9 m x 0.9 m) sample panels shall be constructed for approval.

The edge restraint system shall be as recommended by the paver manufacturer.

Sand for filling joints shall conform to the requirements of Section 818 - Mortar Sand.

Mortar for bedding shall conform to the requirements of Section 610.

Construction Methods:

The existing pavers shall carefully be removed, cleaned and stored for reuse. Any pavers damaged during the removal process will be replaced at no additional cost.

Install the edge restraint system on the approved base where existing conditions do not provide edge restraint.

Spread a leveling course of bedding mortar 1/2 to 1 inches thick, taking care that moisture is constant and the density is loose until the unit pavers are set and compacted.

Place pavers in patterns as to match the existing pattern. Joint spacing shall match the existing spacing. Do not use damaged pavers with chips, cracks, discolorations, or other defects. Cut pavers with a motor driven masonry wet saw to provide clean, sharp, unchipped edges. Cut pavers to fit pattern specified and to neatly fit adjoining material.

Secure the pavers into the mortar leveling course by tapping exposed face with a rubber mallet. Do not tap the pavers with excessive force that causes the mortar bed to squeeze out between the joints. Be careful not to destroy the paver edges. Once the pavers are secured to the mortar bed, completely remove and clean any mortar from the exposed face of the pavers. Pavers shall be installed even and flush to the Engineer's approval.

Spread mortar sand and fill joints immediately after securing the pavers into leveling course. Brush sand until joints are completely filled, then remove excess sand.

Prior to acceptance, any pavers that are chipped, broken, stained, or damaged shall be replaced at the contractor's expense.

Method of Measurement:

The quantity of brick and/or block paving will be measured as the number of square feet of sidewalk completed in-place and accepted.

Basis of Payment:

The quantity of brick and/or block paving will be paid for at the Contract unit price per square foot. Price

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and payment will constitute full compensation for excavation, furnishing and installing brick pavers, restraint system, bedding mortar, and sand for filling joints and for all labor, equipment, tools, and incidentals necessary to complete the work.

4/6/11

720526 - FURNISHING PORTABLE P.C.C. STRUCTURE-MOUNTED SAFETY BARRIER

Description:

The work under this item shall consist of furnishing at the job site(s) Portable P.C.C. Structure-Mounted Safety Barrier, as required by the contract; placing the barrier at locations in accordance with the notes and details of the Plans.

Materials and Construction Methods:

Materials shall conform to the requirements listed on the contract plan and as noted herein.

Portland cement concrete shall have a minimum compressive strength of 4,000 psi, and shall conform to the material requirements of Class A Concrete, Section 812 of the Standard Specifications.

Bar reinforcement shall conform to Section 603 or 604 of the Standard Specifications.

Galvanized anchor bolts, washers and nuts shall conform to ASTM A325.

The barriers shall be constructed in conformity with the applicable requirements of Sections 602, 603 and 604 of the Standard Specifications. Detailed Plans shall be submitted to the Engineer for approval. Design of the concrete, the reinforcement and the anchor bolting system shall meet the requirements of the AASHTO Standard Specifications for Highway Bridges, I, 2.7.1.3.6 and I, 2.7.3.2. The bolting system may be designed to utilize threaded inserts cast into the deck or bolts, with an adhesive anchor system which will provide sufficient strength while permitting the bolt to be unscrewed when no longer in use. The adhesive anchor system shall be the same as or similar to the Kelibond/KeligROUTIN polyester resin system, as manufactured by Kelken-Gold, Inc., South Plainfield, NJ.

Holes in the deck shall be located and drilled in such a manner as to avoid previously placed reinforcement bars. The Contractor shall use an acceptable magnetic locator, such as the James Pachometer Model C-4946 or the Profometer by Proceq or an approved equal to locate the holes and shall be prohibited from using a rotary drill. A percussion-type drill will be acceptable.

Joints between sections of the Portable P.C.C. Structure-Mounted Safety Barriers shall be connected.

Prior to placing the barrier on the construction site at the location(s) shown on the Plans, and as directed, the exposed surfaces of the barriers shall be painted with acceptable exterior white latex acrylic paint.

Workmen or equipment movements shall not be allowed to traverse between the barricaded areas, and the travel lanes, except as approved by the Engineer; and then only with an adequate number of flagmen to safeguard workmen and traffic, in advance of, and at the point where the barricade is opened.

Warning lights, reflectors, and other traffic protective devices shall be placed in accordance with the manual "Delaware Traffic Controls for Street and Highway Construction and Maintenance Utility and Emergency Operations", (latest edition with all revisions till the date of advertisement). Payment for these traffic protective devices shall be made under the applicable bid items elsewhere in the proposal.

Following the removal of the safety barrier after its use, the bolt holes in the bridge deck shall be filled with repair mortar.

Repair mortar shall be one of the following products, or an approved equal:

1. Gold Label, Standard, as manufactured by:
Preco Industries, Limited
Skyline Drive
Plainview, New York 11803
2. Sikaset Mortar (544), as manufactured by:

Sika Corporation
P.O. Box 297
Lyndhurst, New Jersey 07071

3. Set Vertipatch, as manufactured by:

Master Builders
Cleveland, Ohio 44122

Basis of Payment:

The payment for the item as required by the contract shall be made at the unit price per Linear Foot bid for "Furnishing Portable P.C.C. Structure-Mounted Safety Barrier", which price and payment shall constitute full compensation for furnishing all required materials, constructing the barrier, placing, maintaining, painting, removing, repairing the bolt holes, transporting and storing, as directed, for all labor, equipment, tools, and incidentals necessary to complete the work.

720532 - INSTALL PORTABLE IMPACT ATTENUATOR
720534 - FURNISH PORTABLE IMPACT ATTENUATOR
720539 - RELOCATE PORTABLE IMPACT ATTENUATOR

Description:

Work under these items shall consist of furnishing, installing, maintaining, repairing, and relocating portable impact attenuators under the proper item(s) as required to protect the various construction work zones in accordance with these specifications and/or as directed by the engineer in the field.

Materials:

The impact attenuator shall be an energy-absorbing, non-gating, redirectional device meeting the requirements of the NCHRP Report 350, Test Level 3. The configuration of the device shall be as specified (in published literature) by the manufacturer for the design speed indicated on the Plans. Dimensional requirements, if any, shall be as noted on the Plans.

No system that requires removal from site for repairs shall be accepted.

Subject to compliance with requirements, provide one of the following:

1. QuadGuard CZ, 6 Bay, 24" wide unit manufactured by Energy Absorption Systems, Inc.
2. TAU-II manufactured by Barrier Systems Inc.
3. TRACC manufactured by Trinity Highway Products, LLC.

Construction Methods:

Installation of the attenuator system shall be accomplished by experienced workmen in accordance with the manufacturer's recommendations. The Contractor shall provide written certification that the impact attenuator has been properly installed. Such certification shall be to insure that the attenuator system device is crash-worthy according to the manufacturer's current specifications. Certification must be provided within 24 hours of the installation of the attenuator system.

Each attenuator system must be re-inspected and recertified after relocation.

The Contractor shall furnish (720534), install (720532) and relocate (720539) the attenuator system in project locations in accordance with these specifications and/or as directed by the Engineer in the field. Additionally, the Contractor shall furnish (720534) two complete replacement (stand-by) attenuator systems and store on site. If an installed attenuator is damaged, requiring replacement, the Contractor shall remove the damaged attenuator, install (720532) the replacement (stand-by) attenuator, and re-order a replacement (stand-by) attenuator system to be furnished to the project site (720534). If additional replacement (stand-by) attenuator systems are required on this contract, the procedure for payment outlined above will continue to be followed.

Relocate Portable Impact Attenuator (720539) shall constitute removal of an undamaged, previously installed attenuator system; any temporary storage, and re-installation relocation of the attenuator system to another location on the site. Installation of a relocated unit will be paid under Item 720532, Install Portable Impact Attenuator System.

The attenuator system shall be repaired or replaced within 24 hours of the time when the Contractor is notified. After repair or replacement is completed as described above, re-inspection and recertification is required. The Contractor shall provide a 24-hour emergency contact, specifically for the repair or replacement of the attenuator system.

When no longer needed on the contract, any undamaged attenuator system(s) and the stand-by system shall become the property of the Contractor. Damaged attenuators will become the property of the Contractor.

Basis of Payment:

The payment for this item as required by the contract shall be made for the actual number of “Furnish Portable Impact Attenuator” furnished at the unit price bid per each, the actual number of “Install Portable Impact Attenuator” installed at the unit price bid per each, and the actual number of relocations performed under the item “Relocate Portable Impact Attenuator”, as required and approved by the Engineer at the unit price bid per each relocation. The prices under these items shall constitute full compensation for furnishing, installing, maintaining, relocating, delivery to the site, removal from the site, all labor, equipment, tools, and incidentals necessary to complete the work. When attenuators are damaged by the public and replaced with a stand-by attenuator by the contractor, the replacement will be paid for as one (1) installation.

All maintenance of traffic costs associated with portable impact attenuator replacement or repairs shall be paid for under the unit price bid for the respective maintenance of traffic items. Attenuators damaged by the Contractor shall be repaired or replaced at the Contractor’s expense.

1/19/10

720551 - RELOCATING PORTABLE P.C.C. STRUCTURE-MOUNTED SAFETY BARRIER

Description:

The item shall consist of relocating the P.C.C. Structure Mounted Safety Barrier at locations of the job site as indicated on the Plans and/or as directed by the Engineer.

Construction Methods:

The relocations under this item shall be made once the initial placements of the P.C.C. Structure-Mounted Barriers are completed and accepted under the item 720526 - Furnishing Portable P.C.C. Structure mounted Safety Barrier as applicable to this Contract.

The relocation(s) may be made for temporary storage at job site for later use or relocation(s) required by the Plans and/or as directed by the Engineer at the construction sites. The vertical surfaces of the barriers to be exposed to the moving relocation. Also, the barriers to be exposed to the moving traffic, shall be painted with white latex paint prior to each relocation. Also, the barriers shall be painted every six-months after relocation if left at the same location and shall be painted before the winter shut-down in the Fall.

Method of Measurement and Basis of Payment:

The measurement for the item shall be made as the number of linear feet and the payment shall be made for at the Contract unit price per Linear Foot bid for item "720551 - RELOCATING PORTABLE P.C.C. STRUCTURE-MOUNTED SAFETY BARRIER", which price and payment shall constitute full compensation for relocating the barriers, temporary storage at the job site, furnishing paint and painting, maintenance, for all labor, tools, equipment and necessary incidentals to complete the work.

743501 - WARNING LIGHTS, TYPE B
743504 - WARNING SIGNS
743507 - TEMPORARY BARRICADES, TYPE III
743525 - TEMPORARY WARNING SIGNS

Description:

This work consists of furnishing, installing and maintaining these temporary traffic control devices in accordance with the contract documents and with the latest edition of the manual titled "Delaware Manual on Uniform Traffic Control Devices (MUTCD)," hereafter referred to as the "Delaware MUTCD", including all revisions as of the date of the advertisement of this Contract and as directed by the Engineer.

As required under the section entitled "Certification" temporary traffic control 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). In case of conflict between the Delaware MUTCD and the requirements of NCHRP Report 350 and/or MASH, the requirements of NCHRP Report 350 and/or MASH shall govern.

Materials and Construction Methods:

Materials and construction of all signs and barricades shall meet all requirements including retroreflectorization of the Delaware MUTCD.

Unless specified on the Plans, all temporary traffic control devices shall be either new or restored to a satisfactory condition. All reconditioned and/or restored temporary traffic control devices must be approved by the Engineer before their use. Bases of warning signs, when required, shall be weighted with sandbags to resist overturning.

Lane closures necessary for the installation of barricades and the placement of other temporary traffic control devices shall be in accordance with the requirements of the Delaware MUTCD. Type III barricades shall have a minimum width of 4' and shall be placed in accordance with the applicable sections of the Delaware MUTCD. Type B warning lights with yellow lenses shall be placed above all diversion barricades as shown on the plans or as directed by the Engineer. Type B warning lights with red lenses shall be placed above all closure barricades as shown on the plans or as directed by the Engineer. Type B warning lights shall not be used for any other purpose except as described above.

Temporary traffic protection devices shall be suitably maintained at all times. Such maintenance shall include washing sign faces, replacing deficient batteries and lights, aligning lights properly, replacing retroreflective materials, relocating barriers, and any other maintenance of traffic protection devices deemed necessary by the Engineer to maintain traffic in a safe and effective manner.

Warning signs and temporary warning signs shall be retroreflective and shall have rounded corners as per FHWA publication "Standard Highway Signs". Warning signs shall be installed in accordance with the applicable sections of the Delaware MUTCD.

For purposes of measurement and payment the following definitions for signs shall apply:

Warning Signs (Item 743504) are those signs that are generally permanently installed at the beginning of a sustained construction phase (i.e., a construction phase exceeding 24 hours) and/or at the beginning of the project and shall remain in place for the duration of the sustained phase and/or project.

Temporary Warning Signs (Item 743525) are those signs erected for a particular operation or phases of the project that do not exceed 24 hours and may remain in place just during working hours such as "Flagger Ahead" signs.

Any permanent warning signs used on the project shall be securely mounted on break away supports such that the supports are installed in the ground per the sign post manufacturers recommendations. Permanent

warning signs shall not be mounted on portable sign stands except in the following situations:

- Any signs that are placed on a concrete island in the median of a divided highway may be mounted on portable sign stands with proper ballasting material in order to avoid drilling through the concrete to ground mount the sign.
- If a documented utility conflict exists and field adjustments to the sign location cannot be made, the sign may be mounted on a portable sign stand with proper ballasting material. Documentation of the utility conflict shall be provided to the Engineer.

All holes or trenches within paved roadways or sidewalks which could not be practically backfilled and paved prior to restoring the area to traffic, shall be covered by protective covers consisting of temporary steel plates, furnished, installed and secured in place by the Contractor at no extra cost to the Department.

All temporary traffic control work and related items shall either be performed entirely by the Contractor's own organization or totally subcontracted. Maintenance of the equipment shall not be subject to this requirement.

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 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 devices, which includes cones, tubular markers, flexible delineator posts 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 (100 lbs.) or less, include Type III barricades, portable sign supports with signs, and intrusion alarms. Also included are drums, cones, and vertical panels with accessories or attachments.

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 2000, that have not been crash tested in accordance with NCHRP that falls under Category II and III devices.

Method of Measurement:

Temporary Barricades, Type III erected by the Contractor shall be measured in unit of L.F./Day furnished and used as required and approved by the Engineer.

Warning Lights, Type B will be measured in units of Each/Day furnished and used, and approved by the Engineer.

Warning Signs shall be furnished and erected by the Contractor and measurement shall be made per Each for the duration of the sustained phase and/or project. Temporary Warning Signs shall be measured in unit of Each/Day furnished and erected.

Basis of Payment:

The number of temporary barricades measured as described above, shall be paid for at the Contract unit price bid per L.F./Day barricade for the item "Temporary Barricades, Type III" which prices and payments shall be full compensation for providing certification, furnishing, placing, maintaining, and relocating the

barricades as required, all labor, equipment, tools, and all incidentals necessary to complete the work. Barricades stolen or damaged shall be replaced at the Contractor's expense.

The number of each type of warning lights measured as described above shall be paid for at the Contract unit price bid per Each/Day for the item, "Warning Lights, Type B" as required by the Contract, which prices and payments shall be full compensation for providing certification, furnishing, placing, maintaining and relocating the lights, all labor, equipment, tools, and all incidentals necessary to complete the work. Warning lights stolen or damaged shall be replaced at the Contractor's expense.

The number of Warning Signs, measured as described above, shall be paid for at the Contract unit price bid per Each for the item, "Warning Signs", and the Contract unit price bid per Each/Day for "Temporary Warning Signs" which prices and payments shall be full compensation for providing certification, furnishing, placing, maintaining, and relocating warning signs, and any temporary sign supports, hardware, materials and all labor, equipment, tools, and incidentals necessary to complete the work. Signs stolen or damaged shall be replaced at the Contractor's expense.

Payment for traffic control devices shall be based on the Contractor's daily certification, on a Department's form, that the number of temporary traffic control devices are fully operational (i.e., lights working, signs in good legible condition and in their proper position).

03/04/2010

746662 – REPAIR BRIDGE ELECTRICAL SYSTEM

Description:

The Contractor shall provide all required materials, labor and equipment to complete the electrical repairs to the Walnut Street and Fourth Street Bridges over the Christina River, as defined by these Special Provisions and the plans.

The electrical repairs shall include the following work:

BR 1-687, Walnut Street Bridge

- A. Modify the existing traffic gate control circuit to provide control interlocks between the on-coming gates and the off-going gates. Provide new control devices on the existing control console for the new interlocked operation of the traffic gates (repair item E1 as shown on plans).
- B. Modify the span lock limit switch mounting brackets to provide a more precise indication of the lock bar positions for the control of the span locks (repair item E2 as shown on plans).
- C. Add the hand crank covers for the span lock motors. Add limit switches and control interlocks for the safety of the manual operation of the span locks using the hand-cranks (repair item E3 as shown on plans).

BR 1-693, Fourth Street Bridge

- A. Remove the existing generator and transfer switch, and replace with new diesel engine-generator with a sub-base fuel tank, and new automatic transfer switch. Connect new generator and new transfer switch to existing power distribution and control circuit of the bridge (repair item E4 as shown on plans).
- B. Provide new controls for the new auxiliary drive motors. Replace existing hand-released limit switches on all existing motor brakes and machinery brakes to provide interlocked controls of the auxiliary drive motors. Provide new control interlocks to prevent the existing normal drives to back-drive the new auxiliary drive motors when the drive chain of the auxiliary drive motor is attached for operation (repair item E5 as shown on plans).

References:

All electrical repair work shall be performed in conformance with all applicable requirements of UL, NEMA, NFPA, ANSI, ASTM, IEEE, OSHA, and U.S. Coast Guard regulations and standards, and satisfy all applicable NEC and AASHTO requirements. Specifically, the standards, guides, and specifications applicable to this project shall include, but not be limited to, the latest edition of the following:

- 2007 AASHTO LRFD Movable Highway Bridge Design Specifications, 2nd Edition with current Interim
- 2001 Standard Specifications and applicable Additions and Revisions of the Delaware Department of Transportation
- NFPA 70, National electrical Code (NEC)
- ANSI C80.1, Standard for Rigid Steel Conduit, Zinc Coated
- NECA1, Standard Practices for Good Workmanship in Electrical Contracting
- NEMA RN1, Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit
- UL 2200, Stationary Engine Generator Assemblies
- All applicable rules and regulations of the state and local agencies having jurisdiction.

Submittals:

Submittals shall comply with section 105 of the 2001 DELDOT Standard Specifications and the following:

- A. These Special Provisions depict the general intent of this contract and are not intended to be of sufficient detail to be used in lieu of shop drawings and wiring diagrams. Additional detail development which may be necessary to satisfy the project requirements and to complete the construction shall be provided by the Contractor at no extra cost, and submitted for the Engineer's review.
- B. The Contractor shall field verify all critical dimensions to ensure dimensional compatibility of all equipment prior to submitting the respective shop drawings, catalog cuts, and layout and installation drawings.
- C. The Contractor shall field verify the existing control circuits that are to be modified as part of these Special Provisions. Working drawings showing the modifications of the existing control circuits shall be provided to the Engineer for review and approval.
- D. Schedules and Procedures. Proposed schedules and procedures shall be submitted to DELDOT for approval prior to commencing work, including the following:
 - 1. Schedule of work with estimated times where normal bridge operations could be interrupted.
 - 2. Proposed traffic control plans necessary for the completion of the repair Work. Traffic controls shall be coordinated with and approved by DELDOT Traffic Control.
 - 3. Proposed testing procedures and schedules of system operation as intended by these Special Provisions.
- E. As-Built Drawings. The Contractor shall maintain on site a full-size set of Working Drawings marked up with changes/revisions in red to reflect the modifications, or as-built or as-installed condition. All such as-built or as-installed drawings shall be turned over to the Engineer at the completion of construction. Final copies of all as-built documentation shall be neat, clean, and easily readable. Drawings shall preferably be updated via CAD, but may be updated by hand where the Engineer agrees that updating via CAD is not practical.

General Requirements:

Coordination. The Contractor shall bear full responsibility for all coordination with the US Coast Guard for all Work in, or over the navigable water, for any construction equipment that will encroach in the navigable channel and/or become obstacle to the marine traffic, and for any delay of marine traffic resulted from his construction. The Contractor shall obtain all required permits and be responsible for any fines or penalties resulting from such Work.

The existing bridge operation controls, the existing navigational lighting and traffic signals of the bridge shall be operational at all times during construction. The existing roadway lighting shall remain fully operable during all hours of darkness throughout the construction. Any interruption of bridge operation and vehicular traffic necessary to perform the Work shall be coordinated and permitted by the Department.

Bridge closures to vehicular traffic to perform the Work or system testing by the Contractor within the hours of 6:00 AM to 9:00 AM and 3:00 PM to 7:00 PM of any day of the week are not allowed. Bridge closures to vehicular traffic are allowed for the remaining hours of the day and shall not be more than 15 minutes, provided that at least 1 hour of bridge opening to vehicular traffic shall be allowed between bridge closures.

Any bridge closure of more than 15 minutes shall be coordinated with and approved by the Department. The Department shall be notified at least 5 days in advance. Procedures of bridge closures to vehicular traffic more than 15 minutes shall be submitted for review and approval by the Department.

Existing Equipment, Field Measurements and Verification. Before ordering any material or fabricating any item, the Contractor shall verify all pertinent dimensions at the job site and be responsible for their accuracy. He shall also verify all field measurements which are critical to the fabrication of new items, and clearly indicate to differentiate from other dimensions on working drawings which shall be submitted for review and approval.

The Department and the Engineer will not, as a part of shop drawings review, bear responsibility for verification of any field measurements made by the Contractor. Review of shop drawings by the Department and the Engineer does not in any way relieve the Contractor from responsibility for the accuracy of field measurements. The Contractor shall bear full responsibility for any errors which may result from inaccuracy of field measurements.

The Contractor shall carefully and thoroughly investigate and verify the locations and characteristics of all existing equipment, features and facilities, above ground and under ground prior to construction. Any damage to the existing equipment, features, and facilities shall be repaired by the Contractor as directed by the Engineer at no additional cost.

Locations, controls, and wiring of existing equipment as shown on plans are approximate and are based on information and data from existing drawings and field data. The Contractor shall carefully and thoroughly locate, trace, identify, and document all existing equipment, and their wiring that are necessary to perform the Work depicted on plans and herein.

Existing equipment and services that are not specifically shown by the plans as being replaced or modified, are to remain in service throughout the construction. The Contractor shall exercise care to avoid un-necessary disturbances to such equipment and services, and shall obtain approval from the Department for any necessary disturbance. The Contractor shall be responsible for immediate repair of existing equipment that are damaged or disturbed by his construction work at his own expense to the satisfaction of the Engineer.

Qualifications. The Contractor and sub-contractor performing the Work depicted on the plans and stated herein shall be properly qualified, skilled, and experienced in the type of Work required.

Materials:

Diesel Engine-Generator Set. A new diesel engine-generator set shall be provided for the replacement of the existing generator. The diesel engine-generator shall meet the following requirements:

- Conforming to UL 2200, Stationary Engine Generator Assemblies
- Engine certified to US Environmental Protection Agency (EPA) Nonroad Source Emissions Standards, 40 CFR 89, Tier 3
- To accept fully rated load in a single step in accordance with NFPA 110 level 1 systems
- Alternator:
 - 277/480 volts, 3 phase, 60 Hz with reconnectable leads
 - 125 kW/156 kVA Standby Rating, and 113 kW/141 kVA Prime Rating
 - Brushless, 4-pole, revolving field
 - Class H insulation per NEMA MG1
 - Temperature rise of 150 degrees C at 40 degrees C ambient
 - Phase rotation: A, B, C
 - Cooling by direct drive centrifugal blower fan
- Engine:
 - 4-cycle, turbocharged and charge air-cooled
 - Direct injection fuel system, number 2 diesel fuel
 - Single-element, spin-on fuel filter with water separator
 - Integral, high-ambient radiator cooling
 - Rated 1800 RPM
 - Approximate fuel consumption: 7.75 gallons/hours at 100% prime rating
 - Cast iron cylinder block with in-line 6-cylinder configuration
 - Battery capacity 1100 minimum at 0 to 32 degrees F ambient
 - 100 amp battery charging alternator
 - 12 volt, negative ground starting voltage
 - Air cleaner with dry replaceable element
 - Single spin-on, full-flow lubrication oil filter
- Control system equipped with metering and control devices to provide total system integration of the engine-generator set.
- Silencer included with exhaust system. Exhaust pipe and silencer extending beyond the

engine shall be temperature-insulated to prevent inadvertent contact of personnel during engine operation

- Rack-mounted batteries and battery charger
- Main line circuit breaker with rating as shown on plans
- Remote annunciator mounted in control room beside existing control console
- UL listed, dual-wall sub-base fuel tank with approximate capacity of 100 gallons and integral fuel containment basin. Conforming to applicable NFPA 30 - Flammable and Combustible Liquids, NFPA 37 – Standard for Installation and Use of Stationary Combustible Engine and Gas Turbines, and NFPA 110 – Standard for Emergency and Standby Power Systems. Provide all necessary fuel pump, fuel gauges, venting, pressure relief, fuel fill with lockable flip top, and fuel piping
- Spring isolators included with engine-generator set mounting
- Fully interfaced with the new automatic transfer switch for starting/stopping, exercising, and necessary controls
- Manufactured by Cummins, model DSGAB, or Kohler 125REOZJF, or approved equal.

Automatic Transfer Switch. A new automatic transfer switch shall be provided for replacement of the existing transfer switch. The automatic transfer switch shall meet the following requirements:

- A. Shall be UL listed, 4-pole, 400 amps, RMS symmetrical short-circuit rating of 42,000 amps at 480 volts, and shall automatically transfer electrical loads between the 480 volt, 3-phase commercial (primary) power and the standby engine-generator set. Shall transfer to the alternative power source when there is a commercial power source failure or outage.
- B. Shall be provided with double-throw, high-speed quick-make, quick-break contacts, with arc chutes designed to hasten the extinguishing of the arc. The main contacts shall be capable of being replaced without removing the power cables.
- C. The switch transfer operator shall be motorized, utilizing an AC squirrel cage induction motor mounted on a worm gear reducer to drive the spring-loaded overcenter-type transfer linkage. Pivot points in the linkage shall utilize aircraft-type, self-aligning ball joints. The mechanical and electrical interlocking shall be designed so as to positively preclude both power sources from being closed at the same time. The total switch transfer time shall not exceed 30 seconds.
- D. A manual operating linkage shall be so designed as to provide the same contact-to-contact transfer time as the motorized operator. A two-position selector switch shall be provided inside/on the transfer switch cabinet to select of either automatic or manual transfer operation of the switch.
- E. Shall be enclosed in a NEMA 12 enclosure fabricated from 12 gage steel, sized to enclose all necessary accessories, components and devices. The enclosure shall be painted inside and outside with polyester powder coating over the phosphatized surfaces. A welded steel pocket shall be provided on inside of the door for storage of operating and maintenance manuals.
- F. The control system shall be a micro-processor based controller equipped with a control key-pad, and shall be factory-programmed to control all of the operational functions of the automatic transfer switch. LED indicators shall be furnished on the controller to show whether the switch is in the position of the normal or alternate power source. The key-pad controller shall be mounted on the door of the switch with gaskets for the Nema 12 rating of the enclosure.
- G. The controller shall have programmable three-phase over/under voltage sensing, programmable over/under frequency sensing, phase sequence monitoring, and programmable phase differential detection on both normal and alternate power sources. The controller shall be capable of storing the following records in memory for access:
 - 1. Number of hours transfer switch is transferred to the alternate power position (total since record reset)
 - 2. Number of hours alternative power is available (total since reset)
 - 3. Total number of transfer in either direction (total since reset)

4. Date, time, and description of the last four source failures
 5. Date of the last exercise period.
- H. Shall have programmable time delay for transfer to alternate power source with factory preset at 3 seconds, and programmable time delay on retransfer to normal power source with factory preset at 300 seconds.
- I. Shall have a plant exerciser provided with 7 day events, programmable for any day of the week, and calendar events programmable for any month/day, to automatically exercise the generator with exercising period programmable in 1-minute increments. Shall provide all necessary auxiliary contacts and circuit interlock for the exercise of the existing generator equipped with a load bank. Controls shall be provided to engage the generator load bank, when the generator is in an exercise operation.
- J. Shall have a three-phase digital voltmeter to display all separate phase-to-phase voltages simultaneously for the normal and alternate power sources.
- K. Shall close the engine starting contacts when the voltage on any phase of the normal power source drops below 80% or increases above 120%, or frequency drops below 90% or increases above 110%, or 20% voltage differential between phases occurs after a preset time delay of 3 seconds. Shall transfer to alternate power source when the voltage and frequency of the generator have reached 90% to 110% of rated voltage and 95% to 105 % of rated frequency.
- L. Shall be type RMT by Russelectric with model 2000 control, or Thompson Technologies model TS 870 Series, or an approved equal.

Relays. Control relays shall be UL listed NEMA type machine-tool relays. Relay contacts shall be field reversible cartridge type, number of contacts as required, plus one spare contact. Contacts shall be rated at least 10 amperes at 300 volts AC, 60 hertz. Relay coils shall be 120 volts AC, 60 hertz. Control relays shall be Allen-Bradley 700-N, or Cutler Hammer, or approved equal.

Control Switches and Indicator Lights.

- A. Indicator lights, selector switches and push buttons shall be 30.5 mm, NEMA 4/13 type, heavy-duty, water-tight/oil-tight type, of the style as shown in plans. Indicator lights shall be push-to-test, LED and colored lens, with color as shown in plans. As manufactured by Allen-Bradley, Bulletin 800L, or by Cutler Hammer type 10250T, or approved equal. Use 30 mm, transformer type, square indicator light as manufactured by Schneider Electric, type KX 30mm, or by Omron, or an approved equal, for the existing control console of Fourth Street Bridge.
- B. Name plates and device legend plates shall be plastic with white background and engraved black lettering. Name plates which are not part of the panel devices shall be attached with stainless steel or brass screws and nuts. Name plates which are part of the panel devices shall be installed with the devices as recommended by the manufacturer.

Limit Switches. Limit switches shall be lever arm, spring-return, pre-wired, with 2 NO and 2 NC contacts (DPDT switch), factory-sealed, and rated Nema 4 corrosion resistant. Switch contacts shall be rated 5 amps, 120 volts. The lever arm shall be provided with factory-supplied cord, and appropriate arm length to accommodate with the installation of the limit switch trip plate. Limit switch shall be Allen Bradley 802M, or Cutler Hammer type E50, or approved equal. One spare limit switch assembly shall be provided by the Contractor.

Auxiliary Drive Control.

- A. All motor control components and control devices shall be provided for the control of the auxiliary drive motor as shown in plans, and enclosed in a NEMA 12 cabinet that shall be appropriately sized to enclose all components and devices. A non-fused, cabinet flange-mounted disconnect switch rated 3-pole, 30 amps shall be installed in the cabinet.

- B. A NEMA 4X rated pendant station equipped with 2 non-illuminated momentary contact pushbuttons shall be provided for the “Raise” and “Lower” control of the bridge. The pushbuttons shall be appropriately labeled to clearly show the function of each switch. The pendant station shall be connected to the auxiliary drive control box with a 8-foot, minimum, flexible cable installed with cable strain-relief provisions. A holding bracket fabricated from 10 gage stainless steel shall be provided and wall-mounted beside the auxiliary drive control box to store the pendant station. The pendant station shall be as manufactured by Allen-Bradley, Bulletin 800FC, or by Ace Industries, Inc, or an approved equal.
- C. Circuit breakers for the feeders to the auxiliary drive motors shall be of the molded-case type, UL listed, 100-amp frame, interrupting capacity rating of 22,000 amps at 480 volts, 3-pole, 25 amps, unless otherwise shown on plans. As manufactured by Cutler-Hammer, type GD, or Allen-Bradley, or an approved equal.

Electrical Conductor and Cable:

- A. General. All conductors shall be copper, ASTM Class B stranding. Solid conductors shall not be used. Aluminum conductors shall not be used. Wire and cable shall be rated 600 volts.
- B. Control Panel Wiring. Conductors for control panel internal wiring shall be 14AWG minimum. UL Listed Type SIS with low-smoke, low-corrosivity, and flame-retardant, cross-linked polyethylene insulation, or similar insulation, shall be permitted for use inside control panels.
- C. Field Wiring. Conductors shall be UL listed type XHHW-2 with cross-linked polyethylene insulation suitable for use in wet locations. Conductors shall conform to the applicable requirements of UL Standard 44 and NEMA WC-70/ ICEA S-95-658. Minimum conductor size shall be 12AWG.
- D. Flexible cable shall be UL listed type SOOW, or W extra hard usage flexible cable. Flexible cable shall be suitable for use in outdoor, or in exposed locations. The outer jacket shall be water, sunlight, and oil resistant. The cable shall contain size and quantity of conductors as shown on plans. Conductors shall be soft bare annealed copper per ASTM B-3 with flexible stranding per ASTM B-174. Minimum conductor size shall be 12AWG. Cable fittings shall be specifically designed for the use with the type and size of cable in question. Fittings shall be provided with sealing gaskets to preserve the NEMA enclosure rating of the boxes and/enclosures they are used with.

Conduit. Conduit for indoor installation shall be hot-dip galvanized, rigid steel, and conform to the requirements of ANSI C80.1, UL-6, and UL-514.

Conduit installed exposed outdoor, outside of the control house, shall be rigid metal conduit with plastic coatings, and shall meet the following requirements:

- A. Shall be UL Listed, threaded rigid metal conduit and fittings, and manufactured from high-strength steel conforming to ANSI C80.1, UL6 and UL 514B. Minimum size shall be 3/4 inch.
- B. Shall be manufactured from steel tubing with a wall thickness equivalent to Schedule 40 pipe, with the entire length of the conduit hot-dip galvanized.
- C. The exterior surface of the hot-dip galvanized conduit shall be coated with a factory-applied Polyvinyl Chloride (PVC) coating, at least, 40-mil thick. The exterior coating shall be permanently fused to the hot-dip galvanized surface of the conduit. The adhesion of the PVC coating to the conduit shall be greater than the strength of the coating itself. Overall conduit shall be UL listed with the PVC coating as the primary corrosion protection and the underlying galvanized coating as supplemental protection.
- D. Shall comply with the requirements of NEMA RN1. Independent certified test results shall be available to confirm coating adhesion under the following conditions:
 - 1. Conduit immersed in boiling water with a minimum mean time to adhesion failure of 200 hours per ASTM D870.
 - 2. Conduit and conduit exposure to 65 degrees Celsius and 95 percent relative humidity with a minimum mean time to failure of 30 days per ASTM D1151.
 - 3. The interior coating bond shall be confirmed using the Standard Method of Adhesion by Tape Test per ASTM D3359.
 - 4. No trace of the internal coating shall be visible on a white cloth following six wipes

- over the coating which has been wetted with acetone per ASTM D1308.
5. The exterior coating bond shall be confirmed using the methods described in Section 3.8 of NEMA RN1. After these tests the physical properties of the exterior coating shall exceed the minimum requirements specified in Table 3.1 of NEMA RN1.
 - E. The interior surface of the hot-dip galvanized conduit shall be coated with a factory-applied urethane coating with at least 2 mils in thickness. The interior coating shall afford sufficient flexibility to permit field bending of the conduit without causing cracking or flaking of the interior coating. After the PVC coating of the conduit, clean conduit threads and hot-dip galvanize. Apply a urethane topcoat to the conduit threads after hot-dip galvanizing. Cap all threaded ends of conduit.
 - F. Couplings, elbows, fittings and conduit bodies used with the PVC coated steel conduit shall have the same coating as the conduit. Unless otherwise shown on contract drawings, U-bolts and conduit clamps used for conduit mounting shall have the same coating as the conduit.
 - G. All components (fittings, clamps, etc.) used with PVC coated steel conduit shall be by the same manufacturer as the conduit.
 - H. Shall be Robroy Industries Plasti-Bond REDH₂OT, or Ocal Blue, or approved equal.

Conduit hubs shall be gasketed. Connections to boxes shall be made water-tight and shall be located on bottoms of boxes wherever practical. Top conduit entries shall not be permitted on NEMA 4 cabinets. NEMA 4 cabinets shall include breather and drain fittings similar to Crouse Hinds Series ECD, or OZ/Gedney type DB-50, or approved equal.

UL listed liquid-tight flexible steel conduit conforming to UL-360 shall be used for termination and connection of rigid conduit to motors, and equipment or components that require final adjustment, or subject to vibration, or motion. Liquid-tight connectors and fittings with rubber seal shall be used and properly installed to prevent conduit from pulling away from its connectors.

Conduit Bodies. Use conduit bodies as manufactured by O-Z/Gedney, Robroy Industries, or approved equal, meeting the following requirements:

- A. Shall be UL Listed, galvanized cast iron alloy with threaded hubs and integral bushings, and with galvanized steel or iron alloy covers. All covers shall be screw-in type. Clip-in or other wedge type covers shall not be used. Cover screws shall be stainless steel.
- B. Conduit bodies and associated covers and screws for use with plastic coated conduit shall be PVC coated and be of the same manufacturer as the PVC coated conduit.

Pull Boxes, Junction Boxes, and Terminal Cabinets. Boxes and cabinets shall be sized as required by the NEC, and as appropriate for the conductors or equipment served. Bonding jumpers shall be provided between the door and the box or cabinet body on boxes and cabinets with hinged doors.

Aluminum or steel mounting panels with corrosion resistant finishes, heavy duty terminal blocks for wire terminations, and uninsulated ground bars shall be provided. Ground bars shall be copper for use with copper conductors.

Boxes and cabinets shall meet the requirements of NEMA 250 and UL 50. Unless otherwise indicated on plans, boxes shall be as follows:

1. NEMA 4X Type 316 stainless steel with stainless steel hinges and hardware.
2. NEMA 4 hot-dip galvanized cast iron with stainless steel, or similarly corrosion resistant, hinges and/or hardware.

Boxes and terminal cabinets shall be as manufactured by O-Z/Gedney, Cooper Crouse-Hinds, Hammond Manufacturing, Hoffman, or approved equal.

Labeling.

- A. Conductor Identification. All conductors and terminal blocks shall be permanently labeled at every terminal or connection, splice, and tap. Each conductor shall be assigned a distinct identifying number, including spare conductors, using the similar numbering system as the existing installation, and the assigned numbers and labels shall not duplicate those used in

the existing installation.

Conductor labels shall be machine printed, water and smudge resistant. Hand written labels are not acceptable. Labels shall be snap-on, slide on, or heat-shrink type. Adhesive type labels are not acceptable.

- B. Conduit and Cable Identification. Each conduit and cable run shall be labeled at each termination point, and assigned with a distinct identifying number, using the similar numbering system as the existing installation, and the assigned numbers and labels shall not duplicate those used in the existing installation.

Labels shall be stamped 19 gauge brass tags. Minimum size shall be 1 inch diameter. Tags shall be secured with UV resistant PVC cable ties.

Construction Methods:

General Requirements. All miscellaneous products, tools, equipment, and labor necessary shall be provided to properly complete all Work. All products shall be installed in accordance with their manufacturers' recommendations and the requirements of the NEC and these contract documents. All products shall be physically installed in a secure manner as indicated and as required to provide a reliable installation. All installed products shall be inspected after installation and tested for correct installation, performance, and workmanship.

Prior to commencing the construction, operate the bridge, inspect the entire bridge, record, and document the working conditions of all existing equipment, systems and sub-systems. All recorded data and findings shall be documented in the format prepared by the Contractor. Any deficiency and finding revealed during the inspection and operation of the bridge shall be brought to the attention of the Department in writing. All findings shall be supported by dated photographs taken at time of the inspection, which clearly show the existing conditions of the equipment.

Prior to beginning any other on-site work, the Contractor shall carefully and thoroughly locate and trace all existing wiring and conduits, and develop detailed point-to-point diagrams documenting all existing wire, conduits, boxes, etc. These diagrams, along with the changes shown on the Contract Documents, shall be used as the basis for wire and conduit replacement for the Work.

- A. Conductors. Insulated wires and cables with stranded copper conductors shall be used for the installation. Conductors with green colored insulation shall be used only for grounding conductors. The re-identification of conductors with green colored insulation, such as with colored tape, is not permitted. Conductors for general wiring shall be Type XHHW-2.

A dedicated neutral conductor shall be provided for all branch and feeder circuits requiring a neutral. A dedicated neutral conductor shall not be shared by phase conductors of other circuits.

Equipment grounding conductors shall be provided in all conduit and cable runs. Equipment grounding conductors shall be sized equal to the largest circuit conductor in the conduit or cable, except where shown otherwise on the plans.

Wiring in enclosures, terminal cabinets and junction boxes shall be installed and bundled neatly. Where practical, wiring shall be installed plumb or level, parallel to edges of cabinets, or at right angles.

Wires and cables shall be handled and installed with care to avoid damage to conductors, insulation, jackets, armor, etc. Wire or cable which is found to be damaged shall be replaced at no additional cost.

Conductor for power and control circuits shall be installed separately as required by the NEC, with sizes as shown on plans, and as required for the circuit served. Unless it is indicated otherwise in the plans, field wiring for power circuits shall be at least 10 AWG copper, and at least #12 AWG for field wiring for control circuits.

Power and control wiring inside factory assembled control panels shall be at least #14 AWG, except that at least #18 AWG shall be permitted for low power control circuits (20 volt-amperes, or less, maximum steady-state load).

All conduit and cable runs shall contain a minimum of 20% spare conductors, minimum 2 conductors. Conduits shall be increased in size where necessary to accommodate required spare conductors.

Conductors shall be spliced and tapped only in equipment enclosures, cabinets or junction boxes, and on terminal blocks or with insulated compression crimping-type connectors or as described herein.

- B. Conduit and Cable. Unless specifically indicated otherwise, connections of conduit and cable entrances shall be installed only in the bottom of cabinets and enclosures located in damp and wet locations.

Conduits, boxes and other raceways shall be installed such that they are electrically continuous from end to end. Bonding jumpers and related hardware shall be provided at expansion fittings and elsewhere as necessary to ensure electrical continuity.

Insulated throat bonding bushings or bonding nuts shall be provided where conduits enter metal boxes or enclosures. Bonding bushings and bonding nuts shall be connected to the equipment grounding conductor included in the conduit or cable.

Conduit expansion/deflection fittings shall be provided at all structural expansion joints which are subject to movement, as required to comply with the NEC, and as required to provide a complete and reliable installation.

Bends in rigid conduit shall be made with tools which are specifically designed for bending the type and size of conduit in question. Care shall be exercised when bending conduit to maintain proper internal diameter and wall thickness.

A conduit run between pull points such as conduit bodies, junction/pull boxes, terminal cabinets, and enclosures shall not be made with more than three quarter bends, equivalent to 270 degrees, in one conduit run.

Conduit field cuts shall be made square to conduit and conduit ends reamed to remove burrs. Field cut threads shall have same length, dimensions, and taper as factory-cut threads. Field cut threads shall be cleaned with an appropriate degreasing solvent after cutting and coat with a touch-up compound as recommended by the conduit manufacturer and a urethane topcoat. Any area on the interior of the conduit which has been disturbed by reaming shall be similarly treated.

All installers of PVC coated conduit shall be certified by the manufacturer of the conduit.

PVC coated rigid metal conduit shall be installed, using tools and methods which will not cause damage to the PVC coating, and in strict accordance with installation instructions provided by the conduit manufacturer. Any areas on the exterior of the conduit which have been damaged during installation shall be coated with an exterior patching compound as recommended by the conduit manufacturer.

Defects (nicks, scars, cuts, tears, abrasions, etc.) to the PVC coating of PVC coated RMC conduits which are 3 inches or more in length shall be repaired by replacing the entire section of conduit. Defects to the PVC coating which are less than 3 inches long may be repaired with an appropriate repair compound as recommended by the conduit manufacturer and approved by the RE.

Liquid-tight flexible steel conduits shall be installed in accordance to the following conditions:

1. In lengths not to exceed 24 inches for final connection to motors and similar

equipment subject to vibration.

2. Where flexibility is required, lengths shall not exceed 24 inches, unless explicitly indicated otherwise or with the special permission of the Engineer. Flexible conduit shall not be used in lieu of bends in rigid conduit, except as may be allowed by the Engineer by special permission.

Wireways shall be used only where specifically indicated.

Raceway system shall be thoroughly swabbed before installing conductors. Pulling lubricant shall be used to facilitate installation of wire and/or cable in conduits. Lubricant shall be UL Listed, environmentally friendly, Teflon based lubricant which is safe for use with all cable types and does not harden in conduit.

Conductors and cables which are damaged during shipping, handling, storage or during the installation, or due to high pulling tension during the installation as revealed during any inspection or tests, shall be replaced as required or as directed by the Engineer to his satisfaction,. Such replacement shall not be considered cause for delay or additional payment.

Rigid conduits shall be supported near each elbow and within 18 inches of each box, enclosure, conduit body, or similar termination, and at regular intervals not to exceed 6 feet.

Flexible conduits shall be supported near each elbow and within 12 inches of each box, enclosure, conduit body, or similar termination, and at regular intervals not to exceed 3 feet, except where flexibility is required.

Where not explicitly shown on the plans, support types and attachment methods of conduit and cable shall be as follows or as otherwise directed by the RE:

1. Stainless steel metal framing strut by B-Line, Unistrut, Thomas & Betts, or approved equal with compatible stainless steel clamps.
2. Stainless steel one hole straps or hangers.
3. Galvanized malleable iron one-hole clamps with clamp backs.
4. Stainless steel U-bolts with fabricated stainless steel brackets, or with stainless steel metal framing strut by B-Line, or Unistrut, or Thomas & Betts, or approved equal.
5. Stainless steel U-bolts with trapeze hangers which shall be constructed from hot-dip galvanized steel or stainless steel angle or channel and stainless steel threaded rod.

Plastic-coated clamps and U-bolts shall be used with plastic coated rigid metal conduit. Plastic coating shall satisfy the requirements for coating for plastic coated rigid metal conduit. PVC coated conduit supports shall be of the same manufacturer as the PVC coated conduit.

Conduit penetrations through walls, floors, and ceilings shall be provided at indicated locations and as necessary for the installation of conduits. Following the installation, floors, walls and ceilings shall be restored with materials equal to the original construction and finish to match surrounding surfaces. Materials used shall be subject to the approval of the Engineer for appropriateness. Conduit penetrations shall be repaired in concrete with non-shrink grout, and seal with silicone caulk as necessary.

All conduit runs installed in wet or damp locations shall be arranged to allow drainage at low points, and to drain away from boxes and enclosures in wet and damp locations. Conduit drain fittings shall be installed at the low point(s) of all conduit runs in wet and damp locations.

Conduit drain fitting shall consist of a conduit body and screened drain. The screened drain shall be installed down to permit proper drainage and help prevent water ingress through the drain. Drain body shall be copper-free aluminum, and screen shall be stainless steel. Crouse-Hinds CD Series, or approved equal. Apply an anti-oxidant and anti-seizing compound (Ideal Noalox, or equal) to the threads of the drain before installing in the conduit body.

- C. Enclosures, Cabinets, Junction/Pull Boxes, Device Boxes. Boxes and cabinets shall be installed plumb and level. Anchor cabinets securely as indicated and as required to provide a dependable installation.

Aluminum boxes and cabinets shall be isolated from concrete and dissimilar metals with neoprene shims. Aluminum boxes and cabinets shall not be installed in contact with the ground. Boxes and cabinets which are not stainless steel shall be isolated from unpainted steel with neoprene shims.

Boxes, cabinets, and enclosures shall be bonded directly to each equipment grounding conductor, not just through the conduit and or connectors. This connection may be made by a jumper tapped to the main equipment grounding conductor.

- D. **Grounding and Bonding.** Grounding and bonding shall be provided in compliance with the requirements of NEC Article 250 for grounding and bonding.

Raceways and metallic cable armor/sheaths shall not be used as the sole grounding or bonding conductor for any circuit.

All electrical equipment shall be solidly connected to the equipment grounding conductor serving that equipment.

Ground buses of all equipment and devices shall be connected to the nearest substantial structural steel member. Bonding jumpers shall be sized equal to the equipment grounding conductors serving the equipment. Installation of the bonding jumper shall conform to the requirements for grounding electrode conductors given in the NEC. When installing a bonding wire in junction boxes, terminal cabinets and enclosures, bare ground wire shall be used.

- E. **Identification Nameplates.** All major items of electrical equipment and major components shall be marked with an identification name to identify the equipment by type or function and specific unit number as indicated. Designation of motors shall coincide with their designation in the motor control panel. Unless otherwise specified, identification nameplates shall be made of laminated plastic with black outer layers and a white core. Edges shall be chamfered. Plates shall be fastened flat with black-finished round-head drive screws, or other approved non-adhesive metal fasteners. When the nameplate is to be installed on an irregular-shaped object, the Contractor shall devise an approved support suitable for the application and ensure the proper installation of the supports and nameplates.

BR 1-687, Walnut Street Bridge. The Contractor shall properly sequence and coordinate all Work to minimize disruption to normal roadway and waterway traffic. Department approved temporary traffic control equipment and methods, including flagmen and trucks with warning lights and crash buffers, shall be used to close the roadway for operation of the bridge in the event that any portion of the traffic control system such as signals, warning gates, and barrier gates, is inoperable during any period when the bridge is open to roadway traffic.

- A. **Traffic Gate Interlocks (E1)**

The contractor shall modify the control circuit for the “North Traffic Gates Lower” control relay/contactors to add an interlock contact to insure that the South Traffic Gates (on-coming gates) are in the lowered position before the North Traffic Gates (off-going gates) can be lowered. The contractor shall provide any necessary relays, mounting hardware, and wiring to provide the interlock.

The contractor shall modify the control circuit for the “South Traffic Gates Raise” control relay/contactors to add an interlock contact to insure that the North Traffic Gates (off-going gates) are in the raised position before the South Traffic Gates (on-coming gates) can be raised. The contractor shall provide any necessary relays, mounting hardware, and wiring to provide the interlock.

A bypass selector switch mounted on the control console and associated wiring shall be provided for the interlock contacts.

- B. **East and West Span Locks Limit Switch Adjustment (E2)**

The contractor shall provide the necessary labor and materials to modify the existing angle mounting brackets for the east and west span locks limit switches (4 total switches). The existing brackets do not allow for adjustment of the switches to match the travel of the span locks.

If it is feasible, the existing brackets shall be modified to relocate the limit switches. Type 316 stainless steel plate and/or angle material, ¼” minimum thickness, shall be used to extend the existing brackets.

The contractor shall provide necessary wiring and conduit for the relocation of the existing limit switches. The contractor shall be responsible for replacing any components damaged during the course of the work.

The contractor shall prime and paint any bare or disturbed steel surfaces to match the surrounding surfaces.

C. East and West Span Lock Hand-Crank Covers and Limit Switches (E3)

The contractor shall fabricate and install covers for the east and west span lock gearbox hand-crank shafts. The design shall follow the concept shown in the plans. Changes to the design shall be approved by the Engineer.

New limit switches shall be provided and installed to detect the removal of the cover for manual operation of the span locks. Switches shall be wired as shown in the plans. A separate ground conductor shall be provided for each switch.

The contractor shall provide and install components to modify the control circuits as shown in the plans. New indicator lights and control devices shall be installed on the existing control console. The new indicators shall be integrated into the existing light test circuit.

BR 1-693, Fourth Street Bridge. The bridge shall be maintained operable at all times during the repair. Any disruption of bridge operations shall be explicitly permitted by the Department prior to performing any repair Work. The Contractor shall properly sequence and coordinate all Work to minimize disruption to normal roadway and waterway traffic.

A. Generator and Transfer Switch (E4)

The contractor shall remove the existing in-operable generator and the existing transfer switch in the control house, used for switching between the existing utility power and the back-up power from the existing generator room. All existing wiring, conduits, fuel pipes, and venting and exhaust piping pertaining to the removed generator and transfer switch shall be removed. The removed materials shall become the property of the contractor and removed from the construction site. The existing generator and transfer switch may be salvaged as directed by the Department. The contractor shall coordinate and arrange with the Department for delivery of the salvaged generator and transfer switch to a location as directed by the Department representative. The existing transfer switch shall be boxed prior to delivery.

When temporary removal of existing door, or window, or louver is deemed necessary for the removal and transportation of the existing equipment and of new equipment in and out of the generator room, the Contractor shall submit proposed removals and procedures to the Department for review, approval and for acceptance of the temporary removal.

When temporary removal is approved by the Department, the Contractor shall take photographs or create sketches of the existing materials to be removed prior to the temporary removal, and shall use the photographs or sketches as record for the reinstallation of the removed materials that shall be performed immediately after the openings are no longer needed. During the temporary removal of door or window, the contractor shall bear full responsibility and provide means to protect the control house from unauthorized entry of the public or personnel, and from contamination of dust or debris to the interior rooms. All removed door or window shall be reinstalled and restored, at least, to its original condition to the satisfaction of the Department.

The new generator shall be installed in the same location as the removed generator. To the extent practical, the new transfer switch shall be installed in the same location as the removed switch. Where mounting space is not permitted, a new location is permitted, provided that mounting details shall be prepared and submitted for review and approval prior to installation.

All existing intake and exhaust louvers and motorized dampers shall be reconnected for operation with the new generator. The contractor shall provide galvanized sheet metal to repair and/or replace in-kind the existing radiator exhaust duct to accommodate the installation of the new generator. All intake and exhaust motorized dampers shall be opened when the new generator is started up and running, and closed when the generator is shut-off.

The generator engine exhaust pipe outside of the generator room shall be extended at least 24 inches above the roof of the house, unless it is required otherwise by the Department or by any applicable local rule. Wall-mounted stainless steel supports shall be provided for the attachment of the exhaust pipe to

the house. The Contractor shall locate the generator engine exhaust piping without obstructing any window opening in the operator's room.

All engine exhaust and fuel venting shall be vented to the outside, using existing wall penetrations that shall be sealed and made water-tight after installation.

The contractor shall provide a warning sign read "GENERATOR BACK-UP POWER IS FOR LIGHTING, HVAC AND AUXILIARY DRIVE LOADS ONLY". Lettering shall be 3-inch high, and the sign shall be permanently and conspicuously placed or affixed in the generator room to caution personnel for the use of the new generator.

B. Auxiliary Drive (E5)

The contractor shall install for each bascule leaf a new auxiliary drive motor as specified in the specifications of the Mechanical Repair for Fourth Street Bridge. The contractor shall provide all required materials and labor to connect power and controls to the new auxiliary drive motors as shown in plans.

All existing limit switches for the indication of the brakes being hand-released on the existing motor brakes and machinery brakes of the bridge shall be removed and replaced. Replacement of the existing limit switches shall not prevent the operation of the bridge. The new limit switches shall be installed, located, and adjusted duplicate the function of the existing limit switches and to provide control interlocking of the new auxiliary drive as shown in plans.

A sprocket guard shall be fabricated and installed on each auxiliary motor to provide control interlocking to the existing normal drives of the bridge. This control interlocking shall prevent the operation of the existing normal drive system if the sprocket guard is removed for the installation of the sprocket chain.

The contractor is responsible for locating, tracing, identifying and documenting the existing control circuits prior to installing the required interlocking for the existing brakes and normal drives.

Testing. The Contractor shall be responsible for performing all testing, inspections, and any resulting corrective work to ensure that, after the installation of the new electrical materials and equipment, the entire bridge power and control systems will properly function as intended and as recorded by the Contractor prior the removals and as modified and required by the plans and Special Provisions.

In addition to the specific tests described herein, the contractor shall perform all additional testing, and make any necessary repairs or adjustments and as otherwise necessary to provide a complete, functional, and reliable installation. All testing, inspections, and demonstrations, and any resulting remedial work, will be deemed solely the responsibility of the Contractor and will not be considered cause for delay or additional payment.

Use test procedures and equipment in accordance with manufacturer's recommendations, NETA Acceptance Testing Standards, any other applicable industry standards, and be appropriate for the specific test being performed. Use true RMS type voltmeters and ammeters.

A. Testing and Inspection after Installation. After the installation of the conduit system and prior to the installation of the wiring, visually inspect the conduit to ensure that the conduit has no physical damage that reduces its cross-sectional area such as dent, kink, or twist, and is ready for wire pulling. Visually inspect to ensure that all conduit supports, clamps, and hardware are properly installed and torqued, and conduit expansion/deflection fittings, flexible conduits or other means are properly bonded and provided at proper locations to compensate for the movement of the structures.

Visually inspect to verify the proper operation of the operating mechanism and mechanical interlocks, and the proper installation of all newly-installed equipment and devices.

After all wires have been installed and prior to connections of any circuit, test to verify that all installed conductors are free of shorts, opens, or unintentional grounds, and properly terminated.

Perform tests prior to energizing any circuit and prior to connections to equipment or motors to verify the following conditions:

Correct no-load voltage for the equipment to be powered
Correct phase sequence
Correct polarities.

After all connections have been made to all equipment and devices, visually inspect all electrical connections, and verify that all lugs, connectors, and terminals are tightened and torqued to the levels recommended by the manufacturer.

- B. Testing of Motors and Machinery. Prior to first operation of any motor or motor driven machinery, confirm proper motor rotation with all driven machinery disconnected or otherwise suitably arranged to prevent damage in the event of incorrect rotation. After confirming proper rotation, record the correct circuit phase to motor terminal connections on the as-built plans and working drawings.
- C. Operational Tests and Demonstrations. When the installation of the new generator and the new automatic transfer switch (ATS) of the Fourth Street Bridge is complete with all existing intake and exhaust louvers connected, test-run the generator to ensure that all settings and status indication are correct. Test the generator in conjunction with the ATS by turning off the incoming power to the bridge. The generator shall be automatically started upon the power outage, and the ATS shall transfer to the generator power after a preset time delay. Upon the restoration of the incoming power to the bridge, the ATS shall retransfer to the incoming power lines after a preset time delay. The generator shall remain running for a preset time set by the manufacturer prior to being automatically shut-off.

When the installation of all systems is complete and ready for testing, test-run the bascule bridge. The bridge shall demonstrate a trouble-free operation. Perform additional miscellaneous operational tests as requested by the Department Representative to demonstrate and establish that a given product, system, or subsystem meets all specified requirements, and is operating in a reliable manner.

- D. Traffic Gate Interlocks. Test and verify all new traffic gate operating safety interlocks for the Walnut Street bridge.
- E. Corrective Actions. For any test failure, or for any test result which fails to meet the specified requirements or the stated acceptable values or conditions, or the Department representative finds unacceptable, the Contractor shall investigate the cause of the failure, take appropriate corrective actions, and repeat the test(s). This procedure shall be repeated until such time as all test results are deemed acceptable by the Department Representative.
- F. Final Testing. At the completion of the installation of all repair Work, operate the bridge span in the presence of and witnessed by the Department Representative. Accordingly, notify the Department Representative, at least, 2 weeks prior to the test date. Operate the bridge through at least 3 complete consecutive and error free cycles, without failure of any system or component, including the opening and closing sequences. Operation of each bascule leaf through the normal full opening and closing with the auxiliary drive shall be provided for Fourth Street Bridge with the normal power and the back-up power. All motorized intake and exhaust dampers shall properly function with the generator operation. Verify that the safety interlock for the auxiliary drive chain covers at the Fourth Street Bridge function acceptably.

Method of Measurement:

The quantity of Repair Bridge Electrical System will not be measured.

Basis of Payment:

Payment for the electrical repairs to the Walnut Street and Fourth Street Bridges will be made on a lump sum basis. The lump sum price shall include the costs of all removals, temporary generator room modifications, delivery of salvaged materials, new materials, labor, equipment, testing, coordination, and field verifications to complete the installation and repair work as shown in plans and described herein, and to deliver a trouble-free repair work to the satisfaction of the Department.

The lump sum bid for item 746662 shall be the sum of the cost for all the structures listed. The completed breakout sheet shall be attached to the Bid Proposal. Failure to submit the breakout sheet with the Bid Proposal will result in the Bid Proposal being declared non-responsive and rejected.

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The Department reserves the right to delete from the Contract one or more of the electrical repairs and the lump sum to be paid will be reduced in accordance with the Contractor's cost listed for that/those repairs. There will be no extra compensation to the Contractor if such deletion is made.

4/6/11

748517 - BLACKOUT TAPE, 4"
748518 - BLACKOUT TAPE, 6"
748528 - BLACKOUT TPE, 8"

Description:

This work consists of furnishing, installing and removal of blackout tape in accordance with the details and notes on the Plans and as directed by the Engineer.

Materials and Construction Methods:

The tape shall have a raised, patterned surface and shall obliterate the existing pavement markings. Preparation, application and removal shall be in conformance with the Plans and the manufacturer's recommendations. Any failure of the tape to remain in place or adequately mask the existing pavement markings shall be corrected at the Contractor's expense.

If any of the existing pavement markings are damaged or removed due to the removal of blackout tape, the Contractor shall restore these areas as directed by the Engineer and this work and material will be at the Contractor's expense.

It is the intent of this item of work to totally obliterate existing pavement markings. To accomplish this, it may be necessary to use a blackout tape width greater than the nominal width of the pavement striping i.e. use 6" (150 mm) blackout tape to cover a 4" (100 mm) strip.

Method of Measurement:

The quantity of blackout tape will be measured as the number of linear feet (meter) of blackout tape installed and accepted.

Basis of Payment:

The quantity of blackout tape will be paid for at the Contract unit price per linear Foot (meter) of the size specified. Price and payment will constitute full compensation for preparing the pavement surface, furnishing and placing all materials, and for all labor, tools, equipment and incidentals necessary to complete the work.

1/25/01

748525 - TEMPORARY MARKINGS, TAPE, 4"
748526 - TEMPORARY MARKINGS, TAPE, 6"
748527 - TEMPORARY MARKINGS, TAPE, WORDS/SYMBOLS

Description:

This work shall consist of furnishing, installing, removing or obliterating pavement markings in work zones in accordance with this provision and in reasonably close conformity with the dimensions and lines shown on the plans or established by the Engineer.

Materials:

The markings shall consist of white or yellow retro reflective pavement marking on a conformable backing.

The quality of the pavement marking shall be such that the performance requirements for the marking shall be met.

The markings shall be precoated with a pressure sensitive adhesive and shall be capable of being adhered to Asphalt concrete or Portland cement concrete at temperatures as low as 50°F (10°C) in accordance with the manufacturer's recommendations. A surface preparation adhesive recommended by the manufacturer shall be used for all applications to improve initial and long term adhesion.

When stored in a cool dry area indoors, the materials shall be suitable for use for one year after the date of purchase.

Classification:

The removable retro reflective pavement marking tape must be designed and constructed in such a manner that it can be readily removed when the markings are no longer applicable. The tape shall be capable of performing for the duration of a normal construction season and shall then be capable of being removed intact or in large pieces. The tape shall be wet and dry reflective throughout its useful life. (A normal construction season is defined as the time after the last snowplowing in the spring and before the first snowplowing in the fall/winter. In non-snow removal locations, a normal construction season is limited to the calendar year at the time of installation.)

Requirements:

Composition

The removable, retro reflective pavement markings shall consist of a highly reflective white or yellow enclosed lens pavement marking with a thin, flexible, conformable backing which is precoated with a pressure sensitive adhesive.

Retro reflectance

The enclosed lens white and yellow pavement markings shall have the initial minimum retroreflectance values as shown in Table 1 under dry, wet, and rainy conditions at 1.05° observation angle and 88.76° entrance angle. These angles represent a simulated driver viewing geometry at 30 meters distance. The photometric quantity to be measured shall be the coefficient of retroreflected luminance (R_L), and shall be expressed as millicandelas per square meter per lux $[(mcd \cdot m^{-2}) \cdot lx^{-1}]$. The English equivalent shall be expressed as millicandelas per square foot per foot candle $[(mcd \cdot ft^{-2}) \cdot fc^{-1}]$

Retroreflectance values shall be measured under dry conditions in accordance with ASTM D 4061. The angular aperture of both the photoreceptor and light projector shall be 6 minutes of arc. The reference center shall be the geometric center of the sample, and the reference axis shall be taken perpendicular to the test sample.

Values measured under wet conditions shall be measured in accordance with ASTM E 2176 or ASTM E 2177 using a portable retroreflectometer. Wet retroreflectance values measured under a "condition

of continuous wetting” (simulated rain) shall be in accordance with ASTM E 2176. Wet retroreflectance values measured under a “condition of wetness” shall be in accordance with ASTM E 2177.

Visually, the reflective performance shall be similar whether the material is dry or wet.

Table 1: Minimum initial R_L under dry, wet and rainy conditions		
	White	Yellow
Entrance Angle	88.76°	88.76°
Observation Angle	1.05°	1.05°
Retroreflected Luminance	750	450
$R_L [(mcd \cdot m^{-2}) \cdot lx^{-1}]$		

Removability

The marking film shall be removable from Asphalt concrete and Portland cement concrete intact or in large pieces, at temperatures above freezing without the use of heat, solvents, grinding or blasting without permanently scarring the roadway surface.

Skid Resistance

The surface of the markings when new provides an average skid resistance value of 50 BPN when tested according to ASTM E 303.

Color

The x,y chromaticity co-ordinates for dry markings shall lie within the regions defined by the following corner points:

	1		2		3		4	
	x	y	x	y	x	y	x	y
White	0.355	0.355	0.305	0.305	0.285	0.325	0.335	0.375
Yellow	0.560	0.440	0.460	0.400	0.420	0.440	0.490	0.510

Daytime appearance¹

The appearance of the marking in daylight or under road lighting conditions can be determined by measuring the reflection in diffuse conditions. The luminance coefficient in diffuse illumination (Qd) is measured using a portable Qd reflectometer incorporating “30 meter” geometry. The Qd shall be greater than 130 [(mcd • ft⁻²) • fc⁻¹] when newly applied.

Note: The luminance coefficient (Qd) under diffuse illumination represents the brightness of a road marking as seen by drivers of motorized vehicles in typical or average daylight or under road lighting conditions.

¹Reference CEN Standard EN 1436.

Construction Methods:

Pavement markings in work zones shall be placed in accordance with the following provisions:

At the end of each day's work, pavement markings shall be in place on each paving lift that is open to normal traffic flow. Materials requiring removal shall be specified above, and marking configurations shall be in accordance with the Manual on Uniform Traffic Control Devices.

The pavement markings shall be maintained and replaced by the Contractor without additional compensation until they have served their purpose, at which time the contractor will be required to remove them.

Pavement markings shall be applied to clean dry surfaces in accordance with the manufacturer's installation instructions or a method approved by the Engineer.

Method of Measurement:

Linear pavement markings will be measured in linear feet complete-in-place for the width specified.

Removal or obliteration of pavement markings in construction work zones will not be measured for payment, but shall be considered incidental to the work.

Basis of Payment:

Retro reflective pavement markings will be paid for at the contract unit price, which price shall be full compensation for cleaning and preparing the pavement surface, for furnishing and placing all materials, and for all materials, labor, tools, equipment and incidentals necessary to complete the work.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Temporary Marking, Tape, linear	Linear Foot
Temporary Marking, Tape, words/symbol	Square foot

2/3/05

748530 - REMOVAL OF PAVEMENT STRIPING

Description:

This work consists of removing pavement markings of all kinds including paint, tape, etc., in accordance with this special provision, notes on Plans and/or as directed by the Engineer. The Contractor shall coordinate with the Engineer for maintaining traffic during the operation, prior to starting the work.

Materials and Construction Methods:

Paint and Epoxy Resins:

Shot/abrasive grit blasting or water blasting equipment shall be used for removal of markings from pavement surfaces.

Alkyd Thermoplastic:

In addition to the removal techniques discussed for paint and epoxy, burning or grinding (erasing machines) equipment may also be used for removal of markings from pavement surfaces.

The removal operation shall be performed in a manner that will not damage the pavement surface.

The Contractor shall collect and dispose of all shot/abrasive grit and pavement marking materials removed from the pavement surface. Washing or sweeping such material to the roadside will not be permitted.

After removal of striping on bituminous concrete, approved flat black paint or asphalt sealer shall be used to cover any exposed aggregate or embedded paint at no additional cost.

Method of Measurement:

The quantity of pavement striping removal will be measured as the number of square feet (meters) of pavement striping removed and accepted. The area of lines will be calculated by multiplying the nominal width of line times the length and the area of symbols will be as specified in Subsection 748.10 of the Standard Specifications.

Basis of Payment:

The quantity of pavement striping removal will be paid for at the Contract unit price per square foot (meter) for "Removal of Pavement Striping". Price and payment shall be full compensation for furnishing all materials, removing the pavement markings, disposing of the removed marking material, covering up the exposed aggregate, and for all labor, equipment, tools and incidentals necessary to complete the work.

Note:

There will be no measurement and payment for removal of pavement markings placed incorrectly by the Contractor.

01/09/06

749687 – INSTALLATION OR REMOVAL OF TRAFFIC SIGN ON SINGLE SIGN POST

Description:

This work consists of installing or removing traffic sign(s) on a single post at the locations indicated on the Plans or as directed by the Engineer. This specification also includes installation of posts in boring holes constructed under other items.

A single sign totaling more than 9 square feet, or with any dimension, length or width, greater than or equal to 48 inches shall be installed on multiple sign posts under Item 749690 – Installation or Removal of Traffic Sign on Multiple Sign Posts.

Materials:

The Department will provide all sign materials to be used on this project. The Contractor shall contact the DelDOT Sign Shop Supervisor with project plans and quantity sheets at 302-760-2581. Sign fabrication orders require a minimum of four (4) weeks for completion. Orders placed with less than 4 weeks lead-time will result in a delay. Any delay caused by inadequate lead-time due to a late order will be the sole responsibility of the Contractor. The Contractor shall pick-up the sign materials from the DelDOT Sign Shop and deliver them to the job site without any damage to the sign materials.

Construction Methods:

The Contractor shall pick-up necessary signs, sign posts, hardware, and extensions from the Department and install the signs in the locations indicated on the Plans in accordance with the DelDOT MUTCD or as directed by the Engineer. The Contractor shall be responsible for obtaining all necessary utility clearances before the signs may be installed. For sign removals, the sign posts shall have all nuts, bolts, and other connectors removed. The disturbed ground shall be graded and backfilled accordingly. All signing materials removed from the project shall be returned to the DelDOT Sign Shop without any damage to the sign materials.

Method of Measurement:

The number of single sign installations or removals will be measured as the actual number of sign posts installed or removed and accepted.

Basis of Payment:

The quantity of single sign post installations or removals will be paid for at the Contract unit price per each. Price and payment will constitute full compensation for installing or removing signs and sign materials, pick-up and delivery of sign materials, grading disturbed areas, and for all labor, equipment, tools, and incidentals required to complete the work. Signs that are not installed in accordance with the DelDOT MUTCD or signs installed in the incorrect location shall be moved at no additional cost to the Department.

2/2/11

763500 - MAINTENANCE OF TRAFFIC

Description:

This item shall consist of all work performed by the Contractor to maintain vehicular, bicycle and pedestrian traffic through the project's work zones, including, but not limited to, the passage through the area of persons with disabilities in accordance with the Americans with Disabilities Act of 1990 (ADA) Title II, paragraph 35.130. All work associated with this item shall be completed as shown on the Plans or as directed by the Engineer.

All work shall be performed in a manner that will reasonably provide the least practicable obstruction to all road users, including vehicular traffic, bicycle traffic and pedestrian traffic. All temporary traffic control and temporary traffic control devices shall comply with the contract documents and with the latest edition of the manual titled "Delaware Department of Transportation Manual on Uniform Traffic Control Devices (MUTCD)," hereafter referred to as the "Delaware MUTCD", including all revisions as of the date of the advertisement of this Contract.

This item shall include installing, maintaining and/or relocating the temporary traffic control devices depicted in the approved Temporary Traffic Control (TTC) Plan, standard Delaware MUTCD TTC Cases and as required by project phasing.

The safety measures outlined within this Contract and the Delaware MUTCD are not necessarily sufficient in every instance to guarantee the protection of the traveling public or the persons working on the project. Therefore, the provisions of this Contract do not relieve the Contractor of the sole responsibility for the safety of all persons working within or traveling through the work zone throughout the duration of the project. The Contractor shall implement any additional safety measures that are not expressly required by the Contract and are necessary to ensure the safety of all persons. The Contractor shall submit to the Engineer justification for deviations from the TTC plan or additions to the TTC plan included in the contract documents. Final approval of the deviations or additions shall rest with the Engineer.

The Department reserves the right to stop the Contractor's operations, if in the opinion of the Engineer:

1. The Contractor's operations are not in compliance with the Delaware MUTCD, the specifications or the Plans.
2. The Contractor's operations are unsafe.

Construction Methods:

If the Contractor desires to deviate from the Temporary Traffic Control Plan (TTCP) provided in the Contract Documents or desires changes to the phasing or scope of the TTCP, the Contractor shall submit a new TTCP to the Engineer for approval prior to the start of work at each and every location. The TTCP shall be prepared, signed and sealed by a Professional Engineer registered in the State of Delaware and shall be prepared in accordance with all applicable DelDOT standards. The TTCP shall be submitted 14 calendar days in advance of starting work. Longitudinal dimensions for maintenance of traffic configurations may be adjusted slightly to fit field conditions as directed by the Engineer.

When specified by a note in the project plans, the Contractor shall be required to have an American Traffic Safety Services Association (ATSSA) certified Traffic Control Supervisor on the project. 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. He/she shall also serve as the liaison with the Department concerning the Contractor's maintenance of traffic. The name and contact information for the ATSSA certified Traffic Control Supervisor shall be provided to the Engineer at the Preconstruction Meeting. A copy of the certifications for the ATSSA certified Traffic Control Supervisors proposed for the project shall be submitted to the Department with the Contractor's bid package. The cost of the ATSSA certified Traffic Control Supervisor shall be incidental to this item.

The Department will not make payment to the Contractor for any and all temporary traffic control devices where the Contractor sets up temporary traffic control to perform work, but fails to perform any work. This does not include long-term temporary traffic control set-ups that are installed as part of the maintenance of traffic plans outlined in the contract documents.

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 Contractor shall stake out locations of permanent warning signs in the field and receive approval from the Engineer for the location and method of mounting prior to ordering the signs. The Contractor, with the Engineer, shall inventory all existing signs within the Contract limits. Signs that must remain in place during the project shall be maintained by the Contractor. Any other existing signs shall be removed and properly stored by the Contractor to prevent loss or damage. Immediately prior to the final inspection, the Contractor and the Engineer shall again inventory the traffic signs and account for any lost or damaged signs. The Contractor shall replace or reimburse the Department for any lost or damaged signs.

Access to all businesses and residences within the Project limits shall be maintained throughout the duration of this Contract. Any temporary closure of a driveway or entrance for tie-in purposes shall be coordinated with the Engineer and the property owner in advance of the closure.

Access to all transit stops located within the project limits shall be maintained unless otherwise directed by the Plans or the Engineer. Maintaining access to the transit stop shall include maintaining an area for the transit vehicle to stop to pick-up and drop-off passengers and also an accessible path for pedestrians to safely access the transit stop.

The Contractor shall provide all property owners and residents who live adjacent to the work zone with written notice, 48 hours in advance of the start of construction work. This notification shall include the scope of work, working hours, anticipated start and completion dates, a summary of construction activities which may interfere with access to the property including a schedule and access coordination plan, Contractor's name and address, and a DelDOT contact phone number. Failure to give proper notice will result in a suspension of the work requiring notice, until proper notice is provided. The Contractor shall provide written verification to the Engineer that the property owners and residents were notified.

All roadway closures or lane closures beyond those specified and approved in the Contract Documents, shall be approved by the Chief Traffic Engineer or Designee a minimum of 48 hours in advance of the proposed restriction.

The Contractor shall notify the Engineer no less than fourteen (14) calendar days prior to the start of any detours and road closures and the Engineer will then notify the following entities:

- Local 911 Center
- Local schools
- Local post offices
- DelDOT's Transportation Management Center (TMC)
- Town Managers
- Local Police
- Local Fire Department and Emergency Medical Services
- DelDOT's Public Information Center
- Delaware Transit Corporation (DTC)

Immediately prior to the implementation of any lane or roadway closures, the Engineer shall notify the DelDOT TMC at (302) 659-4600. Notifications shall also be given to the TMC when the closure is lifted. The Engineer shall notify the TMC and the district Safety Officer if 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 was notified.

The Contractor shall conduct construction operations in a manner that will minimize delays to traffic, and shall meet the following requirements:

1. If work is being conducted within 200 feet in advance or up to 200 feet beyond an intersection that is controlled by a traffic signal, the Flagger shall direct the flow of traffic in concert with the traffic signal 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).
2. If work is being conducted within a signalized intersection or series of signalized intersections, the Engineer shall notify the DeIDOT TMC no less than 24 hours in advance of the operation. If work is being conducted within a signalized intersection, a Traffic Officer may direct traffic against the operation of the traffic signal only until the operation occurring within the intersection is completed. When the operation within the intersection is complete, the Engineer shall notify the DeIDOT TMC that the intersection is no longer impeded by construction activities.
3. Work in the vicinity of traffic signals shall be scheduled to minimize the time during which the signal is operated without detectors. Prior approval of the Engineer shall be required for such work to be scheduled. The Contractor shall submit a schedule to the Engineer for approval seven (7) days in advance of the proposed start date of this work. The DeIDOT Transportation Management Center (TMC) requires 48 hours advance notice of the cutting of a loop detector, and immediate notification once the loop detector has been reinstalled. The Contractor shall coordinate with the Engineer sufficiently in advance of loop detector work to ensure that these requirements are met.
4. When a lane adjacent to an open lane is closed to traffic, the temporary traffic control devices shall be set 2' (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.
5. 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 one hour. Lanes shall be reopened immediately upon completion of the work. For moving operations the lane closure shall be shortened as work progresses and as traffic conditions warrant to keep the length of the closure to a minimum. 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 the Contractor's operations if, in the opinion of the Engineer, such operations are impeding traffic unnecessarily.

It is required that all 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. Corrective actions on severe deficiencies shall be taken immediately unless otherwise 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 could result in possible suspension of work until items identified are brought back into compliance and/or the holding of the pay estimate until the serious deficiencies are corrected.

At the end of each workday, 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 Road 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 by the end of each workday. Placement of TRM shall be completed in accordance with the applicable sections of the Delaware Standard Specifications and shall be incidental to the appropriate item in the Contract. If temporary elimination of a drop-off hazard cannot be

accomplished, then the area shall be properly marked and protected with additional temporary barriers, barricades, warning signs, flashing lights, etc. as required by Section 6G.21 of the Delaware MUTCD.

If an open trench accessible by vehicular traffic cannot be backfilled prior to the end of the working day, steel plates may be used to protect the trench area. Shop drawings for the steel plates shall be submitted to the Engineer for approval prior to starting construction. The Engineer shall forward the shop drawings to the Bridge Design Section for review and approval. The shop drawing shall show the intended method to brace, sheet, support or shore the excavation and to prevent a trench failure while the walls of the trench are under the load of traffic. The plan should include details of the plating design, the method of fastening plates, plate thickness, span, bearing and the method of preventing the movement of the plates. This design shall be prepared and signed by a Professional Engineer registered in the State of Delaware. Whenever steel plates are placed on a travel lane or shoulder, the associated temporary traffic control related to the use of steel plates shall follow the standards presented in Table 6G-1 of the Delaware MUTCD. The Contractor is required to provide a ramp (wedge) around the steel plate using bituminous temporary roadway material (TRM) placed at a slope of 20 to 1 or flatter. The cost for the wedge material shall be incidental to the item being constructed. If steel plates are used, the cost of furnishing and installing steel plates, bracing, sheeting, supporting or shoring the excavation and the preparation of shop drawings shall be incidental to the item being constructed. Steel plates are not permitted between November 1 and April 1, without the prior approval of the Engineer.

If pavement marking information is not provided in the Plans, the Contractor shall submit detailed drawings (including but not limited to, lane and shoulder widths, turn lane lengths, locations of stop bars, turn arrows, crosswalks and railroad crossings) that depict the existing pavement markings for each project location prior to beginning construction. These drawings will be reviewed by the Department's Traffic Section to determine if any changes to the final pavement markings are required.

At the end of each day's operation and before traffic is returned to unrestricted roadway use, temporary striping shall be applied to locations that require permanent striping. Temporary pavement striping shall match permanent pavement striping as shown on the Plans or as directed by the Engineer. Prior to the start of any activity which will affect the pavement surface and require the placement of temporary striping, the Contractor shall show the Engineer proof that he has scheduled placement of the necessary temporary striping to ensure that the temporary striping can be completed prior to fully opening the roadway to traffic. The Contractor is responsible for maintaining the temporary markings in good condition such that the pavement is properly delineated at all times. The Contractor shall refresh the temporary pavement markings as required or as directed by the Engineer.

The Contractor shall apply temporary pavement markings in accordance with the requirements of Section 748 of the Delaware Standard Specifications and Part 3 of the Delaware MUTCD. Payment for temporary pavement striping shall be made at the unit price bid for the applicable temporary striping or symbol items. Payment for final striping will be included in the applicable striping item. Temporary pavement markings shall match the Plan dimensions and layout or the approved drawings of the "permanent markings" and shall be installed in accordance with Part 3 of the Delaware MUTCD. All conflicting striping is to be removed as directed by the Engineer according to the specifications for Item 748530 – Removal of Pavement Striping. Painting over the conflicting striping will not be accepted unless specifically allowed by the Plans.

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 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 devices, which includes cones, tubular markers, flexible delineator posts 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 (100 lbs.) or less, include Type 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 (100 lbs.), 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. Note that certification compliance to NCHRP Report 350 or MASH criteria is not required for Category IV devices.

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 bid price for "Maintenance of Traffic", for which price and payment constitutes full compensation for all maintenance of traffic activities accepted by the Engineer and for maintaining and/or relocating all temporary traffic control materials required, including submission of temporary traffic control plans, submitting certifications, ATSSA supervision (if required per the project plans), traffic cones, correction of edge drop-offs and for all labor, equipment, tools, and incidentals necessary to complete the item. Payment to furnish and maintain temporary traffic control devices (including, but not limited to plastic drums, temporary and permanent warning signs, portable P.C.C. safety barrier, truck mounted attenuators, variable message signs, arrow panels, temporary pavement markings and portable light assemblies) will be made at the contract unit price for each item. The cost to move temporary traffic control devices in accordance with the temporary traffic control plan or as necessary to address safety issue is included in this item.

NOTE:

If the Contractor does not complete the contract work within the contract completion time (including approved time extensions), the Contractor shall be responsible for providing the necessary temporary traffic control devices that are required to complete any remaining work. The cost 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

shall 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, portable light assemblies and portable impact attenuators.

7/19/2010

763501 - CONSTRUCTION ENGINEERING

Description:

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

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

The Engineer will only establish the following:

- (a) Original and final cross-sections for borrow pits.
- (b) Final cross-sections for all excavation items.
- (c) Line and grade for extra work added on to the project plans.

Equipment:

The Contractor shall use adequate equipment/instruments in a good working order. He/she shall provide written certification that the equipment/instrument has been calibrated and is within manufacturer's tolerance. The certification shall be dated a maximum of 9 months before the start of construction. The Contractor shall renew the certification a minimum of every 9 months. The equipment/instrument shall have a minimum measuring accuracy of [3mm+2ppmxD] and an angle accuracy of up to 2.0 arc seconds or 0.6 milligons. If the Contractor chooses to use GPS technology in construction stakeout, the Contractor shall provide the Engineer with a GPS rover for the duration of the contract. The GPS rover shall be in good working condition and of similar make and model used by the Contractor. The Contractor shall provide up to 8 hours of formal training on the Contractor's GPS system to a maximum of four Engineer's appointees. At the end of the contract, the Engineer will return the GPS rover to the Contractor. If any of the equipment/instruments are found to be out of adjustment or inadequate to perform its function, such instrument or equipment shall be immediately replaced by the Contractor to the satisfaction of the Engineer.

Engineering/Survey Staff:

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

Construction Methods:

Performance Requirements:

- (a) Construction Engineering shall include establishing the survey points and survey centerlines; finding, referencing, offsetting the project control points; running a horizontal and vertical circuit to check the accuracy of given control points. Establishing plan coordinates and elevations marks for culverts, slopes, subbase, subsurface drains, paving, subgrade, retaining walls, and any other stakes required for control lines and grades; and setting vertical control elevations, such as footings, caps, bridge seats and deck screed. The Contractor shall be responsible for the

preservation of the Department's project control points and benchmarks. The Contractor shall establish and preserve any temporary control points (traverse points or benchmarks) needed for construction. Any project control points (traverse points) or benchmarks conflicting with construction of the project shall be relocated by the Contractor. The Contractor as directed by the Engineer must replace any or all stakes that are destroyed at any time during the life of the contract. The Contractor shall re-establish centerline points and stationing prior to final cross-sections by the Engineer. The Vertical Control error of closure shall not exceed 0.05 ft times [Square root of number of miles in the level run] (0.01 m times [square root of number of kilometers]). The Horizontal Control accuracy ratio shall not exceed an error of closure of 1 foot per 20,000 feet (1 meter per 20,000 meters or 1:20,000) of distance traversed prior to adjustment.

- (b) The Contractor shall perform construction centerline layout of all roadways, ramps and connections, etc. from project control points set by the Engineer. The Contractor using the profiles and typical sections provided in the plans shall calculate proposed grades at the edge of pavement or verify information shown on Grades and Geometric sheets.
- (c) The Contractor shall advise the Engineer of any horizontal or vertical alignment revisions needed to establish smooth transitions to existing facilities. The Contractor shall immediately bring to the attention of the Engineer any potential drainage problem within the project limits. The Engineer must approve any proposed variation in profile, width or cross slope.
- (d) The Contractor shall establish the working points, centerlines of bearings on bridge abutments and on piers, mark the location of anchor bolts to be installed, check the elevation of bearing surfaces after they are ground and set anchor bolts at their exact elevation and alignment as per Contract Plans. Before completion of the fabrication of beams for bridge superstructures, the Contractor shall verify by accurate field measurements the locations both vertically and horizontally of all bearings and shall assume full responsibility for fabricated beams fitting and bearing as constructed. After beam erection and concurrently with the Department project surveyors, the Contractor shall survey top of beam elevations at a maximum of 10-ft (3.0-meter) stations and compute screed grades. These shall be submitted to the Engineer for review and approval before the stay in place forms are set. Construction stakes and other reference control marks shall be set at sufficiently frequent intervals to assure that all components of the structure are constructed in accordance with the lines and grades shown on the plans. The Contractor will be responsible for all structure alignment control, grade control and all necessary calculations to establish and set these controls.
- (e) The Contractor, using contract plans, shall investigate proposed construction for possible conflicts with existing and proposed utilities. The Contractor shall then report such conflicts to the Engineer for resolution. All stakes for advanced utility relocation, which will be performed by others, shall be paid for under item 763597 – Utility Construction Engineering.
- (f) The Contractor shall be responsible for the staking of all sidewalk and curb ramp grades in accordance with the plans and the Departments Standard Construction Details. The Contractor shall review the stakeout with the Engineer prior to construction. The Engineer must approve any deviation from plans, Department Standard Construction Details and Specifications in writing. The Contractor shall be responsible for any corrective actions resulting from problems created by adjustments if they fail to obtain such approval.
- (g) If wetland areas are involved and specifically defined on the Plans the following shall apply:
 - i. It is the intent of these provisions to alert the Contractor, that he/she shall not damage or destroy wetland areas, which exist beyond the construction

limits. These provisions will be strictly enforced and the Contractor shall advise his/her personnel and those of any Subcontractor of the importance of these provisions.

- ii. All clearing operations and delineation of wetlands areas shall be performed in accordance with these Special Provisions. Before any clearing operation commences the Contractor shall demarcate wetlands at the Limits of Construction throughout the entire project as shown on the Plans labeled as Limits of Construction or Wetland Delineation to the satisfaction of the Engineer.
- iii. The material to be used for flagging the limits of construction shall be orange vinyl material with the wording "Wetland Boundary" printed thereon. In wooded areas, the flagging shall be tied on the trees, at approximate 20-foot (6.1 meter) intervals through wetland areas. In open field and yard areas that have been identified as wetlands, 3 foot (one meter) wooden grade stakes shall be driven into the ground at approximate 20 foot (6.1 meter) intervals and tied with the flagging.
- iv. If the flagging has been destroyed and the Engineer determines that its use is still required, the Contractor shall reflag the area at no cost to the Department. If the Contractor, after notification by the Engineer that replacement flagging is needed, does not replace the destroyed flagging within 48 hours, the Engineer may proceed to have the area reflagged. The cost of the reflagging by the Engineer will be charged to the Contractor and deducted from any monies due under the Contract.
- v. At the completion of construction, the Contractor shall remove all stakes and flagging.
- vi. The Contractor shall be responsible for any damages to wetlands located beyond the construction limits, which occurs from his/her operations during the life of the Contract. The Contractor shall restore all temporarily disturbed wetland areas to their preconstruction conditions. This includes restoring bank elevations, streambed and wetland surface contours and wetlands vegetation disturbed or destroyed. The expense for this restoration shall be borne solely by the Contractor.

Submittals:

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

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

- (a) Proposed method of recording information in field books to ensure clarity and adequacy.
- (b) A printout of horizontal control verification, as well as coordinates, differences and error of closure for all reestablished or temporary Control Points.
- (c) A printout of vertical control verification, with benchmark location elevation and differences from plan elevation.

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

Method of Measurement:

The quantity of Construction Engineering will not be measured.

Basis of Payment:

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

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

8/29/07

763503 - TRAINEE

Description:

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

Basis of Payment:

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

5/2/02

763508 - PROJECT CONTROL SYSTEM DEVELOPMENT PLAN
763509 - CPM SCHEDULE UPDATES AND/OR REVISED UPDATES

Description:

The Project Control System will be set up and maintained by the Department of Transportation to monitor and record work in progress and to coordinate and synchronize construction management functions. The Department will use Critical Path Method (CPM) scheduling to approve the Contractor's work schedule, review work progress, evaluate time extensions, identify problem areas, and recommend solutions to maintain the established work schedule. The Department will designate a Critical Path Method Administrator (CPMA) to oversee the Project Control System.

The Contractor shall designate a Critical Path Method Coordinator (CPMC) having proven experience in construction scheduling and in CPM concepts and scheduling. The CPMC shall be familiar with and have direct contact with both the Contractor's front office and field staff. The CPMC shall be knowledgeable of the status of all parts of the work throughout the length of the Contract in order to properly coordinate the Contractor's work schedule information and shall be available for consultation and preparation of documents on a daily basis. If this condition is not complied with the Contractor shall submit qualifications for a replacement CPMC to the CPMA for approval by the Engineer.

The CPMC shall submit a working drawing schedule, materials schedule, crew schedule; and shall prepare and provide the "look ahead", original, update, revised update, and final (as-built) update CPM work schedules, written CPM schedule narratives, and other CPM schedule information as required by the Project Control System Development Plan. The CPMC shall prepare and provide the Contractor's work schedule information by email as a single compressed database file in CPM format fully compatible with the Windows® version of Primavera Project Planner® used by the Engineer for generation of the CPM schedules.

The CPM format shall be the Precedence Diagram Method with days as the Planning Unit and shall be based on Calendar Days. Schedules will be developed using every day as a workday; schedules with calendars based in any manner on Working Days will not be allowed. The CPMA will receive the Contractor's CPM schedule databases for input to generate the CPM schedules. The generated CPM schedules are the Contractor's own work schedule and will be reviewed for approval by the Engineer. The scheduling of the construction is the responsibility of the Contractor; the Contractor is responsible to determine, by adequate planning, the most feasible order of work commensurate with the Contractor's abilities and the Contract Documents.

The Contractor's compliance with the Project Control System Development Plan and CPM Schedule Updates and/or Revised Updates, and the Engineer's approval of the generated Original CPM schedule, its updates and/or revised updates will be required before processing monthly estimates for payment.

It is not the intent of this Contract that the Engineer by approving the CPM schedules agrees that it is reasonable in all respects or that the schedule, if followed, will result in timely completion of the Project. The Engineer's approval is based on a review of general conformity for compliance with the requirements of the Project Control System and on the items or time restrictions that the department and/or the Engineer have control. The Contractor is free to make assumptions regarding field conditions, estimated quantities, and/or subsurface conditions. However the Department's concurrence with the Contractor's schedule based on these assumptions does not relieve the Contractor from making necessary revisions to his schedule should his assumptions fail to hold true. No time extension to the Contract which is due to assumptions made by the Contractor and that do not hold true during construction will be considered by the Department. Discrepancies and/or changes initiated by the Department in proposed quantities or plans that cause an extension to the critical path will be considered by the CPMA. The Department's controls or time restrictions are identified hereinafter and in the Standard Specifications, Special Provisions, and on the Contract Plans as plan notes.

Development of the Project Control System (PCS):

The PCS development plan is as follows:

- (a) Within seven (7) calendar days after the date of the fully executed Contract a workshop meeting will be held with the Engineer, CPMA, Contractor, and CPMC. The CPMA will

profile the basics and procedures of the Project Control System and discuss schedule model design at this meeting. Attendance is mandatory,

The Department's partially predetermined Coding Structure (CS) format having a maximum of seventeen (17) code classification levels will be used and will be furnished at the Workshop Meeting. The CS is a specific listing that illustrates the hierarchy of work needed for the project. The hierarchy is categorized into levels or classifications. The CS classifications organize activities into manageable groups through each level of the project, for example; locations, phasing (staging), landmark dates, roadway sections and bridge structures; footings, columns, and caps; contractor and subcontractor.

The CPMC shall assist in determining the breakdown and code title descriptions from south to north and west to east of the location code classification. Activity code values shall be perspicuous for each classification grouping. Additional activity code classifications and values as required by the Engineer from time to time shall be provided and added to the schedule database by the CPMC. The CPMC shall not alter the CS and properly code all activities with the approved CS activity code values for all code classifications including all railroad, waterway, and outside agency activities with approved code values, including classifications as added by the Engineer. Coding enables generation of organized reports and graphics that can summarize any level of the project schedule.

When the Department provides a format database for the Contract, it shall be used by the Contractor as the basis from which to develop their schedule. The CPMC may add, but not insert, code classifications in the format database;

(b) Within fourteen (14) calendar days after the workshop meeting, the CPMC:

- (1) Shall submit a working drawing schedule, using the Department's application format or other format as agreed to by the Engineer. This schedule shall also include all other items having content that requires approval to allow any portion of the work to commence or continue. This schedule shall be submitted to the CPMA for approval by the Engineer and shall contain all required working drawings and also include but not be limited to reinforcing bar lists, formwork drawings and calculations, construction procedures, borrow pit security and traffic plans, precast structures, wetland work plans, construction sequencing, load tests, and wave equation analyses. Working drawing information shall include the identification number, description, type, anticipated submittal date, time frame for preparation and review, approval needed by date, and a resubmittal process (if expected) for each listed item. This information shall also give factory leadtime and expected delivery date, if applicable, for each listed item.

The Contractor should be aware that the Department's time frame for review of working drawings and other submittals properly submitted or resubmitted in accordance with Standard Specification Subsection 105.04 will be thirty (30) calendar days duration unless mutually agreed to by the CPMC and CPMA; this 30 day duration supercedes the time frame of the Subsection. If a working drawing or other submittal involves review by a railroad, environmental agency, municipality, federal agency, or the U. S. Coast Guard the time frame for review will be sixty (60) calendar days unless mutually agreed to by the CPMC and CPMA. The time frame will begin on the date of receipt of the drawings by the reviewer and will end on the date of transmittal returning the drawings to the Contractor by the Department. No drawings will be accepted for review until an initial working drawing schedule has been accepted unless agreed to by the Engineer.

The working drawing schedule shall be updated and correlated with the activities of the "look ahead" and all other CPM schedules;

- (2) Shall submit a materials schedule using the Department's application format or other format as agreed to by the Engineer. This schedule shall be submitted to the CPMA for approval by the Engineer and shall contain all required materials, samples, and sources of supply. The materials schedule information shall include

the identification number, description, generic or brand name, sample requirement, and manufacturer's and supplier's name, address, and phone number for each listed item. The schedule shall also give the anticipated submittal date, time frame for preparation and review, approval needed by date, factory leadtime, and expected delivery date, if applicable, for each listed item.

The materials schedule shall be updated and for materials having long factory leadtimes shall be correlated with the activities of the "look ahead" and all other CPM schedules;

- (3) Shall submit a crew schedule. This schedule shall be submitted to the CPMA for approval by the Engineer and shall be accompanied by a written narrative and shall contain all crews and their work plan.

The crew schedule shall be updated and correlated with the activities of the "look ahead" and all other CPM schedules;

- (4) Shall prepare and provide a written narrative of the Contractor's work plan and an acceptable "look ahead" schedule database in CPM format. This schedule database shall reflect activities for the Contractor's overall work plan for the entire project detailing the "look ahead" period and shall be submitted to the CPMA for acceptance by the Engineer. The "look ahead" period shall be as determined by the Engineer. The "look ahead" schedule shall be maintained and updated until an Original CPM schedule is approved. The "look ahead" schedule shall also reflect the Sequence of Construction in the plans unless otherwise approved by the Engineer. This "look ahead" schedule, its updates and/or revised updates shall also be incorporated into the Original CPM schedule database. Issue of the Notice to Proceed is contingent upon receipt and acceptance of this schedule in accordance with Standard Specification Subsections 108.02 and 108.03; and

- (5) Shall begin meeting with the CPMA at their office every third business day to prepare and provide a written narrative of the Contractor's work plan and a CPM schedule database until a useable, logical draft of the full CPM schedule network, responsive to the project requirements and correlated with the required schedules has been developed as determined by the Engineer. The CPMA will generate an initial CPM schedule from the CPMC's logical draft CPM schedule database for review by the Engineer. This initial schedule shall reflect the Sequence of Construction in the plans unless otherwise approved by the Engineer. This initial CPM schedule database, if acceptable, may be used to fulfill the Contractor's "look ahead" schedule requirements;

- (c) If the initial CPM schedule is not acceptable to the Engineer, the CPMC shall continue to meet with the CPMA on every third business day and prepare and provide the Contractor's written narrative and CPM schedule database as necessary until a generated CPM schedule is acceptable to the Engineer; and

- (d) Within twenty-eight (28) calendar days after the workshop meeting, an initial CPM schedule must be generated having the requirements for the Engineer's approval. This schedule shall reflect a clear understanding of the Contractor's work plan, be adequate to determine the Department's staffing requirements, have correct physical logic, incorporate construction and traffic phases, and display clarity of presentation for review and processing. Upon approval the CPMA will furnish the Contractor a graphic and report output of this CPM schedule. This CPM schedule, or Original CPM schedule, is the Contractor's own work schedule and the Contractor's responsibility to maintain.

The ending (cut-off) day for each monthly estimate period shall be proposed by the Contractor subject to Department approval. In the event of a conflict, the Engineer will have the authority to establish the ending day.

Processing of monthly estimates for payment will begin or continue only if the Contractor is in compliance as determined by the Engineer with the PCS Development Plan.

Any information required by the Engineer for analysis of the CPM schedules, their updates and/or revised updates; clarification of charts and other schedules; and evaluation of proposed changes or change orders shall be prepared and provided by the CPMC. A copy of the current approved CPM schedule, its updates and/or revised updates shall be on display at the field office of both the Department and the Contractor.

CPM schedule information and requirements:

The CPMC shall prepare and provide the Contractor's work schedule information in the form of work step and restraint activities:

- (a) Work step activities are single step construction elements,
- (b) Restraint activities are not construction elements but affect the start of other activities.

When setting forth work steps and restraints the breakdown on these activities shall address the following factors:

Work Step factors affecting the duration and/or sequence of activities;

- 1. Work at locations done at different times or requiring different crews,
- 2. Work requiring different materials,
- 3. Work requiring different crew or craft requirements,
- 4. Work requiring different equipment,
- 5. Work requiring different responsibility (subcontractors),
- 6. Structural work having distinct subdivisions,
- 7. Labor and equipment resource availability,
- 8. Work as reflected in the Contractor's estimating or accounting breakdown,
- 9. Work as reflected in the state's breakdown for bidding or payment,
- 10. Public, private, and/or Contractor utility work and limiting or outage schedules of public and/or private utility organizations, and
- 11. Maintenance of traffic.

Restraint factors affecting the start of other activities;

- 1. Preparation of working drawing and materials submittals,
- 2. Approval, return, and/or resubmittal of working drawings and materials,
- 3. Specialized material testing,
- 4. Long lead purchases - material and equipment availability,
- 5. Material and equipment fabrication time,
- 6. Testing of special equipment and in place testing,
- 7. Delivery of unusual shipment or scarce material,
- 8. Dependency on completion of utility work,
- 9. Dependency on the Department's approval of issues involving public, private, and/or other governmental agencies,
- 10. Dependency on completion of part or all of another Department contract or construction of other organizations, whether contiguous or not,
- 11. Protection and restoration of property, forest protection, special traffic controls, erosion control and water pollution, environmental controls and suspensions, safety, and foreseeable archeological and/or historical evidence delays,
- 12. Procurement of permits, and
- 13. Conditions as set forth in Standard Specification Subsection 107.01.

Activities must be identified by a name, symbol, and coding, and shall have duration, sequence, responsibility, and resources.

Activity names or titles shall be descriptive and be single identifiable work steps or restraints. A sample breakdown list of activity titles may be furnished to the Contractor by the Engineer on request. Activities shall be selected, as a minimum, on a structure by structure and/or section by section basis where relevant and have further breakdown into secondary components. Activities shall be inclusive and representative of the Contract work. Activity symbols, or ID's, shall be unique and systematic.

Activity codes shall have classifications and values. The approved CS will determine activity code

classifications and values. The CPMC shall identify activities using these classifications and code values. Additional activity codes as required by the Engineer shall be provided by the CPMC.

Activity durations, or Original Durations, shall be reasonable and representative of the scope of the activity. If durations are considered excessive or insufficient, the industry standard will be used. Original Durations may not exceed thirty (30) calendar days unless approved by the Engineer. Durations of activities shall be determined by using productivity rates based on calendar days, not work days. Original Durations of activities may not be less than two (2) calendar days unless agreed to by the CPMA. The use of calendar day productivity rates in CPM scheduling allows for customary days during the work week that the Contractor does not work and for normal weather delays. Productivity rates used to establish durations shall reflect the time periods when work can be scheduled and exclude the non-work period of the activity's calendar. Calendars allow activities to be scheduled only when allowed by the nature of or restraints on the work. Calendars shall not exclude weekends, holidays, or other times the Contractor does not work. All activities shall be identified by entry of their appropriate Calendar. A minimum of seven (7) shall be used and the first seven (7) shall be ordered and entitled as follows: 1) Full schedule, 2) Winter condition, 3) Concrete Paving, 4) Asphalt Base, 5) Asphalt Super Pave, 6) Asphalt SMA, and 7) Environmental. Calendar non-work periods shall reflect the Delaware weather history of and the environmental regulations for the location of the Contract work and shall be as agreed to by the Engineer.

Activity durations are based on Calendar Days and shall reflect all time necessary to complete an activities work and its requisites. The Contractor shall include in their original schedule narrative their work day to calendar day conversion factors with a discussion of how these factors were determined. When scheduling using multiple resources each resource unit shall have a corresponding activity. All time to complete the activity shall include as a minimum all Contractor unscheduled work days, all Contractor holidays, and allowance for normal weather delays, except for software generated calendars. Inclement weather and failure of a contractor and their subcontractors to provide sufficient resources are not means to recover costs or time due to delay.

Activity sequence shall be typical of proficient scheduling practice. The sequence must be logical and representative of the Contractor's order of the work. Successors and predecessors determine the job logic or activity sequence. Successors are activities that follow an activity. Predecessors are activities that precede an activity. A given activity cannot start until all predecessors have been completed. The Precedence Diagram Method (PDM) shall be used. The PDM places the activities on nodes and the dependencies between them are defined by arrows. Only finish to start dependency relationships (links) shall be used; lag times may not be used unless approved by the CPMA. The Department reserves the right to request a resequencing of activities to effect competent scheduling practice and realistic job logic.

Activities shall be sequenced to reflect resource apportionment. When one crew (resource) is being utilized to perform all of many similar activities, these activities must be linked together in some sequence to reflect that one crew is performing the work. Additionally, when several crews are performing similar activities, these activities must have separate linked sequences equal to the number of crews performing the work. Activities shall be logically connected and coded to reflect the crew (resource) performing the operation. A summary list of crews, their crew codes, and their operation(s) shall be included with each schedule submission unless unchanged. Resource loading will not be required unless otherwise directed by the Engineer. If resource loading is directed, payment will be incidental to the Item 763509 - CPM Schedule Updates and/or Revised Updates.

Activity responsibility shall be identified for each activity except those performed by the Contractor, if requested by the Engineer. Subcontractors, DBE's, utilities, performers of other contracts, and performers of adjoining work on other advertised contracts shall be identified by coding when responsibility for an activity is requested.

Activity resource loading shall be required only if the Contractor demonstrates the inability to maintain the CPM schedule. In this event, the Engineer shall have the authority to require resource information for all activities affecting project completion. Resource information includes manpower, equipment, materials, and/or services and has cost and has a range and amount of availability. Lack of sufficient resources will not be considered cause to extend durations when preparing the CPM schedule. By bidding to contract the work, the Contractor has ensured that sufficient resources are available or will be available in a suitable time frame to perform the work within the Contract Time, even if a resequencing of activities requires an activity or activities to shorten their Remaining Duration. In the event the Contractor demonstrates the inability to maintain the CPM schedule, the Engineer may require the Contractor to increase the number of shifts, begin

overtime operations, work extra days including weekends and holidays, supplement construction plant and equipment, or all or any of the foregoing as a step to improve the Contractor's work progress all without additional cost to the Department.

Work activities shall as a minimum be representative of all construction work for each operation, each phase (stage), and each location.

Working drawings requiring submittal shall be included as activities. Preparation, approval, and leadtime (order, manufacture, and delivery time), shall be included as activities for each applicable working drawing item. A separate activity shall be used to begin the submittals of working drawings. Working drawing activities shall not be on the critical path of the original CPM schedule. Time extension(s) will not be considered when submittal activity(s) affects the critical path except for owner caused delay as recognized by the Engineer. If working drawings require resubmittal(s), activities for their preparation and activities for their approval (having the Department's review time) shall be included in the next CPM schedule update database. Time extension will not be considered when resubmittal activity(s) affects the critical path except for owner caused delay as recognized by the Engineer. Working drawing activities and leadtime activities not requiring submittal shall not be on the critical path of the Original CPM schedule.

Materials having long leadtime and/or manufacture time or that are difficult to acquire and/or fabricate shall have materials approval and leadtime activities included in the schedule for each applicable material item. A separate activity shall be used to begin the submittal of these materials. These material approval and leadtime activities shall not be on the critical path of the Original CPM schedule.

Administrative milestones shall be included as activities. Each milestone of the bidding through first chargeable day process shall be an activity.

Utility work shall be included as activities and shall be identified accordingly. Each utility item on the plans or listed in the Contract's Utility Statement shall be an activity. The activity description shall indicate the utility company and include the number of each listed item or be numbered according to the item's order in the Utility Statement. A separate activity shall be used to begin utility work. Utility activities shall not be impactful on the Original CPM schedule unless authorized by the Engineer.

Agency agreements and/or arrangements and other submittals for approval shall be included as activities. A separate activity shall be used to begin the agency items and other submittals for approval.

The effect of other Department contracts or construction of other organizations on the completion of part or all of this Contract shall be included as activities. A separate activity shall be used to begin these items.

Phasing (staging) shall be included as activities. These activities shall be correlated with the sequence or suggested sequence of construction on the plans and/or in the specifications. A separate start or finish milestone activity shall be used to start and to complete each phase.

When multiple crews are performing an operation or a string of operations, each crew shall be logical connected and coded to reflect the crew performing the operation.

Surcharge durations and special testing, if applicable, shall also be included as activities. Sufficient duration times for these activities will be allowed as per the plans and specifications or as agreed to by the Engineer.

Activity types must be either "task", "start milestone", or finish milestone. "Hammock" type activities may be allowed as agreed to by the Engineer. If the Department requires resource loading, "task" activities may be converted to "independent" type as agreed to by the Engineer.

Date constraints, float and duration constraints, and/or flags for activities will not be allowed. Milestones that do not constrain the schedule shall be allowed as agreed to by the Engineer when unique or unusual events cause a restraint to the Contractor's work schedule. The use of "Start No Earlier Than" (SNET) and "Zero Free Float" (ZFF) constraints for activities may be allowed for the purpose of schedule clarity or definitude if acceptable to the CPMA.

Total Float is defined as the difference between the current schedule finish date and the Contract Completion Date that is entered by constraint ("Project must finish by:" date) in the schedule.

Free float is defined as the amount of time between when an activity "can finish" (the early finish) and when an activity "must finish" (the late finish). Free float is float shared with all other activities and is defined as the amount of time an activity can be delayed without affecting the critical path of the schedule. It shall be understood by the Contractor and the Department that free float is a shared commodity, not for the exclusive use or financial benefit of either party. Either party has the full use of the free float until it is depleted.

The critical path is defined as the series of activities in a CPM schedule network that has the longest path in time. The submitted activity sequence and durations must generate a CPM schedule having only one (1) critical path; a schedule with multiple or near multiple critical paths will not be allowed. Work like project wide Maintenance of Traffic, Construction Engineering, or Temporary Erosion Control that by their nature are ongoing for long durations or the duration of the project and are basically complementary to other activities, shall be divided and condensed into "establish" and "conclude" activities to prevent this type of work from being the major portion of the critical path or its entirety.

The Project Start Date, or initial Data Date, of the Original CPM schedule shall be the first chargeable day of work. The first schedule activity related to productive work shall be entitled "First Chargeable Day" and shall be a start milestone. Nonproductive work and administrative activities may begin and/or end prior to the Project Start Date and shall be stated as such in the Original CPM Schedule. The submitted activity sequence and durations must generate an Original CPM schedule using all the Contract Time and a critical path having zero total float. An early completion schedule will not be allowed. The Contractor's original schedule shall reflect the use of the entire Contract Time. The schedule ending date that uses all the Contract Time in the Original CPM schedule will be the original Contract Completion Date. This Contract Completion Date shall be fixed (Project must finish by:) in the Original CPM schedule and shall remain unchanged unless a time extension is awarded.

The Contractor's Original CPM schedule shall allocate the work over the entire Contract Time. The Contractor shall not anticipate early completion in bid preparation and shall distribute all time-driven and/or time-dependent costs uniformly over every day of the Contract Time when preparing the bid. No early completion schedules will be accepted.

After the Original CPM schedule utilizing all the allocated Contract Time has been approved, job conditions or logic changes may occur which require revision to the schedule. Only an update may be revised. These revised updates must be reflective of the Contractor's actual intent in constructing the project. The revision may cause the project completion date to be earlier than the completion date of the current approved schedule. This is acceptable to the Department; but no claims will be considered for time-driven and/or time-dependent costs (such as delay and/or extended overhead expense) which are a result of not meeting this new project "early finish" date. Consideration for these costs would occur only for approved extensions that force actual project completion past the originally advertised Contract Time including authorized time extension(s). However, no credits for non-expended overhead will be requested should a Contractor successfully achieve completion of the project prior to the use of all the Contract Time.

If the project is delayed, the contractor must demonstrate the inability to perform other critical or near critical work to receive consideration for an extension of Contract Time.

CPM schedule databases shall be calculated using the relevant Data Date prior to submittal to the CPMA. The Data Date of CPM schedule updates and revised updates shall be the next day after the end of the update period. Schedule calculations of CPM databases shall be based on retained logic, contiguous durations, and total float as finish float.

Activity Log (memo) information is allowed, but must be factual; shall be removed, if redundant; and shall not be masked, but indicated for printing to output reports. Punctuation is not required for activity and Activity Log information unless necessary for clarity.

Statusing or contract progress of activities for updates is the entering of Actual Start dates, Suspend Date(s), Resume Date(s), Actual Finish dates, and changes in Remaining Durations to the database. An activity's Original Duration may not be changed. An activity that begins (has an Actual Start Date) must have its Remaining Duration reduced by at least 1 day.

Activity Suspend and/or Resume Dates shall be added to the activity record and the factual reasons for the cause shall be added to the respective activity Log. If an activity is suspended again it shall be curtailed

and assigned an Actual Finish Date equal to the latest suspension date, and a new activity (portion 2) comprising the balance of remaining duration shall be created and inserted in succession; both activities shall indicate by log comment the facts causing this condition.

Log statusing shall be used when an activity has out-of-sequence progress and no Actual Finish Date. Out-of-sequence progress occurs when any previous predecessor of an activity has no Actual Finish date. Log statusing is the entering of the Actual Start date to the Activity Log of the database in the Departments format. These entries are not to be masked, but indicated for printing to output reports. Changes in Remaining Durations shall be entered to the database but not the Activity Log. When progress is no longer out-of-sequence or all previous predecessors of the activity have Actual Finish dates, the activity's Actual Start shall be taken out of log status and entered to the database. Log statusing provides schedule output that prevents graphic distortion of schedule activities and preserves the design sequence of the CPM schedule plan. The Engineer shall have the authority to require a revision of the CPM schedule because of out-of-sequence progress. A suspended activity that requires log statusing shall be treated in the same manner as though it was suspended again.

Each original, update, and revised update schedule database and subsequent draft submitted for approval shall have a unique and manifest Project Name and shall be uniquely identified by entry (Number/Version) in the schedule database.

Corrections are defined as entries to the database that rectify coding and activity identification errors. Corrections shall be identified by written narrative and/or as agreed to by the CPMA. Exception(s) taken in PCS or other Department correspondence shall be complied with in the subsequent update and/or a revised update of the CPM schedule.

Written narratives shall be included with each submission of initial or revised update databases. The narratives must conceptualize work plans, modifications, and/or corrections but may be summary unless otherwise directed by the Engineer. These narratives shall describe where and the crews and order of what is to be done; narratives that are a listing of the work will not be acceptable. The Department will only accept schedule databases that reflect the work plans, modifications, and/or corrections reflected by their respective written narratives.

Inaccurate and/or faulty databases of any CPM schedule update and/or revised update will be unacceptable and shall be summarily corrected and resubmitted. Resubmittals shall be labeled "2nd Draft", "3rd Draft", etc. as appropriate and identified by entry (Number/Version) in the schedule database.

Any activity(s) or activity information that is necessary to generate a CPM schedule acceptable to the Engineer and/or schedule information that is requested by the Engineer shall be prepared and provided by the CPMC.

The CPMA will generate the CPM schedule network reflecting the Contractor's scheduling information. Upon approval of the Original CPM schedule and subsequent CPM schedule updates and/or revised updates, the CPMA will furnish the Contractor graphic and report outputs of these schedules. These CPM schedules are the Contractor's own work schedule and the Contractor's responsibility to maintain.

Monthly CPM Schedule Updates:

The CPMC shall meet with the Contractor and Resident Engineer and prepare the required work schedule progress information (status reports) to update the CPM schedule. This information shall be submitted on status forms provided by the Department that are generated from the Original Schedule and thereafter from the previous CPM schedule update or revised update(s). This update information shall reflect the current state of completed project work. The update information shall include all activities on which work was performed and/or there was progress during the update period and shall include as a minimum their actual start dates, suspend dates, and resume dates; and the estimated remaining durations or actual finish dates. The update information shall be as agreed to and signed off and dated by the Resident Engineer and the CPMC. The CPMC shall use the signed off and dated information to status and/or log status the update database.

The Contractor shall submit the CPM schedule database update and a copy of the signed off update information within five (5) calendar days after the end of each monthly update period. The database and signed off information must match. The CPMA will generate a CPM schedule update reflecting the Contractor's update information. The five (5) calendar day submittal period will enable the Department to

discuss current schedule information at the monthly progress meeting held the following week.

If the critical path of the generated CPM schedule update has less than minus ten (-10) calendar days of total float the CPM schedule update shall be revised.

Upon approval of the CPM schedule update, the CPMA will furnish the Contractor a graphic and report output of this update. This CPM schedule update is the Contractor's own updated work schedule and the Contractor's responsibility to maintain.

CPM Schedule Revised Updates:

The CPM schedule shall be revised if the critical path has less than minus ten (-10) calendar days of total float, conditions require the Contractor to modify the work schedule, the Contractor chooses to make a significant change in the sequence of work, or the Department requests the schedule to reflect the current state of the work and/or the Contractor's acknowledged work plans. The revised update shall reflect the Contractor's current order of work and include new and/or previous activities affected by the change and shall include a written narrative of these changes. Revision as required by this Specification or as requested by the Department does not constitute acceleration unless agreed to by the Engineer. Revisions shall be identified as the revised update of the current approved CPM schedule update. Revisions are to be singular in modification and not lumped together in the same revised update unless otherwise directed by the Engineer. Additional revision(s) of the same update is therefore acceptable. The Department reserves the right to request a resequencing of activities to effect a completion date within the Project Time.

The CPMC shall meet as needed with the CPMA at the Engineer's office within five (5) calendar days after revision is required, formal request for a revision, or the Contractor announces intent to submit a revision. The purpose of the meetings shall be to prepare the Contractor's revised update CPM schedule database and its written narrative of changes. These meetings shall continue until a useable, logical draft of the revised update CPM schedule network, responsive to the modification requirements, has been developed that will generate a workable, CPM schedule revised update having a completion date using or within the Contract Time or that allowable by this specification. The submitted CPM schedule database revised update must reflect its written narrative. Revised updates inconsistent with their written narratives will not be acceptable. The CPMA will generate the CPM schedule revised update reflecting the Contractor's new information. The reports generated by the CPM schedule revised update shall be used to prepare the update information for the next CPM schedule update.

Reduction of activity durations will not be considered acceptable criteria for revision to bring the project back on schedule unless activity quantities have been reduced or the Contractor provides a narrative describing how their means and methods to construct the work shall change and/or their resource allocation to perform the work shall increase.

For activities using like resources, modification of activity relationships to be concurrent (run parallel) with each other will not be considered acceptable criteria for revision to bring the project back on schedule unless the Contractor provides a narrative describing how their crews and/or resource allocation to perform the work shall increase.

A CPM revised update having the requirements for the Engineer's approval must be completed before preparation of the next CPM schedule update. Processing of the next monthly estimate for payment will begin only after the Engineer's approval of the signed CPM schedule revised update.

Upon approval of the CPM schedule revised update, the CPMA will furnish the Contractor a graphic and report output of this revised update. This CPM schedule revision is the Contractor's own revised work schedule and the Contractor's responsibility to maintain.

In the event that the Contractor fails to maintain his CPM schedule in a satisfactory manner, the Engineer reserves the right to enforce the provisions as set forth in Standard Specification Subsection 108.10.

Change Orders and adjustment of completion time:

A Change Order will only be considered for extension of Contract Time when the modified critical path shows requirement of additional time because of the added activity or activities and/or there is justifiable delay as recognized and determined by the Engineer. For any change order that affects the schedule, the

Department reserves the right to request a resequencing of activities to effect a completion date within the Project Time.

If the CPM schedule has been updated and/or revised and positive total float has been created, no additional time will be given for added activity(s) unless the modified critical path shows requirement of additional time and/or there is justifiable delay as recognized and determined by the Engineer. Compensation for additional overhead costs will not be considered until all of the original Contract Time has been utilized. The Engineer reserves the right to "bank" (postpone the award of) approved time extensions if the project is ahead of schedule.

If a change order represents issues for which the effect on Contract Time can be readily determined, then any time adjustment will be agreed upon by the CPMC and CPMA prior to final execution of the change order. Determination of time adjustment will be based on the effect of the issue on the CPM schedule, the current approved CPM schedule update or approved CPM revised update, and the Department's Time Evaluation Worksheet (TEW) submitted by the Contractor.

However, if the issues represented by the change order require further analysis and review in order to accurately and fairly evaluate the effect on Contract Time, then the change order contract time assessment block may be marked "not considered at this time". This will be done in order to not delay payment to the contractor for completed work included on a particular change order while the time analysis is being performed. In these cases, final resolution of any time related issues would be made as soon as all required information is received and analyzed by the Department and the Contractor.

After signature by all parties, the change order is considered approved, and work activities and any time modifications as shown on the approved TEW that affect the CPM schedule shall be reflected in the next CPM schedule update or revised update and be documented by written narrative. Only activities on the approved TEW may be included as activity(s) in schedule databases. Updates reflecting change order(s) that are inconsistent with their change order narratives will not be acceptable. No change orders will be processed until their effect on the CPM schedule has been determined, unless otherwise approved by the Engineer. A change order may not be included in a monthly estimate for payment unless approved by the Department on or before the cutoff date of the estimate. All official time extensions will be granted by letters from the applicable District Construction Engineer or his/her designated representative.

Issues involving potential time extensions must be addressed in the CPM schedule update period in which they occur or they cannot be considered. If the Contractor proposes a change to the Contract work, any time the Contractor spends in discussion and preparation, and any time the Department requires for review in the approval or disapproval process for this proposed change to the Contract work will not be considered for granting of additional Contract Time. It is the obligation of the Contractor to complete the project on time according to the original contract documents including current approved changes notwithstanding any change submitted for approval that may or not be accepted. The Contractor is obligated to prosecute the work at any time according to the Contract Documents in covenant at that time.

If an allowance for weather days has been included in the Completion Date section at the beginning of the Contract Special Provisions, these days shall be identified as Contract Weather Days. The following definitions regarding weather days will be utilized:

Weather day – Any Calendar Day (including weekends and Holidays) on which a weather event prohibit contract work on critical path activities. Events include, but are not limited to rain, snow, or extreme temperatures.

Lost day – Any Calendar Day (including weekends and Holidays) on which residual effects from a weather event prohibit contract work on critical path activities. Examples include, but are not limited to, wet conditions from a previous rain event, snow cover, or frozen ground.

Extensions of Contact Time for weather will not be considered until the total of weather days and lost days as defined above exceed the number of Contract Weather Days as listed in the Completion Date section at the beginning of the Contract Special Provisions. The Contractor and the Department will record and agree on weather days and lost days. A day will be considered a weather or lost day if it prevents progress of the current or next work activity on the critical path of the schedule. A day will not be considered a weather or lost day if it occurs during a calendar non-work period of the current or next work activity on the critical path of the schedule. Weekends and holidays will also be excluded from consideration for weather and lost days

during calendar non-work periods.

When the total of weather days and lost days recorded in the field exceed the advertised Contract Weather Days, the Contractor will be awarded a day for each day weather or conditions due to previous weather events prevent progress of the current or next work activity on the critical path of the schedule. When weather affects an activity not on the critical path and the activity becomes the critical path, the allowable days of time extension will be only for the days the activity was on the critical path. The Contractor and the Department will record and agree on these weather days. Inability to prosecute work not shown as activities in progress on the most recent CPM schedule will not be considered when determining an extension of Contract Time. The Engineer will have the final decision as to the number of calendar days the Contractor's work was limited to because of weather.

Final (As Built) CPM Schedule Update:

The CPMC shall meet with the Contractor and Resident Engineer and prepare the required as-built work schedule information and corrective work schedule information to finalize the CPM schedule. The progress reports generated by the previous CPM schedule update or revised update will be used to prepare this update information. This final update information shall reflect the final state of the project work. The final update information shall include all activities on which work was performed and/or corrections since the last update period and shall include as a minimum the activity ID and title, the actual start and finish dates, and the actual completion date. The final update information shall also include any revisions and change orders not previously included in the CPM schedule. These correction, revision, and change order modifications shall be reflected by a final update written narrative. The final update information will be as agreed to and signed off by the Resident Engineer and the CPMC. The CPMC will use the signed off information to status the CPM schedule database to prepare the final update schedule.

The Contractor shall submit the final CPM schedule database and a copy of the signed off final update information within five (5) calendar days after formal request for this update. The database and signed off information must match. The CPMA will generate a final CPM schedule update reflecting the Contractor's new information. Upon approval of the final CPM schedule update, the CPMA will furnish the Contractor graphic and report outputs of this final update.

The CPMC shall submit two (2) signed copies of the final CPM schedule update to the CPMA. Processing of the final estimate for payment will begin only after these signed copies are received. This final (as built) CPM schedule is the Contractor's final work schedule.

Method of Measurement:

The Project Control System will be portioned into two (2) items. The item, "Project Control System Development Plan", will be bid price lump sum. The item, "CPM Schedule Updates and/or Revised Updates", will be unit bid price per each approved update.

Basis of Payment:

The item, "763508 - Project Control System Development Plan", will be paid for at the Contract lump sum bid price, on the next monthly estimate after completion of the requirements of the Project Control System Development Plan, which includes approval of the Original CPM schedule.

The item, "763509 - CPM Schedule Updates and/or Revised Updates", will be paid for at the Contract unit bid price per each approved CPM schedule update. Revised updates are incidental to this item, except that each revised update(s) requested by the Department for purposes of incorporating Plan Revisions will be paid as one (1) approved CPM schedule update.

9/17/08

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

763593 - MODIFICATIONS TO TRAFFIC BARRIER GATE

Description:

This work consists of furnishing materials and making retrofit modifications to existing traffic barrier gate arm assemblies in accordance with this specification and the notes and details on the Plans.

Materials and Construction Methods:

Gate arms shall be constructed from a combination of fiberglass and 6005-T5 aluminum tubing, with length to match existing gates. Gate arms shall be equipped with a shear pin and hinge such that application of excessive force will cause the arm to swing away from traffic. Arms shall be fully covered with 16 inch alternating red-and-white engineering grade reflective sheeting. Side arm channels shall be steel, hot dip galvanized after fabrication. Truss cables and bumper rods shall be included as indicated on the plans, or when required as determined by the manufacturer. Truss cables shall be stainless steel.

Gate arm counterweights shall be adjusted to properly counterbalance the retrofitted gate arm or shall be new construction of steel, hot dip galvanized after fabrication. New counterweights shall be bolt-on type and sectionalized to permit field adjustment.

Warning lights shall be located on the gate arms as indicated on the plans. Light housings shall be of weatherproof construction with fully potted electronics. Lights shall be wired to alternately flash when the traffic signals are red or any time their associated gate arm is not fully raised. Lights shall continue flashing until gate arms are fully raised and traffic signals are green.

The construction methods shall be as recommended by the manufacturer.

Method of Measurement:

The quantity of traffic barrier gate modifications will not be measured.

Basis of Payment:

The quantity of traffic barrier gate modifications will be paid for at the Contract lump sum. Price and payment will constitute full compensation for fabricating, furnishing and installing all materials, removing and disposing of the gate components being replaced and for all labor, tools and equipment necessary to complete the work.

4/5/11

763602 - BIRD CONTROL

Description:

This work consists of furnishing, fabrication, and erecting all elements for the purpose of keeping pigeons out of the bascule piers in accordance with notes and details on the Plans, and directions from the Engineer.

Materials:

Netting and connections shall be as manufactured and/or specified by Bird Barrier America, Inc. of Carson California, Bird - X of Chicago Illinois, or an approved equal for the specific purpose of keeping pigeons out of the bascule piers.

Construction Methods:

As indicated on the Plans and per the manufacturers recommendations.

Method of Measurement:

The quantity of pigeon proofing will not be measured.

Basis of Payment:

The quantity of pigeon proofing will be paid for at the Contract lump sum. Price and payment will constitute full compensation for furnishing all materials, fabricating frames and installation and for all labor, equipment, tools and incidentals required to complete the work. Any pigeons that enter the bascule pier prior to the pigeon control being installed shall be removed in a humane manner. No additional payment shall be made for such pigeon removal.

4/6/11

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



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

CAROLANN WICKS, P.E.
SECRETARY

UTILITY STATEMENT

STATE CONTRACT No. T201007405
F.A.P. No. EBHN-2010(29)
Project I.D. No. 09-01801
BR1-687, 1-688, 1-693; South Walnut Street,
South Market Street & Fourth Street over Christina River

NEW CASTLE COUNTY

Any adjustments and/or relocations of existing utility facilities shall be accomplished by the respective companies' forces as construction warrants.

Any adjustments and/or relocations of municipally owned sewer or water facilities shall be done by the State's contractor in accordance with the respective agencies' standard specifications as directed by the District Engineer.

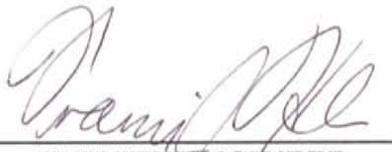
General Notes

1. The Contractor's attention is directed to Section 105.09 Utilities, Delaware Standard Specifications, August 2001. The Contractor shall contact Miss Utility (1-800-282-8555) two working days prior to any excavation. The Contractor is responsible for the support and protection of all utilities when excavating. The Contractor is responsible for ensuring proper clearances, including safety clearances, from overhead utilities for construction equipment. The Contractor is advised to check the site for access purposes for his equipment and, if necessary, make arrangements directly with the utility companies for field adjustments for adequate clearances.
2. 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.

3. Coordination and cooperation among the Utility Companies and the State's Contractor are of prime importance. Therefore, the Contractor is directed to contact the following Utility Company representatives with any questions regarding this work prior to submitting bids and work schedules. Proposed work schedules should reflect the Utility Companies' proposed relocations. The Utility Companies do not work on weekends or legal holidays.

DIVISION OF TRANSPORTATION SOLUTIONS

2-22-11
DATE


UTILITY ENGINEER

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

CERTIFICATE OF RIGHT-OF-WAY STATUS

STATE PROJECT NO. T201007405

F.A.P. No. N/A for R/W

**BR 1-687, 1-688, 1-693 SOUTH WALNUT STREET,
SOUTH MARKET STREET**

NEW CASTLE COUNTY

Certificate of Right-of-Way Status – 100%

As required by 23CFR Part 635, all necessary right of way has been acquired in accordance with current State/Federal rules and regulations covering the acquisition of real property.

This is to certify that all project rights of way is currently available in accordance with the project right-of-way plans.

It is further certified that there were no individuals or families displaced by this project. Therefore the provisions of 49 CFR Part 24 is not applicable to the project.

There are no improvements to be removed or demolished as part of this project.

REAL ESTATE SECTION

/s/

Carol V. O'Donoghue
Assistant Chief, Real Estate

March 1, 2011



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

CLEON L. CAWLEY, SR.
ACTING SECRETARY

April 19, 2011

ENVIRONMENTAL REQUIREMENTS

for

State Contract No. T201007405
Federal Aid No.: EBHN-2010(29)

Contract Title: BRS 1-687, 1-688, 1-693; South Walnut St., South Market St., and Fourth St.
Over Christina River

In accordance with the procedural provisions for implementing the National Environmental Policy Act of 1969, as amended, the referenced project has been processed through the Department's Environmental Review Procedures and has been classified as a Level D/ Class II Action. As such, a Categorical Exclusion has been prepared to evaluate potential adverse impacts to result from construction of the proposed action (per 23 CFR 771.117 d(3)) and the following special provisions have been developed to mitigate and/or minimize these impacts.

PERMIT REQUIREMENTS:

The construction work that will occur to repair BRS 1-687, 1-688, 1-693; South Walnut St., South Market St., and Fourth St. over Christina River, New Castle County, Delaware requires permit approval from those 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 Corps of Engineers is not required and paperwork for on-site posting should not be anticipated. Copies of the Department of Natural Resources and Environmental Control Authorization must be available on site during all phases of construction activity. Advanced copies of the permits may be obtained from DelDOT Contract Administration, Highway Administration Building, Dover, DE. As such, the construction work that will occur to rehabilitate BRS 1-687, 1-688, 1-693; South Walnut St., South Market St., and Fourth St. over Christina River, New Castle County, Delaware is authorized under the permits/exemptions listed below:



REQUIRED PERMITS AND APPROVAL STATUS:

- Delaware Department of Natural Resources and Environmental Control (DNREC) – Wetlands and Subaqueous Lands - Repair and Replace Authorization - Approved - Letter of Authorization, LA-074/11, dated 04-08-11 (valid until 04-08-12)
- U.S. Coast Guard Coordination for Structural Repairs in Navigable Waters - coordination complete, email dated 3-31-11
- U.S. Coast Guard – 30 day Advance Notification – (coordination to be completed by the contractor, see Miscellaneous Note #6 on Sheet 4 “Project Notes” and Note # 4 on Sheet 58 (BR 1-688 Environmental Compliance Sheet)

SPECIFIC REQUIREMENTS:

Compliance with all requirements of the permits is the responsibility of the contractor. The contractor 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 law if conditions of the permits 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, or on the Environmental Compliance Sheets is also the responsibility of the contractor and is subject to risk of shut down at the contractor's expense.

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.

All construction debris, excavated material, brush, rocks, and refuse incidental to such work shall be placed either on shore above the influence of flood waters or on some suitable disposal site approved by the department.

The disposal of trees, brush, and other debris in any stream corridor, wetland surface water or any drainage ditch is prohibited.

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.

The effort shall be made to keep construction debris 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.

If routine maintenance of worker equipment and heavy machinery is necessary during the construction period, refuse material is prohibited from being disposed or deposited onto or into the ground. All used oils and filters must be recycled or disposed of properly.

Harmful chemical wash water applied to clean equipment or machinery shall be discouraged. If undertaken, the residue water and/or material must be collected or contained such that it will be disposed of properly. By no means, shall it be deposited or disposed of in waterways, streams, wetlands, or drainage areas.

CULTURAL RESOURCE REQUIREMENTS:

The contractor will submit to the District, the location(s) of permanent disposal sites to be used for the disposition of clean wasted materials resulting from the construction contract. The contractor will submit at the Preconstruction meeting, a location map and a plot plan (sketch or diagram) of where on the property clean wasted material is to be placed. The limits of the site(s) will be physically staked or surveyed on the property. The District will submit the contractor's disposal site location(s) to the State Historic Preservation Office (SHPO) for approval.

The SHPO will determine if a cultural resource survey is required before the site can be approved. If additional survey work is required, it will be the contractor's responsibility to hire a qualified professional to assess the site(s) for the presence or absence of cultural resources (i.e. historic or prehistoric archeological sites). The contractor's consultant will be responsible for producing documentation of the survey results for submission to the SHPO.

If the contractor proposes the use of disposal sites outside the State of Delaware, the contractor must provide written approval from the State Historic Preservation Office of each respective state.

A project's disposal operation will not commence until the SHPO has notified the DelDOT District office that the site location(s) is approved for use.

The use of the disposal site will not result in discharge of materials into the U.S. Army Corps of Engineer or DNREC jurisdictional wetlands or waters. It is the responsibility of the contractor to provide any site surveys or wetland delineations needed to preclude wetland encroachment.

The contractor will be responsible for all sediment and erosion control measures and subsequent approvals required for the disposal site(s) operations.

It is the contractor's responsibility to obtain all other appropriate Federal, State, or local approvals required by law for use of the disposal site(s).

DelDOT shall ensure that repairs requiring replacement of historic fabric are done using in-kind materials. Concrete repairs, particularly on visible sections of the bridge wingwalls or rails, should follow DelDOT's 2005 guidance prepared for previous work on Bridge 1-688. This document "Provisions for Compliance with the Secretary of the Interior's Standards for the Treatment of Historic Properties (Rehabilitation)" has been updated to reflect the scope of work in the current project and is attached to this document as Appendix A;

DelDOT shall provide the DE SHPO with a copy of the final, signed project plans, including plan notes or other documents intended to address the DE SHPO's condition #1 stipulated above; and,

Following the Project Plan Note Section 700, Note #9 (Plan Sheet #4) DelDOT shall notify the DE SHPO and other interested parties, including but not limited to the City of Wilmington, if any significant changes into account any comments provided by the DE SHPO and/or interested parties prior to implementing such changes; and,

DelDOT will consult with the DE SHPO concerning any off-site staging or stockpile areas that may be proposed by the contractor and any locations for disposal of project related materials. DelDOT shall ensure that its contractors do not use any such locations if the DE SHPO finds that the activity may affect historic properties

ENVIRONMENTAL COMPLIANCE SHEET:

The contractor shall pay special attention to specific construction requirements as indicated on the Miscellaneous Project Notes (Plan Sheet #4) and the Environmental Compliance Sheet for BR 1-688 (Plan Sheet #58):

For BR's 1-687, 1-688, and 1-693 -Please note the Environmental Requirements as indicated in Note #6 under the Miscellaneous Section of the Project Notes for U.S. Coast Guard 30 day Advance Coordination/Approval.

For BR 1-687 – Please note the Environmental Requirements as indicated in Note #7 under the Miscellaneous Section of the Project Notes for the protection of birds under the Migratory Bird Treaty Act (MBTA). This note states that there is a construction restriction from April 15 to August 1 (inclusive). Either begin construction on the underside of the structure (Spans 1S-4S and 1N-3N) prior to April 15 (to prevent birds from nesting) or wait until after August 1 (after the hatchlings have left) to begin work on the underside. If neither of these options is practicable, then prior to April 14, deterrent netting with 3/4" x 3/4" maximum openings (or similar devise) shall be installed horizontally underneath the structure. The netting should be pulled taut and attached in a way that birds are unable to enter the area between the netting and the structure netting shall be paid for under item 763623- Netting Migratory Bird Exclusion.

For BR 1-688- Please note the environmental requirements as indicted in Note 2B of the Environmental Compliance Sheet (Sheet 58), which states that no in-water (Christina River) work shall occur from March 15 to June 1 (inclusive), any calendar year.

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.

Appendix A

PROVISIONS FOR COMPLIANCE WITH THE SECRETARY OF THE INTERIOR'S STANDARDS FOR THE TREATMENT OF HISTORIC PROPERTIES (REHABILITATION)

**Project: Wilmington Drawbridges 1-687 (South Walnut St.), 1-688 (South Market Street),
and 1-693 (4th Street) over Christina River, Wilmington, New Castle, Co.
State Contract No. T201007405;
Federal Aid No. EBHN-2010(20)**

**Location: South Market Street and South Walnut Street over the Christina River
Wilmington, Delaware**

GENERAL PROVISIONS

The contractor is hereby notified that Bridges 1-687 and 1-688 are considered eligible for the National Register of Historic Places. The National Register recognizes those historic properties with local, State and/or National significance. As such, no additional work or alterations within the design or contract order shall be performed beyond the submitted contract plans, and/or specifications.

If changes outside the project scope that may impact the appearance, structural integrity, function, or operations of the bridge, roadway or waterway system are deemed absolutely necessary, the Delaware Department of Transportation (DelDOT) Environmental Studies Section ((302) 760-2282), attention Jon Schmidt)) shall be contacted prior to implementation. No modifications shall be granted unless they are coordinated and approved by Environmental Studies. Therefore, the contractor or its designated personnel must take every effort (regardless of costs or complexity) to minimize any potential impacts to Bridges 1-687 and 1-688. The contractor will allow DelDOT's Environmental Studies, Bridge Design and any interested parties

time to comment (3 working days following notice) and provide approval prior to implementing such changes.

Moreover, the rehabilitation of Bridges 1-687 and 1-688 are to be carried out in accordance with *the Secretary of the Interior's Standards for Rehabilitation*. As one of four approaches, the *Standards for Rehabilitation* recognizes that although retention and repair of historic materials is the most desirable option, replacement is sometimes necessary for deteriorated elements. For those replaced elements, the new shall be a compatible substitute material, conveying the same form, design, and overall visual appearance as the historic element. Additionally, the *Standards* state that surface cleaning of structures shall be undertaken using the gentlest means possible. Additionally, the *Guidelines for Rehabilitating Historic Buildings* offer further guidance. The following specific provisions provide instructions for this project. For more information on the *Secretary's Standards and Guidelines*, go to www2.cr.nps.gov/tps/standguide/index.htm.

SPECIAL PROVISIONS

Concrete Cleaning

Specific instructions have been established to ensure that the work is in compliance with the *Secretary's Standards*. Recommended treatments for cleaning concrete include:

Carrying out surface cleaning tests after it has been determined that such cleaning is necessary. Tests should be observed over a sufficient period of time so that both the immediate effects and long range effects are known to enable selection of the gentlest means possible.

Cleaning masonry surfaces with the gentlest method possible, such as low- pressure water and detergents, using natural bristle brushes.

Treatments that should be avoided include, but are not limited to:

Cleaning masonry surfaces without testing or without sufficient time for the testing results to be of value.

Sandblasting using wet or dry grit or other abrasives. These methods of cleaning permanently erode the surface of the material and accelerate deterioration.

Using a cleaning method that involves water or liquid chemical solutions when there is any possibility of freezing temperatures.

Cleaning with chemical products that will damage masonry, such as using acid on limestone or marble, or leaving chemicals on masonry surfaces.

Applying high pressure water cleaning methods that will damage historic masonry and the mortar joints.

The concrete cleaning will be under a review and approval process (See below).

Concrete Patching

While undertaking the proposed patching of the concrete parapet, the contractor must make every effort to closely match the strength, color, texture, and granular appearance of the existing concrete. Recommended treatments include:

Repairing masonry features by patching, piecing-in, or consolidating the masonry using recognized preservation methods.

Treatments that should be avoided, but are not limited to:

Using a substitute material for the replacement part that does not convey the visual appearance of the surviving parts of the masonry feature or that is physically or chemically incompatible.

Removing a masonry feature that is unreparable and not replacing it; or replacing it with a new feature that does not convey the same visual appearance.

The concrete patching along with the cleaning will be under the review and approval process. Preservation Brief #15, Preservation of Historic Concrete: Problems and General Approaches (published by National Park Service) offers these further instructions for the patching of concrete:

Repair of spalling entails removing the loose, deteriorated concrete and installing a compatible patch that dovetails into the existing sound concrete. In order to prevent future crack development after the spall has been patched and to ensure that the patch matches the historic concrete, great attention must be paid to the treatment of rebars, the preparation of the existing concrete substrate, the selection of compatible patch material, the development of good contact between patch and substrate, and the curing of the patch.

Once the deteriorated concrete in a spalled area has been removed, rust on the exposed rebars must be removed by wire brush or sandblasting. An epoxy coating applied immediately over the cleaned rebars will diminish the possibility of further corrosion. As a general rule, if the rebars are so corroded that a structural engineer determines that should be replaced, new supplemental reinforcing bars will normally be required, assuming that the rebar is important to the strength of the concrete. If not, it is possible to cut away the rebar.

Proper preparation of the substrate will ensure a good bond between the patch and the existing concrete. If a large, clean break or other smooth surface is to be patched, the contact area should be roughened with a hammer and chisel. In all cases, the substrate should be kept moist with wet rags, sponges, or running water for at least an hour before placement of the patch. Bonding between the patch and substrate can be encouraged by scrubbing the substrate with cement paste, or by applying a liquid bonding agent to the surface of the substrate. Admixtures such as epoxy resins, latexes, and acrylics in the patch may also be used to increase bonding, but this may cause problems with color matching if the surfaces are to be left unpainted.

Compatible matching of patch material to the existing concrete is critical for both appearance and durability. In general, repair material should match the composition of the original material (as revealed by laboratory analysis) as closely as possible so that the properties of the two materials, such as coefficient of thermal expansion and strength are compatible. Matching the color and texture of the existing concrete requires special care. Several test batches of patching material should be mixed by adding carefully selected mineral pigments that vary slightly in color. After the samples have cured, they can be compared to the historic concrete and the closest match selected.

BID PROPOSAL FORMS

CONTRACT T201007405.01

FEDERAL AID PROJECT EBHN-2010(29)

CONTRACT ID: T201007405.01 PROJECT(S): EBHN-2010(29)

All figures must be typewritten.

CONTRACTOR : _____

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

SECTION 0001 BRS 1-687, 1-688, 1-693; SOUTH WALNUT ST., SOUTH MARKET ST. AND FOURTH ST. OVER CHRISTINA RIVER

0010	201000 CLEARING AND GRUBBING	LUMP		LUMP		
0020	202000 EXCAVATION AND EMBANKMENT	CY	36.000			
0030	211000 REMOVAL OF STRUCTURES AND OBSTRUCTIONS	LUMP		LUMP		
0040	251000 SILT FENCE	LF	150.000			
0050	302007 GRADED AGGREGATE BASE COURSE, TYPE B	CY	46.000			
0060	601535 TIMBER SIDEWALK	SF	2985.000			
0070	602013 PORTLAND CEMENT CONCRETE MASONRY, SUPERSTRUCTURE, CLASS D	CY	43.000			
0080	602017 PORTLAND CEMENT CONCRETE MASONRY, PARAPET, CLASS A	CY	14.000			
0090	602518 WATER BASED ACRYLIC CONCRETE SEALER	SF	9906.000			

CANNOT BE USED FOR BIDDING

CONTRACT ID: T201007405.01 PROJECT(S): EBHN-2010(29)

All figures must be typewritten.

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0100	602546 WATERPROOFING P.C. C. MASONRY	40905.000 SF				
0110	602572 REPAIRING EXISTING P.C.C. STRUCTURES	8425.000 LB				
0120	602575 DECK REPAIR, 1" TO 3" DEPTH	537.000 SF				
0130	602576 DECK REPAIR, 3" TO < FULL DEPTH	132.000 SF				
0140	602577 DECK REPAIR, FULL DEPTH	20.000 SF				
0150	602579 DRILLING HOLES AND INSTALLING DOWELS	822.000 EACH				
0160	602580 PARTIAL REMOVAL OF P.C.C. MASONRY	57.000 CY				
0170	602586 REHABILITATION OF CONCRETE STRUCTURE	97.000 CF				
0180	602611 REPAIR OF CONCRETE STRUCTURES BY EPOXY INJECTION	415.000 LF				
0190	602612 ACCESS AND CONTAINMENT FOR BRIDGE REPAIRS	LUMP		LUMP		

CANNOT BE USED FOR BIDDING

CONTRACT ID: T201007405.01 PROJECT(S): EBHN-2010(29)

All figures must be typewritten.

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0200	602626 ROUT AND SEAL CRACKS	415.000 LF				
0210	602629 CRACK SEALING BRIDGE DECKS, APPROACH SLABS, SIDEWALK, ETC.	2736.000 LF				
0220	602646 SILICONE ACRYLIC CONCRETE SEALER	47629.000 SF				
0230	603000 BAR REINFORCEMENT	70.000 LB				
0240	604000 BAR REINFORCEMENT, EPOXY COATED	9781.000 LB				
0250	605533 CLEANING EXISTING STEEL STRUCTURES, HAZARDOUS BASE, (L.S.)	LUMP		LUMP		
0260	605582 CLEANING BRIDGE SCUPPER	6.000 EACH				
0270	605585 STEEL STRUCTURE REPAIR	LUMP		LUMP		
0280	605591 STEEL OPEN GRID BRIDGE DECK	177.000 SF				
0290	605592 WELDING REPAIR	100.000 LF				

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All figures must be typewritten.

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0300	605619 MOISTURE CURED URETHANE PAINT SYSTEM (OVERCOATING), L.S.	LUMP	LUMP			
0310	605636 CLEAN AND LUBRICATE BRIDGE BEARINGS	EACH	126.000			
0320	605641 JOINT REPAIR (COMPRESSION SEAL), 1"	LF	142.000			
0330	605658 STRIP SEAL EXPANSION JOINT, 2"	LF	264.000			
0340	605676 INFLATABLE EXPANSION JOINT SEAL, 3"	LF	143.000			
0350	605692 SILICONE JOINT SEAL	LF	527.000			
0360	605730 PREFABRICATED EXPANSION JOINT SYSTEM, 1"	LF	200.000			
0370	606501 HAND RAIL, TYPE I	LF	22.000			
0380	606509 REPAIRING METAL BRIDGE RAILING, ALUMINUM	LF	2058.000			
0390	701010 PORTLAND CEMENT CONCRETE CURB, TYPE 1	LF	40.000			

CANNOT BE USED FOR BIDDING

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All figures must be typewritten.

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0400	701501 RESET EXISTING STONE CURB	20.000 LF				
0410	701508 PORTLAND CEMENT CONCRETE MONOLITHIC MEDIAN CURB	51.000 LF				
0420	705001 P.C.C. SIDEWALK, 4"	532.000 SF				
0430	705505 RESET STONE/BRICK SIDEWALK AND/OR STONE/BRICK ROADWAY	160.000 SF				
0440	712005 RIPRAP, R-4	4.000 SY				
0450	713002 GEOTEXTILES, SEPARATION	87.000 SY				
0460	715001 PERFORATED PIPE UNDERDRAINS, 6"	31.000 LF				
0470	720526 PORTABLE P.C.C. STRUCTURE-MOUNTED SAFETY BARRIER	200.000 LF				
0480	720532 INSTALL PORTABLE IMPACT ATTENUATOR	2.000 EACH				
0490	720534 FURNISH PORTABLE IMPACT ATTENUATOR	3.000 EACH				

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All figures must be typewritten.

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0500	720539 RELOCATE PORTABLE IMPACT ATTENUATOR	2.000 EACH				
0510	720551 RELOCATING PORTABLE P.C.C. STRUCTURE MOUNTED SAFETY BARRIER	200.000 LF				
0520	732002 TOPSOIL, 6" DEPTH	271.000 SY				
0530	734013 PERMANENT GRASS SEEDING, DRY GROUND	271.000 SY				
0540	743003 ARROWPANELS, TYPE C	1100.000 EADY				
0550	743006 PLASTIC DRUMS	34790.000 EADY				
0560	743007 TRAFFIC OFFICERS	700.000 HOUR		75.00000		52500.00
0570	743009 FURNISH AND MAINTAIN TRUCK MOUNTED ATTENUATOR, TYPE I	235.000 EADY				
0580	743050 FLAGGER, NEW CASTLE COUNTY, STATE	6100.000 HOUR		44.52000		271572.00
0590	743062 FLAGGER, NEW CASTLE COUNTY, STATE, OVERTIME	915.000 HOUR		64.55000		59063.25

CANNOT BE USED FOR BIDDING

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All figures must be typewritten.

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0600	743504 WARNING SIGNS	92.000 EACH				
0610	743507 TEMPORARY BARRICADE, TYPE III	20100.000 LFDY				
0620	743525 TEMPORARY WARNING SIGNS	1645.000 EADY				
0630	748015 PERMANENT PAVEMENT STRIPING, SYMBOL/LEGEND ALKYD-THERMOPLAST IC	235.000 SF				
0640	748019 TEMPORARY MARKINGS, PAINT, 4"	260.000 LF				
0650	748517 BLACKOUT TAPE, 4"	415.000 LF				
0660	748525 TEMPORARY MARKINGS, TAPE, 4"	9980.000 LF				
0670	748527 TEMPORARY MARKINGS, TAPE, WORDS/SYMBOLS	1110.000 SF				
0680	748530 REMOVAL OF PAVEMENT STRIPING	75.000 SF				
0690	749687 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON SINGLE SIGN POST	16.000 EACH				

CANNOT BE USED FOR BIDDING

CONTRACT ID: T201007405.01 PROJECT(S): EBHN-2010(29)

All figures must be typewritten.

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0700	758000 REMOVAL OF EXISTING PORTLAND CEMENT CONCRETE PAVEMENT, CURB, SIDEWALK, ETC.	87.000 SY				
0710	762003 SAW CUTTING, CONCRETE, VARIABLE DEPTH	430.000 LF				
0720	763000 INITIAL EXPENSE	LUMP	LUMP			
0730	763500 MAINTENANCE OF TRAFFIC	LUMP	LUMP			
0740	763501 CONSTRUCTION ENGINEERING	LUMP	LUMP			
0745	763503 TRAINEE	1040.000 HOUR		0.80000		832.00
0750	763508 PROJECT CONTROL SYSTEM DEVELOPMENT PLAN	LUMP	LUMP			
0760	763509 CPM SCHEDULE UPDATES AND/OR REVISED UPDATES	25.000 EAMO				
0770	763522 COAST GUARD SPECIFIC CONDITIONS	LUMP	LUMP			
0780	763593 MODIFICATIONS TO TRAFFIC BARRIER GATE	LUMP	LUMP			

CANNOT BE USED FOR BIDDING

CONTRACT ID: T201007405.01 PROJECT(S): EBHN-2010(29)

All figures must be typewritten.

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0790	763602 BIRD CONTROL	LUMP	LUMP			
0800	763623 NETTING MIGRATORY BIRD EXCLUSION	LUMP	LUMP			
	SECTION 0001 TOTAL					
	SECTION 0002 SPECIALTY ITEMS					
0810	605590 BASCULE MACHINERY REPLACEMENT	LUMP	LUMP			
0820	746662 REPAIR BRIDGE ELECTRICAL SYSTEM	LUMP	LUMP			
	SECTION 0002 TOTAL					
	TOTAL BID					

CANNOT BE USED FOR BIDDING

CANNOT BE

BREAKOUT SHEETS

THE FOLLOWING SHEETS MUST BE COMPLETED AND RETURNED WITH THE PROPOSAL AT THE TIME OF BID. FAILURE TO COMPLETE THE BREAKOUT SHEETS AS REQUIRED WILL RESULT IN THE BID BEING DECLARED NON-RESPONSIVE AND WILL NOT BE CONSIDERED. BREAKOUT SHEETS MUST BE COMPLETED REGARDLESS OF WHETHER BIDDING BY ELECTRONIC MEANS OR TYPEWRITTEN HARD COPY.

BIDDING

SECTION 1		BREAKOUT SHEET - 1		CONTRACT NO. T201007405	
ITEM 605533 - CLEANING EXISTING STEEL STRUCTURES, HAZARDOUS BASE (L.S)					
ITEM NO.	APPROX. QTY.	UOM	DESCRIPTION	UNIT PRICE	AMOUNT
Bridge 687 - Walnut Street					
1	17,000	SF	Bridge Main and Approach Span Painting, Including Live Load Hold Downs	\$	\$
2	3,000	SF	Bridge Main and Approach Span Spot Painting	\$	\$
Bridge 693 - Fourth Street					
1	2,200	SF	Bridge Main and Approach Span Painting, Including Live Load Hold Downs	\$	\$
2	2,600	SF	Bridge Main and Approach Span Spot Painting	\$	\$
TOTAL ITEM 605533 - CLEANING EXISTING STEEL STRUCTURES, HAZARDOUS BASE (L.S.) \$ _____ (LUMP SUM BID PRICE FOR ITEM 605533)					

SECTION 1		BREAKOUT SHEET - 2		CONTRACT NO. T201007405	
ITEM 605619 - MOISTURE CURED URETHANE PAINT SYSTEM (OVERCOATING)					
ITEM NO.	APPROX. QTY.	UOM	DESCRIPTION	UNIT PRICE	AMOUNT
Bridge 687 - Walnut Street					
1	17,000	SF	Bridge Main and Approach Span Painting, Including Live Load Hold Downs	\$	\$
2	3,000	SF	Bridge Main and Approach Span Spot Painting	\$	\$
Bridge 693 - Fourth Street					
1	2,200	SF	Bridge Main and Approach Span Painting, Including Live Load Hold Downs	\$	\$
2	2,600	SF	Bridge Main and Approach Span Spot Painting	\$	\$
TOTAL ITEM 605619 - MOISTURE CURED URETHANE PAINT SYSTEM (OVERCOATING) \$ _____ (LUMP SUM BID PRICE FOR ITEM 605619)					

SECTION 1

BREAKOUT SHEET - 3

CONTRACT NO. T201007405

ITEM 605585 -STEEL STRUCTURE REPAIR

ITEM NO.	APPROX. QTY.	UOM	DESCRIPTION	UNIT PRICE	AMOUNT
Bridge 687 - Walnut Street					
1	4	LS	Live Load Anchorage Repair	\$	\$
2	3	LS	Sidewalk Stringer Repair	\$	\$
3	1	LS	Traffic Barrier Rail	\$	\$
Bridge 688 - South Market Street					
1	4	LS	Modification of Trunnion Column Brace Connection to Pier Wall	\$	\$
Bridge 693 - Fourth Street					
1	4	LS	Live Load Anchorage Repair	\$	\$
2	1	LS	Expansion Joint Armor at North Abutment	\$	\$
TOTAL ITEM 605585 - Steel Structure Repair \$ _____ (LUMP SUM BID PRICE FOR ITEM 605585)					

SECTION 1

**BREAKOUT SHEET - 4
ITEM 605590 - Bascule Machinery Repair**

CONTRACT NO. T201007405

ITEM NO.	UOM	DESCRIPTION	UNIT PRICE	AMOUNT
Bridge 687 - Walnut Street				
1	LS	Work Item M1	\$	\$
2	LS	Work Item M2	\$	\$
3	LS	Work Item M3	\$	\$
4	LS	Work Item M4	\$	\$
5	LS	Work Item M5	\$	\$
6	LS	Work Item M6	\$	\$
7	LS	Strain Gage Balancing	\$	\$
8	LS	Maintaining Span Balance	\$	\$
Bridge 693 - Fourth Street				
1	LS	Work Item M7	\$	\$
2	LS	Work Item M8	\$	\$
3	LS	Work Item M9		
4	LS	Work Item M10		
5	LS	Work Item M11		
6	LS	Strain Gage Balancing		
7	LS	Maintaining Span Balance		
<p style="text-align: right;">TOTAL ITEM 605590 - Bascule Machinery Repair \$ _____ (LUMP SUM BID PRICE FOR ITEM 605590)</p>				

SECTION 1		BREAKOUT SHEET - 5		CONTRACT NO. T201007405	
ITEM 746662 - Repair Bridge Electrical System					
ITEM NO.	UOM	DESCRIPTION	UNIT PRICE	AMOUNT	
Bridge 687 - Walnut Street					
1	LS	Work Item E1	\$	\$	
2	LS	Work Item E2	\$	\$	
3	LS	Work Item E3	\$	\$	
Bridge 693 - Fourth Street					
1	LS	Work Item E4	\$	\$	
2	LS	Work Item E5	\$	\$	
			TOTAL ITEM 746662 - Repair Bridge Electrical System \$		
			(LUMP SUM BID PRICE FOR ITEM 746662)		

"ATTENTION"

TO BIDDERS

This Bid Proposal includes breakout sheets. The breakout sheets **MUST ACCOMPANY** the bid proposal at the time of bid. Failure to return completed breakout sheets **WILL RESULT** in the bid proposal being declared non-responsive and **REJECTED** as irregular.

SUBMISSIONS REQUIRED AT THE TIME OF BID

1. Copy(ies) of the American Traffic Safety Services Association (ATSSA) Certification(s) when listed in the applicable plan notes
2. Standard Specification Section 110.08 Site Reviewer requires that the name and DNREC certification number of each Site Reviewer if required shall be submitted to the Department at the time of bid. The level of certification and number required are listed in the applicable plan notes.
3. Proposed Trainee Plans as required. Number of required programs is listed in the Training Special Provisions within Contract General Notices. The program(s) must be submitted with 10 Calendar Days of notification of apparent low bidder status. Contract Award will not take place until acceptable On-the-Job (OJT) program plans are received by the Civil Rights Group of the Department.

Note: Items 1. and 2. above require copies of the current certifications for those individuals proposed for use on this Contract

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

CANNOT BE
USED FOR
BIDDING

CERTIFICATION

Contract No. T201007405.01
Federal Aid Project No. EBHN-2010(29)

The undersigned bidder, _____ whose address is _____
_____ and telephone number is _____
_____ hereby certifies the following:

I/We have carefully examined the location of the proposed work, the proposed plans and specifications, and will be bound, upon award of this contract by the Department of Transportation, to execute in accordance with such award, a contract with necessary surety bond, of which contract this proposal and said plans and specifications shall be a part, to provide all necessary machinery, tools, labor and other means of construction, and to do all the work and to furnish all the materials necessary to perform and complete the said contract within the time and as required in accordance with the requirements of the Department of Transportation, and at the unit prices for the various items as listed on the preceding pages.

Bidder's Certification Statement [US DOT Suspension and Debarment Regulation (49 CFR 29)]:

NOTICE: All contractors who hold prime contracts (Federal Aid) with DelDOT are advised that the prime contractor and subcontractors are required to submit to DelDOT a signed and notary attested copy of the Bidder Certification Statement for each and every subcontract that will be utilized by the prime contractor. This Certification **must** be filed with DelDOT prior to written approval being granted for each and every subcontractor. Copies of the Certification Form are available from the appropriate District Construction Office.

Under penalty of perjury under the laws of the United States, that I/We, or any person associated therewith in the capacity of (owner, partner, director, officer, principal, investigator, project director, manager, auditor, or any position involving the administration federal funds):

- a. am/are not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any federal agency;
- b. have not been suspended, debarred, voluntarily excluded or determined ineligible by any federal agency within the past 3 years;
- c. do not have a proposed debarment pending; and,
- d. have not been indicted, convicted, or had a civil judgement rendered against (it) by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

Exceptions will not necessarily result in denial of award, but will be considered in determining bidder responsibility. For any exception noted, indicate below to whom it applies, initiating agency, and dates of action. Providing false information may result in criminal prosecution or administrative sanctions.

(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								
-----	------	-----	------	-----	------	-----	------	-----	------

(FAILURE TO ACKNOWLEDGE RECEIPT OF ALL ADDENDA WILL RESULT IN THE BID BEING DECLARED NON-RESPONSIVE.)

Sealed and dated this _____ day of _____ in the year of our Lord two thousand and _____ (20__).

Name of Bidder (Organization)

Corporate
Seal

By: _____
Authorized Signature

Attest _____

Title

SWORN TO AND SUBSCRIBED BEFORE ME this ____ day of _____, 20__.

Notary
Seal

Notary

BID BOND

TO ACCOMPANY PROPOSAL
(Not necessary if security is used)

KNOW ALL MEN BY THESE PRESENTS That: _____
of _____ in the County of _____ and State of _____
as **Principal**, and _____ of _____ in the County
of _____ and State of _____ as **Surety**, legally authorized to do business in the State of Delaware
("State"), are held and firmly unto the **State** in the sum of _____
Dollars (\$ _____), or _____ percent not to exceed _____
Dollars (\$ _____) of amount of bid on Contract No.
T201007405.01, 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

Witness: _____

Name of Surety

By: _____

Title

