

INFORMATIONAL PROPOSAL

(For information only, not to be used for bidding)

NEBRASKA DEPARTMENT OF ROADS
LETTING DATE: September 01, 2016

CALL ORDER: 200
CONTROL NO. SEQ. NO.: 22631 000
TENTATIVE START DATE: 04/03/2017
LOCATION: US-275, SOUTH OMAHA VETERANS BRIDGE
IN COUNTIES: DOUGLAS, POTTAWATTAMIE IA

CONTRACT ID: 2631X
PROJECT NO.: STR-275-7(1045)
CONTRACT TIME: 210 Calendar Days

BIDDER

GROUP 6 BRIDGE AT STATION 140+75.77

NOTES

THE TOTAL AMOUNT OR WORK WHICH WILL BE ACCEPTED IN
THIS LETTING IS LIMITED TO \$ _____

THE NUMBER OF GROUP _____ CONTRACTS WHICH WILL BE
ACCEPTED IN THIS LETTING IS LIMITED TO _____.

NOTICE TO ALL BIDDERS

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.

LETTING QUESTIONS

Prior to the letting, any questions pertaining to the Special Provisions or the Plans for this project should be submitted to NDOR in a written format through the Bid Express (BidX) website at <https://www.bidx.com/ne/lettings>. Likewise, NDOR will post answers exclusively to the BidX website. All official answers will be identified as “Authorized by NDOR.” **Questions will not be answered verbally.**

STATE OF NEBRASKA
DEPARTMENT OF ROADS

Required Provisions Supplemental to the

Standard Specifications for Highway Construction

I. Application

These contract provisions shall apply to all work performed on the contract by the contractor with his own organization and with the assistance of workmen under his immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

The contractor shall insert in each of his subcontracts all of the stipulations contained in the Special Provisions and these Required Provisions.

A breach of any of the stipulations contained in these Required Provisions may be grounds for termination of the contract.

II. Equal Opportunity

1. **Selection of Labor**

During the performance of this contract, the contractor shall not discriminate against labor from any other state.

2. **Nebraska Fair Employment Practices Act**

The contractor shall not discriminate against any employee or applicant for employment, to be employed in the performance of this contract with respect to his hire, tenure, terms, conditions, or privileges of employment, because of his race, color, religion, sex or national origin. The contractor agrees to post in a conspicuous place or places a notice to be provided by the State Highway Department which sets forth excerpts of the Act.

3. **Nebraska Equal Pay Act**

The contractor shall not discriminate on the basis of sex by paying wages to employees of one sex at a lesser rate than the rate paid to employees of the opposite sex for comparable work on jobs which have comparable requirements. An abstract of the Act is included on the notice which is provided by the State Highway Department.

April 4, 1995

III. Employment of Labor

1. General

No person under the age of sixteen (16) years, and no one whose age or physical condition is such as to make his employment dangerous to his health or safety, or to the health and safety of others shall be employed on any project. This paragraph shall not be construed to deny the employment of older people or physically handicapped persons, otherwise employable, where such persons may be safely assigned to work which they can ably perform.

No person currently serving sentence to a penal or correction institution shall be employed on any project.

Except as specifically provided under this section, workers who are qualified by training or experience to be assigned to projects of this character shall not be discriminated against on any grounds whatsoever.

2. Payrolls

Payrolls and basic records relating thereto will be maintained during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working on the site of the work.

The contractor's and subcontractor's payroll records shall be available for inspection by authorized representatives of the State Highway Department and authorized representatives of Federal Agencies.

The wages of labor shall be paid in legal tender of the United States, except that this condition will be considered satisfied if payment is made by a negotiable check, on a solvent bank, which may be cashed readily by the employee in the local community for the full amount, without discount or collection charges of any kind. Where checks are used for payment the contractor shall make all necessary arrangements for them to be cashed and shall give information regarding such arrangements.

No fee of any kind shall be asked or accepted by the contractor or any of his agents from any person as a condition of employment on the project.

No laborers shall be charged for any tools used in performing their respective duties except for reasonably avoidable loss or damage thereto.

Every employee on the work covered by this contract shall be permitted to lodge, board and trade where and with whom he elects and neither the contractor nor his agents, nor his employees shall directly or indirectly require as a condition of employment that an employee shall lodge, board or trade at a particular place or with a particular person.

No charge shall be made for any transportation furnished by the contractor or his agents to any person employed on the work.

April 4, 1995

No individual shall be employed as a laborer on this contract except on a wage basis, but this shall not be construed to prohibit the rental of teams, trucks or other equipment from individuals. No such rental agreement, or any charges for feed, gasoline, supplies, or repairs on account of such agreement, shall cause any deduction from the wages accruing to any employee except as authorized by the regulations hereinbefore cited.

IV. Safety and Accident Prevention

In the performance of this contract, the contractor shall comply with all applicable Federal, State and local laws governing safety, health and sanitation. The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions, on his own responsibility or as the contracting officer may determine, 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.

V. Subletting or Assigning the Contract

The contractor shall perform with his own organization contract work amounting to not less than 30 percent of the total contract amount except that any items designated in the contract as "Specialty Items" may be performed by subcontract and the amount of any such "Specialty Items" so performed may be deducted from the total contract amount before computing the amount of work required to be performed by the contractor with his own organization.

Any items that have been selected as "Specialty Items" for the contract are listed as such in the Special Provisions found elsewhere in the contract.

No portion of the contract shall be sublet, assigned, or otherwise disposed of except with the written consent of the contracting officer or his authorized representative. Requests for permission to sublet assign or otherwise dispose of any portion of the contract shall be in writing and accompanied by a showing that the organization which will perform the work is particularly experienced and equipped for such work. The contractor shall give assurance that the minimum wage for labor as stated in his proposal shall apply to labor performed on all work sublet, assigned or otherwise disposed of in any way. Consent to sublet, assign or otherwise dispose of any portion of the contract shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract.

April 4, 1995

**SPECIAL PROVISIONS
FOR
STATE
PROJECT NO. STR-275-7(1045)**

GENERAL CONDITIONS

Bids for the work contemplated in this proposal form will be received at the office of the Nebraska Department of Roads in Room 104 of the Central Office Building at 1500 Highway 2 at Lincoln, Nebraska, on September 1, 2016, until 1:30 P.M.

- a. Bids submitted by mail should be addressed to the Nebraska Department of Roads, c/o Contract Lettings Section, P.O. Box 94759, Lincoln, NE 68509-4759.
- b. Bids submitted electronically over the internet, shall be submitted using www.bidx.com.

The 2007 Edition of the Standard Specifications for Highway Construction, including all amendments and additions thereto effective at the date of the contract, are made a part of these Special Provisions, through reference.

The Required Provisions dated April 4, 1995, are attached to and are a part of this proposal form.

The attention of bidders is directed to the Required Provisions covering subletting or assigning the contract.

The proposal contains a statement that the contractor is complying with, and will continue to comply with, fair labor standards in the pursuit of his business and in the execution of the work contemplated in this proposal.

Fair labor standards shall be construed to mean such a scale of wages and conditions of employment as are paid and maintained by at least fifty per cent of the contractors in the same business or field of endeavor as the contractor filing this proposal.

STATUS OF UTILITIES

The following information is current as of August 1, 2016.

At this time, no utilities have been required to relocate their facilities.

Aerial and/or underground utilities may exist within the limits of this project. The Contractor shall determine to his satisfaction the extent of occupancy of any underground utilities located within the respective construction areas and the extent of conflict with the proposed work under this contract.

Any utility adjustments or interruption of service for the convenience of the Contractor shall be the sole responsibility of the Contractor.

To arrange for utilities to locate and flag their underground facilities, contact Diggers Hotline of Nebraska at 1-800-331-5666 or dial 811.

Any work necessary will be concurrent with construction.

STATUS OF RIGHT OF WAY

The right of way for this project has been acquired and physical possession is held by the State of Nebraska and ready for the Contractor's use, except tracts listed below:

Unacquired Right-of-Way Tracts as follows:

Tract Number	Status of Tract	Hearing Date
None	None	None

Right-of-Way Tracts with Pay Items:

Tract Number	Pay Items
None	None

- No encroachments on the old right of way.
- Acquisition of right of way is not required for this project.

ENVIRONMENTAL COMMITMENT

Control No.: 22631 **Project No.:** STR-275-7(1045)
Project Name: South Omaha Veterans Memorial Bridge

Below are the Conservation Conditions that will be required for this project. All conditions and regulations of any permit obtained for this project will be followed by the contractor.

(Responsible Party for the measure is found in parentheses)

Conservation Measure for Environmentally Sensitive Areas

All wetlands within the project area will be marked on the project plans for the Contractor as avoidance areas. (NDOR Design, NDOR Environmental)

The Contractor shall not stage, store, waste or stockpile materials and equipment in undisturbed locations, or in known/potential wetlands and/or known/potential streams that exhibit a clear "bed and Bank" channel. Potential wetland areas consist of any area that is known to pond water, swampy areas or areas supporting known wetland vegetation or areas where there is a distinct difference in vegetation (at lower elevations) from the surrounding upland areas. (Contractor, NDOR District)

- Regulated Wetlands and/or Water Resources for this project have been identified and delineated in the field by NDOR. The above condition pertains to the areas within delineated wetland boundaries (Wetlands – Do Not Disturb) and/or environmentally sensitive areas (Area of Environmental Concern – Do Not Disturb) as shown in the 2-W aerial plan sheets and/or the erosion control plan sheets included in the plan set. If access to any of these areas is required to complete the project construction, the NDOR

construction project manager shall coordinate with the Environmental Permits Unit to determine need for field verification and/or permitting requirements prior to disturbance of the area. (Contractor, District Construction)

Contact Person: Mary Schroer, Highway Environmental Biologist, (402) 479-3969

General Conservation Conditions

Changes in Project Scope. If there is a change in the project scope, the project limits, or environmental commitments, the NDOR Environmental Section must be contacted to evaluate potential impacts prior to implementation. Environmental commitments are not subject to change without prior written approval from the NDOR Environmental Section. (District Construction, Contractor)

Threatened and Endangered Species. The Contractor shall reference the the Nebraska Game and Parks Commission website for a reference of federal and state listed species that may occur in the project vicinity prior to starting project construction. These guidance document can be found at:

- <http://outdoornebraska.gov/atriskspecies/>

If federal or state listed species are observed during construction, stop work and contact the NDOR Environmental Section to determine action required prior to resuming work (NDOR Environmental, District Construction, Contractor)

Refueling. Refueling will be conducted within the confines of the paved roadway surface or within the boundaries of an approved stockpile/staging site (Contractor)

Restricted Activities. The following project activities shall, to the extent possible, be restricted to between the beginning and ending points of the project, within the right-of-way designated on the project plans.

- Borrow sites
- Construction debris waste disposal areas
- Asphalt plants
- Haul roads
- Stockpiling areas
- Staging areas
- Material storage sites

Any project related activities that occur outside of the project limits (includes the paved surface and within 12 inches of the paved surface) must be environmentally cleared/permitted with the Nebraska Game and Parks Commission as well as any other appropriate agencies by the contractor and those clearances/permits shall be submitted to the District Construction Project Manager prior to the start of the above listed project activities. The contractor shall submit a NDOR Plant Site/Stockpile Site Request Identification and Evaluation Form (DR Form 56) and/or a Borrow Site/Waste Site Request Identification and Evaluation Form (DR Form 119) as appropriate, and include information such as an aerial photo showing the proposed activity site, a plan-sheet or drawing showing the location and dimensions of the activity site, ground photos showing the existing conditions at the proposed activity site, etc. The contractor must receive

notice of acceptance from NDOR, prior to starting the above listed project activities. These project activities cannot adversely affect state and/or federally listed species or designated critical habitat. Fill cannot be placed in Wetland, Stream or other Waters of the U.S without authorization. (NDOR Environmental, District Construction, Contractor)

Waste/Debris. Construction waste/debris will be disposed of in areas or a manner which will not adversely affect state and/or federally listed species and/or designated critical habitat. (Contractor)

Contact Person: Melissa Marinovich, Highway Environmental Biologist, (402) 479-3546

Encountering Unexpected Waste

If contaminated soils and/or water or hazardous materials are encountered, then all work within the immediate area of the discovered hazardous material shall stop until NDOR/FHWA is notified and a plan to dispose of the Hazardous Materials has been developed. Then NDEQ shall be consulted and a remediation plan shall be developed for this project. The potential exists to have contaminants present resulting from minor spillage during fueling and service associated with construction equipment. Should contamination be found on the project during construction, the NDEQ shall be contacted for consultation and appropriate actions to be taken. The Contractor is required by NDOR's Standard Specification section 107 (legal relations and responsibilities to the public) to handle and dispose of contaminated material in accordance with applicable laws. (NDOR District, Contractor)

Contact Person: Carrie Wencel, Highway Environmental Biologist, (402) 479-4836

FLOODPLAIN PERMIT

Nebraska Department of Roads Floodplain/Floodway Development Permit/Application

RECEIVED
MAR 31 2016
ENVIRONMENTAL SECTION

Permit Application No. FLD-16-00850
Date: 3/20/16

This form is used for any man-made change to improved or unimproved transportation facility, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation, drilling operations, or storage of equipment or materials.

Nebraska Department of Roads will obtain all other necessary federal, state, or local permits (e.g., Corps of Engineers 404 Permit, Local Levee District, etc.)

1.	Name of Applicant:	Nebraska Department of Roads PO Box 94759 Lincoln NE 68509-4759
2.	Type and Use of Development:	Bridge Rehabilitation
3.	Specific Location of Development:	Section 2/3 T 14 N R 13 E

The following section is provided by NDOR for the community official's monitoring/tracking purposes:


4.	Is the Development Substantial Improvement? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Complete this section if the proposed development involves the improvement of a structure (i.e., walled and roofed building). Pre-improvement Value of Structure: \$ Cost of Improvement: \$
5.	Is the development in an identified floodplain? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Please see attached documentation. If Yes, complete the following: a. Elevation of the Base (100-Year) Flood <u>980.0</u> Ft. MSL/NGVD 29 or NAVD 88 Or Worst case impact rise in the Base (100-year) Flood * If project includes multiple floodplain crossings, this information is summarized in attached documentation. b. Elevation/Floodproofing Requirement (if applicable) <u>N/A</u> FL MSL/NGVD 29 or NAVD 88 c. Is the development in a designated Floodway? <input checked="" type="checkbox"/> Yes New structures for human habitation are prohibited. For any other Floodway development, the NDOR must provide certification by a registered professional engineer that the development would result in no increase along the floodway water surface profile. <input type="checkbox"/> No If a floodway has not been designated, the NDOR may be required to submit hydraulic data demonstrating that the proposed development will not increase flood heights more than one foot at any location.

If the development is in a floodplain, the following shall apply:

If work includes a new or substantially improved nonresidential building, NDOR will provide certification by a Registered Engineer, Architect, or Land Surveyor that the building is elevated or flood proofed at least one foot above the base flood elevation.

By signing below, the local authorizing official acknowledges the above and any floodplain information submitted with this permit application.

All provisions of the Omaha Floodplain Management Resolution/Ordinance (Number 3994) shall be complied with.
(County or City)


Local Authorizing Official (Name & Title)

3/31/2016
Date


NDOR Environmental Permits Manager

3-20-2016
Date

for Tony Ringenberg

Project Name: South Omaha Veterans Memorial Bridge	
Project No.: 275-7(1045)	
Control No.: 22631	Structure No.: S275 19041

**SPECIAL PROSECUTION AND PROGRESS
(Migratory Birds)
(A-42-1112)**

The Department of Roads will, to the extent practicable, schedule the letting of projects such that clearing and grubbing can occur outside of the primary nesting season in Nebraska which has been determined to generally occur between April 1 and September 1. Work on structures, such as but not limited to bridges and culverts, should occur outside the primary swallow nesting season, April 15 to September 30, unless approved methods of avoiding nesting have been taken on the bridge and/or culvert structures. The nesting dates above are a guide only, nesting can occur outside of those dates. Work outside of those dates is not exempt from compliance with the Migratory Bird Treaty Act.

The Contractor shall, to the extent possible, schedule work on structures, such as but not limited to bridges and culverts, and clearing and grubbing activities to occur outside the primary nesting season in Nebraska. However, if circumstances dictate that project construction or demolition must be done when nesting migratory birds may be present, a survey of the number of active nests and species of birds shall be conducted by qualified personnel representing the Contractor, and assisted by the Project Manager (PM), NDOR Environmental Section staff, or the United States Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) - Wildlife Services Office. If the survey finds that nests will be impacted by the proposed construction, the Contractor may be responsible for delays.

The following guidance is provided for compliance with the Migratory Bird Treaty Act for construction of NDOR projects:

1. The Contractor shall submit a plan to the NDOR regarding how he intends to accomplish bridge demolition or clearing and grubbing of the project to avoid conflict with nesting migratory birds.
2. The Contractor must submit a temporary erosion control plan tailored to fit the plan for clearing and grubbing.
3. If construction operations result in unavoidable conflict with nesting migratory bird's eggs or young, which will result in "taking" nests and their contents, the Contractor should notify the NDOR Project Manager (PM). The PM shall notify the Environmental Section of Planning and Project Development by telephone at 402-479-4766.
4. The NDOR Environmental Section will then determine if assistance in conducting the survey will be provided by the NDOR Environmental Section (if available) or from the USDA APHIS - Wildlife Services Office and arrange for assistance with the survey of nest numbers, bird species, etc. Results of the survey shall be maintained by the NDOR until project completion.
5. If the nesting survey is required, and the project was awarded prior to the nesting season, and the Contractor did not accomplish clearing/grubbing and/or work on bridge/culvert structures outside the nesting season, the Contractor will reimburse the Department of Roads for each survey required at \$1,000 per survey. If the project was awarded during the nesting season, and construction activities are such that clearing/grubbing and/or work on bridge/culvert structures must be accomplished prior to any other activity on the project, then there will be

no charge assessed for the initial survey. The Contractor is responsible for removing all trees surveyed, that do not contain active nests, and for taking appropriate measures on bridge/culvert structures, within 3 days of the survey. Reimbursement for additional surveys may be charged if the Contractor fails to remove the trees within 3 days of the survey, and requires an additional survey. Survey reimbursement will be determined on a project specific basis, considering the project timeline and associated activities.

6. If an active nest is found during the survey, the Contractor should do everything possible to restructure his activities and leave the nest undisturbed until the young fledge. Fledging could occur within a week, or up to a month, after the survey depending on the species of bird and whether the nest contained eggs or young. Also depending on the species of bird and their sensitivity to disturbance, a buffer of up to 30 feet surrounding the tree with the active nest could be required.
7. If construction cannot be rescheduled to allow the birds to fledge, and it is determined as an unavoidable "take" circumstance, the Contractor shall stop all work within 30 feet of the active nest and coordinate with the Construction Project Manager to determine how to proceed. The Construction Project Manager will then coordinate with the NDOR Environmental Section and they will facilitate coordination with the US Fish and Wildlife Service and the Federal Highway Administration (for projects using Federal-aid) to determine the appropriate way to address the active nest. No work shall occur within 30 feet of the active nest until US Fish and Wildlife Service coordination is complete and the requirements of the Migratory Bird Treaty Act are satisfied.
8. It is the Contractor's responsibility to schedule his work to accommodate the process of conducting a survey(s) and submitting the necessary documentation if avoidance is not practicable. The Contractor shall be responsible for using any legal and practical method to prevent the nesting of birds in order to prevent the need for any survey and prevent the need for additional surveys. It is understood and agreed that the Contractor has considered in the bid all of the pertinent requirements concerning migratory birds (including endangered species) and that no additional compensation, other than time extensions if warranted, will be allowed for any delays or inconvenience resulting in these requirements.

STORM WATER DISCHARGES (A-43-0408)

In compliance with the Federal Water Pollution Control Act, authorization to discharge storm water on this project has been granted under National Pollutant Discharge Elimination System (NPDES) General NPDES Permit Number NER110000 for Storm Water Discharges from Construction Sites to Waters of the State of Nebraska. This permit became effective on January 1, 2008.

Contractors are advised that, under the Construction Storm Water General Permit, ***plant sites, camp sites, storage sites, and borrow or waste sites not shown on the plans may be subject to separate NPDES permit authorization requirements for stormwater discharges from those locations.*** Contractors shall be responsible for verifying the need for NPDES permit coverage with the Nebraska Department of Environmental Quality (NDEQ). When

required for these locations, the filing of a "Notice of Intent" shall be made by the Contractor directly to the NDEQ.

Additionally, asphalt (SIC Code 2951) or concrete (SIC Code 3273) batch plants that are owned by a private contractor and are operated on a contract-for-service basis to perform work for the Contractor completing the project may be subject to NPDES General Permit Number NER000000 for Industrial Storm Water Discharges. While the plant may be required for completion of the project, it is not under the control of the Department (or other project owner); and the filing of a "Notice of Intent" shall be made by the Contractor directly to the NDEQ.

The NDEQ may be contacted at 402-471-4220 for additional information.

REQUIRED SUBCONTRACTOR/SUPPLIER QUOTATIONS LIST (A-43-0307)

All bidders must provide to the NDOR the identity of all firms who provided quotations on all projects, including both DBEs and non-DBEs. This information must be on a form provided by the NDOR Contracts Office.

If no quotations were received, the bidder must indicate this in the space provided.

Each bidder will be required to submit one list per letting to cover all projects bid.

PROPOSAL GUARANTY BID BOND (A-43-0307)

Paragraphs 1.a. and 1.b. of Subsection 102.15 in the *Standard Specifications* are void and superseded by the following:

- a. OPTION 1 - (Project Specific Paper Bid Bond). The Bid Bond shall be executed on an original Department Bid Bond Form, which may be obtained from the Department. The original Bid Bond shall be delivered to the Department with the bid. A reproduction or a copy of the original form will not be accepted and will cause the bid not to be opened and read.
- b. OPTION 2 - (Annual Bid Bond). The Department at its discretion may allow a bidder to place an "Annual Bid Bond" on file with the Department. This bond would cover all projects the bidder bids for a 12-month period shown in the bond. The bidder must indicate in the bid submittal to the Department that their "Annual Bid Bond" applies to the submitted bid. The original Annual Bid Bond shall be executed on the Department of Roads Bid Bond Form, which may be obtained from the Department. A reproduction or a copy of the original form will not be accepted.

**WORKER VISIBILITY
(A-43-0507)**

Pursuant to Part 634, Title 23, Code of Federal Regulations, the following modified rule is being implemented:

Effective on January 1, 2008, all workers within the right-of-way who are exposed either to traffic (vehicles using the highway for purposes of travel) or to construction equipment within the work area shall wear high-visibility safety apparel.

High-visibility safety apparel is defined to mean personal protective safety clothing that:

- 1 - is intended to provide conspicuity during both daytime and nighttime usage, and
- 2 - meets the Performance Class 2 or Class 3 requirements of the ANSI/ISEA 107-2004 publication titled "American National Standards for High-Visibility Safety Apparel and Headwear."

**VALUE ENGINEERING PROPOSALS (VEP)
(A-43-0807)**

Subsection 104.03 in the *Standard Specifications* is amended to include the following:

14. A VEP will not be accepted if the proposal is prepared by an Engineer or the Engineering Firm who designed the contract plans.

**LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC
(A-43-0210)**

Paragraph 4.a. of Subsection 107.01 in the *Standard Specifications* is void and superseded by the following:

4. a. Whenever the Contractor violates any governing Federal, State or Local environmental quality regulation and/or is in noncompliance with any environmental commitment, the violating activity must cease immediately until the appropriate remedy can be determined by: the Engineer, the NDOR Environmental Section, the Federal Highway Administration (for projects utilizing Federal-aid) and other agencies, as deemed appropriate. The Engineer, with assistance from the NDOR Environmental Section and the FHWA, will provide a written order confirming the appropriate corrective action to the Contractor. Work can resume to normal conditions once the Engineer determines that the violation or non-compliance has been addressed in accordance with the order for corrective action.

Subsection 107.01 in the *Standard Specifications* is amended to include the following two paragraphs:

5. Should the Contractor encounter any previously unidentified hazardous materials, the Engineer shall be promptly notified. The Contractor shall suspend operations in the area involved until such time that arrangements are made for their proper treatment or removal.
6. The Contractor shall prevent the transfer of invasive plant and animal species. The Contractor shall wash equipment at the Contractor's storage facility prior to entering the construction site. The Contractor shall inspect all construction equipment and remove all attached vegetation and animals prior to leaving the construction site.

**SPECIAL PROSECUTION AND PROGRESS
(Federal Immigration Verification System)
(A-43-1209)**

The Contractor shall register with and use a Federal Immigration Verification System to determine the work eligibility status of newly hired employees physically performing services within the State of Nebraska. The Prime Contractor shall contractually require every subcontractor to register with and use a Federal Immigration Verification System to determine the work eligibility status of newly hired employees physically performing services within the State of Nebraska.

The Federal Immigration Verification System shall be an electronic verification of the work authorization program of the Illegal Immigration Reform and Immigration Responsibility Act of 1996, 8 U.S.C. 1324a, known as the E-Verify Program. The Contractor may use an equivalent Federal program designated by the United States Department of Homeland Security or other Federal agency authorized to verify the work eligibility status of a newly hired employee. The equivalent program shall comply with the Immigration Reform and Control Act of 1986.

The Prime Contractor shall furnish a letter to the NDOR Construction Division in Lincoln on company letterhead and signed by an officer of the company stating that documentation is on file certifying that the Contractor and all subcontractors have registered with and used a Federal Immigration Verification System. The Contractor shall maintain all records of registration and use for a period of three years and make records available upon request. The Contractor shall contractually require subcontractors to maintain all records for a period of three years and make records available upon request.

Payment will not be made to the Contractor for using the Federal Immigration Verification System or the maintenance of the records. This work shall be subsidiary to the work being performed.

The Contractor's Certification shall become part of the final records of the Contract. The Department considers this document to have direct bearing to the beginning interest date and may affect the amount of interest earned.

**CONTRACT TIME ALLOWANCE
(A-43-0911)**

Paragraph 5. of Subsection 108.02 of the *Standard Specifications* is void and superseded by the following:

5. Each week, the Engineer shall post on the Department's website a report of working days or calendar days charged. The Contractor then has 14 days from the day the Engineer's report is posted to provide a written explanation of why he/she does not concur with the working days or calendar days as assessed.

Paragraph 6.b. of Subsection 108.02 of the *Standard Specifications* is amended to include the following:

- (4) If the time allowance for the contract has been established on a calendar day basis, the Contractor is expected to schedule the work and assign whatever resources are necessary to complete the work in the time allowance provided regardless of the weather. Accordingly, regardless of anything to the contrary contained in these *Specifications*, the Department will not consider delays caused by inclement or unseasonable weather as justification for an extension of the contract time allowance unless:
 - i. the weather phenomena alleged to have contributed to or caused the delay is of such magnitude that it results in the Governor issuing a Disaster Declaration, **and**
 - ii. the weather phenomena alleged to have contributed to or caused the delay can clearly be shown to have directly impacted the work on the critical path identified on the Contractor's schedule.

Paragraphs 10.b. and 10.c. of Subsection 108.02 of the *Standard Specifications* are void and superseded by the following:

- b.
 - (1) If the extra work is not in the original contract, time extensions will be granted by determining the actual time necessary to accomplish the extra work.
 - (2) If the extra work is the result of the addition of additional quantities of existing contract items, time extensions will be granted by either:
 - (i) determining the actual time necessary to accomplish the extra work; or
 - (ii) determining the additional time to be granted by comparing the value of the additional quantities of work to the total amount of the original contract when measurement of the actual additional time is not possible or practical.
 - (3) In either case, only the time necessary to perform the extra work of the additional quantities of existing contract items when the extra work or the additional quantities of existing contract items are deemed to be the current controlling operation will be granted as a time extension.

- c. Increases in quantities of work associated with traffic control items measured by the day will not be considered for extending the contract time allowance. Overruns of traffic control items that are measured by methods other than time may be considered for extending the contract time allowance, but they must be deemed to be a controlling operation when the overrun of quantities occurs.

**PARTIAL PAYMENT
(A-43-1110)**

Paragraph 2. of Subsection 109.07 of the *Standard Specifications* is void and superseded by the following:

- 2. When the value of the work completed during a semi-monthly period exceeds \$10,000, the Contractor will receive semi-monthly progress estimates from which the Department shall make such retentions as may be allowed by the contract, provided that the nature and quality of the completed work are satisfactory and provided further that the progress of the work conforms to the requirements of Subsection 108.07.

Paragraph 3.b. of Subsection 109.07 of the *Standard Specifications* is void and superseded by the following:

- b. Under normal circumstances, the Department shall not retain any earnings on a progress estimate. However, the Department reserves the right to retain such amounts as are necessary for material deficiencies, anticipated liquidated damages, unpaid borrow, and for other reasons to protect the Department's interests.

**PARTIAL PAYMENT
(A-43-0611)**

Paragraph 4. of Subsection 109.07 of the *Standard Specifications* is void and superseded by the following:

- 4. a. (1) Upon presentation by the Contractor of receipted bills, billing invoices, or such other documentation sufficient to satisfy the Engineer and verify the Contractor's or subcontractor's actual costs for the materials, payments may also be allowed for acceptable nonperishable materials purchased expressly to be incorporated into the work and delivered in the vicinity of the project or stored in acceptable storage places within Nebraska.
- (2) Materials not delivered and stored in the immediate vicinity of or on the actual project site must be clearly marked to identify the project on which they are to be used, must be segregated from similar materials at the storage site, and cannot be included in a supplier's inventory of material available for sale for other purposes.
- (3) All items eligible for partial payment as stored materials must be available for verification, sampling, and measurement.

- b. The amount to be included in the payment will be determined by the Engineer, but in no case shall it exceed 100 percent of the value of the materials documented. This value may not exceed the appropriate portion of the value of the contract item or items in which such materials are to be incorporated, nor shall the quantity in any case exceed the total estimated quantity required to complete the project.
- c. Payment will not be approved when the documented value of such materials amounts to less than \$1,000.00, when the progress of the work is not in accordance with the requirements set forth in Subsection 108.07, or when the material can reasonably be expected to be incorporated into the work and eligible for payment as completed work on a progress estimate within 15 days of being placed into storage.
- d. Deductions at rates and in amounts which are equal to the payments will be made from estimates as the materials are incorporated into the work.
- e. Payment for the materials shall not in itself constitute acceptance, and any materials which do not conform to the specifications shall be rejected in accordance with Subsection 106.05.
- f. The Contractor shall be responsible for all damages and material losses until the material is incorporated into the work and the work is accepted.
- g. Partial payment will not include payment for fuels, supplies, form lumber, falsework, other materials, or temporary structures of any kind which will not become an integral part of the finished construction.
- h. No partial payments will be made on living or perishable plant materials until planted.

**BUY AMERICA
(A-43-0212)**

Subsection 106.07 in the *Standard Specifications* is void and superseded by the following:

106.07 -- Buy America

- 1. The Buy America rule requires that steel or iron materials be produced domestically, and only those products which are brought to the construction site and permanently incorporated into the completed project are covered. Construction materials, forms, etc., which remain in place at the Contractor's convenience, but are not required by the contract, are not covered.
- 2. To further define the coverage, a domestic product is a manufactured steel construction material that was produced in one of the 50 States, the District of Columbia, Puerto Rico, or in the territories and possessions of the United States.
- 3. All manufacturing processes to produce steel or iron materials (i.e., smelting, and any subsequent process which alters the steel or iron material's physical form or

shape, or changes its chemical composition) must occur within one of the 50 States, the District of Columbia, Puerto Rico, or in the territories and possessions of the United States, to be considered of domestic origin. This includes processes such as casting, rolling, extruding, machining, bending, grinding, drilling, and coating. Coating includes epoxy coating, galvanizing, painting, and any other coating that protects or enhances the value of the material. The manufacturer shall include a statement on the material test report or certification that all material described above except the coating material is a domestic product.

4. Raw materials used in the steel or iron materials may be imported. All manufacturing processes to produce steel or iron materials must occur domestically. Raw materials are materials such as iron ore, limestone, waste products, etc., which are used in the manufacturing process to produce the steel products. Waste products would include scrap; i.e., steel no longer useful in its present form from old automobiles, machinery, pipe, railroad tracks and the like. Also, steel trimmings from mills or product manufacturing are considered waste. Extracting, crushing, and handling the raw materials which is customary to prepare them for transporting are exempt from Buy America. The use of pig iron and processed, pelletized, and reduced iron ore manufactured outside of the United States may be used in the domestic manufacturing process for steel and/or iron materials.
5. Notwithstanding this requirement, a minimum of foreign steel or iron materials will be permitted if its value is less than one-tenth of one percent of the total contract cost or \$2,500, whichever is greater.
6. Upon completion of all work utilizing steel or iron products, the Prime Contractor shall furnish a letter to the State on company letterhead and signed by an officer of the company stating that documentation is on file certifying that all steel or iron materials brought to the construction site and permanently incorporated into the work complied in all respects with the Buy America requirements.

BORROW, WASTE, STOCKPILE, AND PLANT SITE APPROVAL (A-43-0512)

Subsection 107.02 in the Standard Specifications is amended to include the following:

4. Site Approval:
 - a. When borrow is obtained from a borrow site or waste excavation is placed at sites which are not shown in the contract, or the Contractor plans to use a plant or stockpile site which is not shown in the contract, the Contractor shall be solely responsible for obtaining all necessary site approvals. The Department will provide the procedures necessary to obtain approvals from the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, Nebraska State Historical Society, Nebraska Game and Parks Commission, and Nebraska Department of Natural Resources on the NDOR website. The Contractor shall also be responsible for obtaining a Discharge Number from the Nebraska Department of Environmental Quality (NDEQ) that allows work under the current

Construction Stormwater Permit. The Contractor shall also be responsible for obtaining any and all other permits required by local governments.

- b. It is anticipated that it may require 60 calendar days or more for the Contractor to obtain the necessary approvals. The Contractor will not be allowed to begin work at borrow or waste sites until the necessary approvals are obtained. No extension of completion time will be granted due to any delays in securing approval of a borrow or disposal site unless a review of the time frames concludes that there were conditions beyond the Contractor's control.

Paragraph 7. of Subsection 205.02 in the Standard Specifications is void and superseded by the following:

- 7. Borrow and Waste Site Approval:
 - a. Borrow and waste site approvals shall be in accordance with Section 107.02.
 - b. Material shall not be removed from borrow sites until preliminary cross sections and representative soil samples have been taken by the Engineer. The Contractor shall notify the Engineer a sufficient time in advance of the opening of any borrow site so that cross sections may be taken.
 - c. Material shall be removed in a manner that will allow accurate final cross sections to be taken for determining the quantity of excavation. The surfaces of the borrow sites shall be bladed and shaped to drain as shown in the contract or as directed by the Engineer.

**SPECIAL PROSECUTION AND PROGRESS
(Subletting or Assigning of Contract)
(A-43-0414)**

Subsection 108.01 in the Standard Specifications is void and superseded by the following:

108.01 – Subletting or Assigning of Contract

- 1. a. (1) The Contractor will not be allowed to sublet, assign, sell, transfer, or otherwise dispose of any portion of the contract or any right, title, or interest therein; or to either legally or equitably assign any of the money payable under the contract or the claims without the prior written consent of the Engineer.
- (2) With the Engineer's consent, the Contractor may sublet up to 70 percent of the work.
- (3) Any items designated in the contract as "specialty items" may be performed by subcontract.

- (4) The cost of any subcontracted “specialty items” may be deducted from the total contract cost before computing the percentage of work required to be performed by the Contractor.
 - (5) Subcontracts, or transfer of contract, will not release the Contractor of any liability under the contract and bonds.
 - b. Certain items of work may be performed without a subcontract. A list of items not requiring a subcontract is available from the Engineer.
2. The performance of any work by a subcontractor before the date of authorization by the Department shall subject both the Contractor and subcontractor to the imposition of appropriate sanctions by the Department.
3. a. The Contractor’s request to sublet work shall be made electronically to the NDR Construction Engineer using project management software identified by the Department. A signed subcontract agreement shall be on file in the Contractor’s office when the request is made. The subcontract agreement must provide that the subcontracted work will be completed according to the terms of the contract. The required and Special Provisions contained in the proposal shall be physically included in any subcontract.
 - b. On all Federal-aid projects, a scanned copy (.pdf format) of the signed subcontract agreement shall be included with the subcontracting request. (Federal-aid projects can be identified by inclusion in the Proposal of Form FHWA-1273 (REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS)).**
 - c. Scanned copies (.pdf format) of all executed subcontracts, written agreements, and/or lease agreements used to meet DBE goals shall be submitted to the NDR Construction Engineer with the subcontracting request. These copies must show labor cost, material prices, overhead and profit.
4. a. Second tier subcontracts will be allowed.
 - b. If a DBE firm subcontracts work to another firm, only work subcontracted to another DBE firm can be counted toward meeting a DBE goal.
 - c. All requests for second tier subcontracting shall be submitted to and approved by the Prime Contractor before they are forwarded to the NDR Construction Engineer for approval.
5. All subcontract documents relating to the contract shall be maintained during the course of the work and preserved for a period of three years thereafter. These documents shall be available for inspection by authorized representatives of State and Federal agencies. Scanned copies (.pdf format) of the signed subcontract agreements not specifically identified elsewhere in this Subsection shall be furnished to the Department upon request.
6. The Contractor may discuss a proposed subcontract with the Engineer before entering into a signed subcontract agreement, but final approval will not be

granted until a formal request and proper certification has been received by the Department.

7. On projects requiring submittal of certified payrolls, all subcontractor payrolls shall be checked by the Contractor before submittal to the Engineer.
8. a. The Prime Contractor, and subcontractors when subletting work to lower tier subcontractors, shall include language which can be identified as a "Prompt Payment Clause" as a part of every subcontract for work and materials.
 - b. (1) The language constituting the "Prompt Payment Clause" will require payment to all first tier subcontractors for all labor and materials --- for work completed to date --- within 20 calendar days of receipt of progress payments from the Department for said work. Similar language in a contract between a subcontractor and a lower-tier subcontractor will require payment to the lower tier subcontractor for all labor and materials --- for work completed to date --- within 10 calendar days of receipt of progress payments from the prime Contractor for said work.
 - (2) The language constituting the "Prompt Payment Clause" will also stipulate the return of retainage within 30 calendar days after the satisfactory completion of the work by the subcontractor as evidenced by inclusion of the work on a progress payment.
 - (3) Additionally, the language constituting the "Prompt Payment Clause" may stipulate the subcontractor's obligation to return to the Contractor or subcontractor, as the case may be, any overpayments which result from adjustments to measured and recorded quantities as part of the preparation of subsequent progress payments or the final records. Overpayments shall be returned to the Prime Contractor or subcontractor, as the case may be, within 20 calendar days of receiving notice of the adjusted quantities and the amount of the overpayment.
- c. The Prime Contractor of subcontractors, as the case may be, may withhold payment only for just cause and shall not withhold, delay, or postpone payment without first receiving written approval from the Department.
- d. (1) The failure by the Prime Contractor to abide by the agreements identified in the "Prompt Payment Clause" without just cause, including the timely return of retainage, is a material breach of this contract which may result in the Department withholding the amount of payment from the prime Contractor that should have been paid to the subcontractor, termination of this contract, or other such remedy as the Department deems necessary.
 - (2) Additionally, the failure of any subcontractor to abide by the agreements identified in the "Prompt Payment Clause" without just cause, including the timely return of retainage to lower tier subcontractors, or by failing to return overpayments in a timely manner when the language permitted in Paragraph 8.b.(3) above is included in the subcontract may result in the Department withholding subcontract approval for other work until the overpayments have been returned.

9. a. (1) For Davis Bacon (DBRA)-covered projects and Non-DBRA-covered projects, a Contractor or subcontractor may wish to use another individual owner-operator or trucking company to supplement his or her hauling fleet. (The Department will not recognize multiple individuals claiming to be collectively identified as a single "owner operator.")
- (2) This supplemental individual or company must either become a subcontractor (first tier or lower tier, as the case may be) or be otherwise documented by the utilizing Contractor or subcontractor by entering into a lease agreement for the trucks and showing the driver (or drivers) from the supplemental company on the Prime Contractor's or subcontractor's payrolls in the manner described below.
- (3) Payrolls will only be accepted from the Prime Contractor or approved subcontractors.
- b. (1) If the decision is made to subcontract the hauling, the Prime Contractor must first notify the NDOR Construction Office to request subcontract approval. As part of the subcontract approval process --- at any tier --- the proper certificates of insurance must be provided before approval will be granted.
- (2) Additionally, on DBRA-covered projects, the Prime Contractor must submit payrolls for all subcontractors --- at any tier.
- c. (1) Owner/Operators of trucks hired by a Contractor or subcontractor to supplement his or her hauling fleet are not subject to Davis Bacon wage requirements. However, they must still be shown on a payroll prepared by the Contractor or subcontractor for whom they are working with the notation "owner/operator."
- (2) Any other employees of the "owner/operator" must appear on the certified payroll in complete detail and must be compensated according to the wage rates established for the project.
- d. In the event a Prime Contractor or subcontractor elects to not subcontract the supplemental driver or drivers but instead chooses to "carry the workers/truckers on their payroll," the following requirements must be met:
 - (1) The Prime Contractor's or subcontractor's certified payroll must contain the names of all workers/truck drivers, and the payroll should identify their supervisors (including "owner-operators").
 - (2) Pay checks for the workers/truckers in question must be drawn against the Prime Contractor's or subcontractor's payroll or other account.
 - (3) Owner/Operators need only be identified as such on the payroll. Additional drivers, if any, from the "owner-operator's" company must appear on a payroll in complete detail and be compensated according to the wage rates established for the project.
 - (4) The Prime Contractor or subcontractor must enter into a lease agreement for the trucks driven by such drivers, and the lease agreement must show

that the compensation for the leased equipment is on a time basis and not based on the amount of work accomplished. The lease agreements must be available for inspection by NDOR personnel.

- (5) Any supplemental truckers employed under this arrangement must still carry the minimum automobile liability coverage specified in the contract. It shall be the duty of the Prime Contractor to ensure that the supplemental truckers have such coverage in effect. Evidence of proper insurance must be presented for verification on demand.

ELECTRONIC SHOP DRAWINGS (A-43-0215)

Paragraphs 5, 6, and 7 of Subsection 105.02 of the Standard Specifications are void and superseded by the following:

5. a. The Contractor shall provide electronic working drawings in a Portable Document Format (PDF). The PDFs shall be sized to print on an 11x17 inch sheet of paper and have a minimum resolution of 300 dpi. Each sheet of the shop drawings shall have a space provided for an electronic stamp that measures 2.5 inches x 3.5 inches when printed.
- b. Electronic working drawing files shall be named with the following file naming format:

Control Number_Brief Description_Date.pdf

For example: 12345_FloorDrains_05Feb2015
 12345_FloorDrainCoverLetter_05Feb2015
- c. The project number, control number, and project location as it appears on the plans shall be shown on the front sheet of each Shop Drawing file. Structure numbers shall be included, if applicable.
6. No electronic working drawings shall be submitted to the Engineer unless they have been checked by the Contractor. The electronic submittal shall be accompanied by a Contractor's letter of approval in a PDF format. This letter shall also be named with the format shown in the example above. The letter of approval shall clearly indicate that the Contractor is responsible for any errors on the working drawings.
7. a. Electronic submittals shall be submitted by email to the following address:

DOR.ShopDrawings@nebraska.gov
- b. Attachments shall be limited to 25 MB of data per email. Larger files shall be separated and sent in multiple emails.
- c. Electronic working drawings will only be accepted from the Prime Contractor.
8. Any reference to hard copy shop drawings in the contract shall be considered void.

BNSF RAILWAY COMPANY
BNSF RAILWAY SPECIAL PROVISIONS
FOR PROJECTS FOR HIGHWAY IMPROVEMENTS

1. CONTRACTOR REQUIREMENTS

1.1 General

1.1.1 The Contractor must cooperate with **BNSF RAILWAY COMPANY**, hereinafter referred to as "Railway" where work is over or under on or adjacent to Railway property and/or right-of-way, hereafter referred to as "Railway Property", during the construction of South Omaha Veterans Memorial Bridge.

1.1.2 Contractor shall have a background investigation performed on all of its employees, subcontractors and agents who will be performing any services for Railroad under this Agreement which are determined by Railroad in its sole discretion a) to be on Railroad's property, or b) that require access to Railroad Critical Infrastructure, Railroad Critical Information Systems, Railroad's Employees, Hazardous Materials on Railroad's property or is being transported by or otherwise in the custody of Railroad, or Freight in Transit involving Railroad.

The required background screening shall at a minimum meet the rail industry background screening criteria defined by the e-RAILSAFE Program as outlined at <http://www.e-railsafe.com>, in addition to any other applicable regulatory requirements.

Contractor shall obtain written consent from all its employees, subcontractors or agents screened in compliance with the e-RAILSAFE Program to participate in the Program on their behalf and to release completed background information to Railroad's designee. Contractor shall be subject to periodic audit to ensure compliance.

Contractor subject to the e-RAILSAFE Program hereunder shall not permit any of its employees, subcontractors or agents to perform services hereunder who are not first approved under e-RAILSAFE Program standards. Railroad shall have the right to deny entry onto its premises or access as described in this section above to any of Contractor's employees, subcontractors or agents who do not display the authorized identification badge issued by a background screening service meeting the standards set forth in the e-RAILSAFE Program, or who in Railroad's opinion, which may not be unreasonable, may pose a threat to the safety or security of Railroad's operations, assets or personnel.

Contractors shall be responsible for ensuring that its employees, subcontractors and agents are United States citizens or legally working in the United States under a lawful and appropriate work VISA or other work authorization.

1.1.3 The Contractor is responsible for determining and complying with all Federal, State and Local Governmental laws and regulations, including, but not limited to environmental laws and regulations (including but not limited to the Resource Conservation and Recovery Act, as amended; the Clean Water Act, the Oil Pollution Act, the Hazardous Materials Transportation Act, CERCLA), and health and safety laws and regulations. The Contractor hereby indemnifies, defends and holds harmless Railway for, from and against all fines or penalties imposed or assessed by Federal, State and Local Governmental Agencies against the Company which arise out of Contractor's work under this Agreement.

1.1.4 Except as otherwise agreed to between Railway and State, the Contractor must notify the (State) at (402) 595-2534 and Railway's Manager of Public Projects; telephone number (913) 551-4964 at least thirty (30) calendar days before commencing any work on Railway Property. Contractor's notification to Railway must refer to Railroad's file DOT #074670W, RRMP 13.520.

1.1.5 For any false work above any tracks, any excavations located within twenty-five (25) feet of the nearest track, and any intersecting slope from the plane of the top of rail on a 1½ horizontal to 1 vertical slope beginning at eleven (11) feet from centerline of the nearest track, both measured perpendicular to centerline of track, the Contractor must furnish the Railway five sets of working drawings showing details of construction affecting Railway Property and tracks. The working drawing must include the proposed method of installation and removal of false work, shoring or cribbing, not included in the contract plans and two sets of structural calculations of any false work, shoring or cribbing. All calculations must take into consideration Railway surcharge loading and must be designed to meet American Railway Engineering and Maintenance-of-Way Association (previously known as American Railway Engineering Association) Coopers E-80 live loading standard. All drawings and calculations must be stamped by a registered professional Engineer licensed to practice in the state the project is located. The Contractor must not begin work until notified by the Railway that plans have been approved. The Contractor will be required to use lifting devices such as, cranes and/or winches to place or to remove any false work over Railway's tracks. In no case will the Contractors be relieved of responsibility for results obtained by the implementation of said approved plans.

1.1.6 Subject to the movement of Railway's trains, Railway will cooperate and make reasonable effort to assist the Contractor so that the work may be handled and performed in an efficient manner. The Contractor will have no claim whatsoever for any type of damages or for extra or additional compensation in the event his work is delayed by necessary Railway operations.

1.2 Contractor Safety

1.2.1 No employee of the Contractor, its subcontractors, agents or invitees may enter Railway Property without first having completed Railway's Engineering Contractor Safety Orientation, found on the web site **www.contractororientation.com**. The Contractor must ensure that each of its employees, subcontractors, agents or invitees completes Railway's Engineering Contractor Safety Orientation through Internet sessions before any work is performed on the Project. Additionally, the Contractor must ensure that each and every one of its employees, subcontractors, agents or invitees possesses a card certifying completion of the Railway Contractor Safety Orientation before entering Railway Property. The Contractor is responsible for the cost of the Railway Contractor Safety Orientation. The Contractor must renew the Railway Contractor Safety Orientation annually. Further clarification can be found on the web site or from the Railway's Representative.

1.2.2 Each Contractor that will perform work within 25 feet of the centerline of a track must develop and implement a Roadway Worker Protection/On Track Safety Program and work with Railway Project Representative to develop an on-track safety strategy as described in the guidelines listed in the on track safety portion of the Safety Orientation. This Program must provide Roadway Worker protection/on-track training for all employees of the Contractor, its subcontractors, agents or invitees. This training is reinforced at the job site through job safety briefings. Additionally, each Contractor must develop and implement the Safety Action Plan, as provided for on the web site **www.contractororientation.com**, which will be made available to Railway prior to commencement of any work on Railway Property. During the performance of

Railway prior to commencement of any work on Railway Property. During the performance of work, the Contractor must audit its work activities. The Contractor must designate an on-site project Supervisor who will serve as the contact person for the Railway and who will maintain a copy of the Safety Action Plan, safety audits, and Material Safety Datasheets (MSDS), at the job site.

1.3 Railway Requirements

1.3.1 The Contractor must take protective measures as are necessary to keep Railway facilities, including track ballast, free of sand, debris and other foreign objects and materials resulting from his operations. The Railway shall notify the Contractor of any damage to the Railway facilities resulting from Contractor's operations. The Railway will repair such damages and the cost of such repairs or replacement must be paid for by the Contractor.

1.3.2 The Contractor must notify the Railway's Division Superintendent and provide blasting plans to the Railway for review seven (7) calendar days prior to conducting any blasting operations adjacent to or on Railway's Property.

1.3.3 The Contractor must abide by the following clearances during construction:

- ◆ 25'-0" Horizontally from centerline of nearest track
- ◆ 23'-31/2" Vertically above top of rail (Temporary False work Clearance may be reduced to 21'-6" subject to Railway approval)
- ◆ 27'-0" Vertically above top of rail for electric wires carrying less than 750 volts
- ◆ 28'-0" Vertically above top of rail for electric wires carrying 750 volts to 15,000 volts
- ◆ 30'-0" Vertically above top of rail for electric wires carrying 15,000 volts to 20,000 volts
- ◆ 34'-0" Vertically above top of rail for electric wires carrying more than 20,000 volts

1.3.4 Any infringement within the clearances provided above due to the Contractor's operations must be submitted to Railway and must not be undertaken until approved in writing by the Railway. No extra compensation will be allowed in the event the Contractor's work is delayed pending Railway approval.

1.3.5 The details of construction affecting the Railway's property and tracks not included in the contract plans must be submitted to the Railway by the Contractor for approval before work is undertaken and this work must not be undertaken until approved by the Railway.

1.3.6 At other than public road crossings, the Contractor must not move any equipment or materials across Railway's tracks until permission has been obtained from the Railway. The Contractor must obtain a "Temporary Private Crossing Agreement" (substantially in the form of Exhibit "F" of this agreement and in the form hereof) from the Railway prior to moving his equipment or materials across the Railway's tracks. The temporary crossing must be gated and locked at all times when not required for use by the Contractor. The temporary crossing for use of the Contractor will be at the expense of the Contractor.

1.3.7 Discharge, release or spill on the Railway Property of any hazardous substances, oil, petroleum, constituents, pollutants, contaminants or any hazardous waste is prohibited and Contractor must immediately notify the Railway's Resource Operations Center at 1-(800) 832-5452, of any discharge, release or spills in excess of a reportable quantity.

Contractor must not allow Railway Property to become a treatment, storage or transfer facility as those terms are defined in the Resource Conservation and Recovery Act or any similar State law.

1.3.8 In the event the Contractor shall in any manner move or disturb other property of the Railway, in connection with the use of the said property, then, and in that event, the Contractor shall, as soon as possible and at its sole expense, restore such property to the same condition as it was in before such property was moved or disturbed.

1.3.9 In addition to Subsection 104.08 of the Standard Specification, the Contractor upon completion of the work covered by this contract, must promptly remove from the Railway's Property all of Contractor's tools, equipment, implements and other materials whether brought upon said property by said Contractor or any Subcontractor, employee or agent of Contractor or of any Subcontractor, and must cause Railway's Property to be left in a condition acceptable to the Railway's representative.

1.4 Protection of Railway Facilities and Railway Flagger Services:

1.4.1 The Contractor must give Railway's Roadmaster Russ Wideo (telephone (402) 422-5249) a minimum of thirty (30) calendar days advance notice when flagging services will be required so that the Roadmaster can make appropriate arrangements (i.e., bulletin the flagger's position). If flagging services are scheduled in advance by the Contractor and it is subsequently determined by the parties hereto that such services are no longer necessary, the Contractor must give the Roadmaster five (5) working days advance notice so that appropriate arrangements can be made to abolish the position pursuant to Union requirements.

1.4.2 Unless determined otherwise by Railway's Project Representative, Railway flagger and protective services and devices will be required and furnished when Contractor's work activities are located over, under and/or within twenty-five (25) feet measured horizontally from centerline of the nearest track and when cranes or similar equipment positioned beyond 25-feet from the track centerline could foul the track in the event of tip over or other catastrophic occurrence, but not limited thereto for the following conditions:

- a-** When in the opinion of the Railway's Representative it is necessary to safeguard Railway's Property, employees, trains, engines and facilities.
- b-** When any excavation is performed below the bottom of tie elevation, if, in the opinion of Railway's representative, track or other Railway facilities may be subject to movement or settlement.
- c-** When work in any way interferes with the safe operation of trains at timetable speeds.
- d-** When any hazard is presented to Railway track, communications, signal, electrical or other facilities either due to persons, material, equipment or blasting in the vicinity.
- e-** Special permission must be obtained from the Railway before moving heavy or cumbersome objects or equipment which might result in making the track impassable.
- f-** Flagging services will be performed by qualified Railway flaggers.

- g-** A flagging crew generally consists of one employee. However, additional personnel may be required to protect Railway Property and operations, if deemed necessary by the Railway Representative.
- h-** Each time a flagger is called, the minimum period for billing will be the eight (8) hour basic day.

1.4.3 The cost of flagger services provided by the Railway, when deemed necessary by the Railway's representative, will be borne by the Contractor. The estimated cost for one (1) flagger is \$1,600.00/10 hr/day for an eight (8) hour basic day with time and one-half or double time for overtime, rest days and holidays. The estimated cost for each flagger includes vacation allowance, paid holidays, Railway and unemployment insurance, public liability and property damage insurance, health and welfare benefits, transportation, meals, lodging and supervision. Negotiations for Railway labor or collective bargaining agreements and rate changes authorized by appropriate Federal authorities may increase actual or estimated flagging rates. The flagging rate in effect at the time of performance by the Contractor hereunder will be used to calculate the actual costs of flagging pursuant to this paragraph.

1.4.4 The average train traffic on this route is 0 freight trains per 24-hour period at a timetable speed N/A MPH and 2 passenger trains at a timetable speed of 60 MPH.

1.5 Contractor General Safety Requirements

1.5.1 Work in the proximity of Railway track(s) is potentially hazardous where movement of trains and equipment can occur at any time and in any direction. All work performed by Contractors within 25 feet of any track must be in compliance with FRA Roadway Worker Protection Regulations.

1.5.2 Before beginning any task on Railway Property, a thorough job safety briefing must be conducted with all personnel involved with the task and repeated when the personnel or task changes. If the task is within 25 feet of any track, the job briefing must include the Railway's flagger, as applicable, and include the procedures the Contractor will use to protect its employees, subcontractors, agents or invitees from moving any equipment adjacent to or across any Railway track(s).

1.5.3 Workers must not work within 25 feet of the centerline of any track without an on-track safety strategy approved by the Railway's Project Representative. When authority is provided, every Contractor employee must know: (1) who the Railway flagger is, and how to contact the flagger, (2) limits of the authority, (3) the method of communication to stop and resume work, and (4) location of the designated places of safety. Persons or equipment entering flag/work limits that were not previously job briefed, must notify the flagger immediately, and be given a job briefing when working within 25 feet of the centerline of track.

1.5.4 When Contractor employees are required to work on the Railway Property after normal working hours or on weekends, the Railroad's representative in charge of the project must be notified. A minimum of two employees must be present at all times.

1.5.5 Any employees, agents or invitees of Contractor or its subcontractors under suspicion of being under the influence of drugs or alcohol, or in the possession of same, will be removed from the Company's Property by Contractor and subsequently released to the custody of a

representative of Contractor management. Future access to the Railway's Property by that employee will be denied.

1.5.6 Any damage to Railway Property, or any hazard noticed on passing trains must be reported immediately to the Railway's representative in charge of the project. Any vehicle or machine which may come in contact with track, signal equipment, or structure (bridge) and could result in a train derailment must be reported immediately to the Railway representative in charge of the project and to the Railway's Resource Operations Center at 1(800) 832-5452. Local emergency numbers are to be obtained from the Railway representative in charge of the project prior to the start of any work and must be posted at the job site.

1.5.7 For safety reasons, all persons are prohibited from having pocket knives, firearms or other deadly weapons in their possession while working on Railway's Property.

1.5.8 All personnel protective equipment (PPE) used on Railway Property must meet applicable OSHA and ANSI specifications. Current Railway personnel protective equipment requirements are listed on the web site, www.contractororientation.com, however, a partial list of the requirements include: a) safety glasses with permanently affixed side shields (no yellow lenses); b) hard hats c) safety shoe with: hardened toes, above-the ankle lace-up and a defined heel; and d) high visibility retro-reflective work wear. The Railroad's representative in charge of the project is to be contacted regarding local specifications for meeting requirements relating hi-visibility work wear. Hearing protection, fall protection, gloves and respirators must be worn as required by State and Federal regulations. **(NOTE – Should there be a discrepancy between the information contained on the web site and the information in this paragraph, the web site will govern.)**

1.5.9 The Contractor must not pile or store any materials, machinery or equipment closer than 25'-0" to the centerline of the nearest Railway track. Materials, machinery or equipment must not be stored or left within 250 feet of any highway/rail at-grade crossings, where storage of the same will interfere with the sight distances of motorists approaching the crossing. Prior to beginning work, the Contractor must designate any proposed areas with concurrence of the Railroad's representative.

1.5.10 Machines or vehicles must not be left unattended with the engine running. Parked machines or equipment must be in gear with brakes set and if equipped with blade, pan or bucket, they must be lowered to the ground. All machinery and equipment left unattended on Railway's Property must be left inoperable and secured against movement. (See Internet Engineering Contractor Safety Orientation program for more detailed specifications)

1.5.11 Workers must not create and leave any conditions at the work site that would interfere with water drainage. Any work performed over water must meet all Federal, State and Local regulations.

1.5.12 All power line wires must be considered dangerous and of high voltage unless informed to the contrary by proper authority. For all power lines the minimum clearance between the lines and any part of the equipment or load must be; 200KV or below – 15 feet; 200 to 350 KV – 20 feet; 350 to 500 KV – 25 feet; 500 to 750 KV – 35 feet; and 750 to 1000 KV – 45 feet. If capacity of the line is not known, a minimum clearance of 45 feet must be maintained. A person must be designated to observe clearance of the equipment and give a timely warning for all operations where it is difficult for an operator to maintain the desired clearance by visual means.

1.6 Excavation

1.6.1 Before excavating, the Contractor must investigate to determine whether any underground pipe lines, electric wires, or cables, including fiber optic cable systems are present and located within the Project work area. The Contractor must determine whether excavation on Railway's Property could cause damage to buried cables resulting in delay to Railway traffic and disruption of service to users. Delays and disruptions to service may cause business interruptions involving loss of revenue and profits. Before commencing excavation, the Contractor must contact Railway's Field Engineering Representative John Caldwell (913) 551-4564. All underground and overhead wires will be considered HIGH VOLTAGE and dangerous until verified with the company having ownership of the line. It is the Contractor's responsibility to notify any other companies that have underground utilities in the area and arrange for the location of all underground utilities before excavating.

1.6.2 The Contractor must cease all work and notify the Railway immediately before continuing excavation in the area if obstructions are encountered which do not appear on drawings. If the obstruction is a utility and the owner of the utility can be identified, then the Contractor must also notify the owner immediately. If there is any doubt about the location of underground cables or lines of any kind, no work must be performed until the exact location has been determined. The Railway will grant no exceptions to the requirements of this section.

1.6.3 All excavations must be conducted in compliance with applicable OSHA regulations and, regardless of depth, must be shored where there is any danger to tracks, structures or personnel.

1.6.4 Any excavations, holes or trenches on the Railway's Property must be covered, guarded and/or protected when not being worked on. When leaving work site areas at night and over weekends, the areas must be secured and left in a condition that will ensure that Railway employees and other personnel who may be working or passing through the area are protected from all hazards. All excavations must be back filled as soon as possible.

1.7 Hazardous Waste, Substances and Material Reporting

1.7.1 If Contractor discovers any hazardous waste, hazardous substance, petroleum or other deleterious material, including but not limited to any non-containerized commodity or material, on or adjacent to Railway's Property, in or near any surface water, swamp, wetlands or waterways, while performing any work under this Agreement, Contractor must immediately: (a) notify the Railway's Resource Operations Center at 1(800) 832-5452, of such discovery: (b) take safeguards necessary to protect its employees, subcontractors, agents and/or third parties: and (c) exercise due care with respect to the release, including the taking of any appropriate measure to minimize the impact of such release.

1.8 Personal Injury Reporting

1.8.1 The Railway is required to report certain injuries as a part of compliance with Federal Railroad Administration (FRA) reporting requirements. Any personal injury sustained by an employee of the Contractor, subcontractor or Contractor's invitees while on the Railway's Property must be reported immediately (by phone mail if unable to contact in person) to the Railway's representative in charge of the project. The Non-Employee Personal Injury Data Collection Form contained herein is to be completed and sent by fax to the Railway at 1-(817) 352-7595 and to the Railway's Project Representative no later than the close of shift on the date of the injury.

NON-EMPLOYEE PERSONAL INJURY DATA COLLECTION

INFORMATION REQUIRED TO BE COLLECTED PURSUANT TO FEDERAL REGULATION. IT SHOULD BE USED FOR COMPLIANCE WITH FEDERAL REGULATIONS ONLY AND IS NOT INTENDED TO PRESUME ACCEPTANCE OF RESPONSIBILITY OR LIABILITY.

1. Accident City/St _____
County: _____
(if non-Railway location)
2. Date: _____ Time: _____
3. Temperature: _____
4. Weather _____
5. Social Security # _____
6. Name (last, first, mi) _____
7. Address: Street: _____ City: _____ St. _____ Zip: _____
8. Date of Birth: _____ and/or Age _____ Gender: _____
(if available)
9. (a) Injury: _____ (b) Body Part: _____
(i.e. (a) Laceration (b) Hand)
10. Description of Accident (To include location, action, result, etc.): _____

11. Treatment:
? First Aid Only
? Required Medical Treatment
? Other Medical Treatment
12. Dr. Name _____ 30. Date: _____
13. Dr. Address:
Street: _____ City: _____ St: _____ Zip: _____
14. Hospital Name: _____
15. Hospital Address:
Street: _____ City: _____ St: _____ Zip: _____
16. Diagnosis: _____

**FAX TO
RAILWAY AT (817) 352-7595
AND COPY TO
RAILWAY ROADMASTER FAX**

2. INSURANCE

The Contractor shall carry the following insurance coverage:

- A. **Commercial General Liability** insurance. This insurance shall contain broad form contractual liability with a single limit of **at least \$3,000,000** each occurrence or claim and an aggregate limit of **at least \$4,000,000**. Coverage must be purchased on a post 1998 ISO or equivalent form, including but not limited to coverage for the following:

- Bodily injury including death and personal injury.
- Property damage.
- Fire legal liability.
- Products and completed operations.

The policy shall also contain the following endorsements **which shall be indicated on the certificate of insurance**:

- The employee and workers compensation related exclusions in the above policy apply only to Contractor's employees.
- The exclusions for railroads (except where the Job Site is more than fifty feet (50') from any railroad including but not limited to tracks, bridges, trestles, roadbeds, terminals, underpasses or crossings), and explosion, collapse and underground hazard shall be removed.
- Waiver of subrogation.

- B. **Business Automobile Coverage** insurance. This insurance shall contain a combined single limit of **at least \$3,000,000** per occurrence or claim, including but not limited to coverage for the following:

- Bodily injury and property damage.
- Any and all motor vehicles including owned, hired and non-owned.

The policy shall also contain the following endorsements **which shall be indicated on the certificate of insurance**:

- The employee and workers compensation related exclusions in the above policy apply only to Contractor's employees.
- The exclusions for railroads (except where the Job Site is more than fifty feet (50') from any railroad including but not limited to tracks, bridges, trestles, roadbeds, terminals, underpasses or crossings), and explosion, collapse and underground hazard shall be removed.
- Motor Carrier Act Endorsement - Hazardous materials clean up (MCS-90) **if required by law.**

- C. **Workers Compensation and Employers Liability** insurance including but not limited to:

- Contractor's statutory liability under the workers' compensation laws of the state(s) affected by this Agreement.
- Employers' Liability (Part B) with limits of at least \$500,000 each accident, \$500,000 disease policy limit
- \$500,000 each employee

If Workers Compensation Insurance will not cover the liability of Contractor in states that require participation in State Workers' Compensation Fund, Contractor shall comply with the laws of such states. If Contractor is self-insured, evidence of State approval must be provided along with evidence of excess workers compensation coverage. Coverage shall include liability arising out of the U. S. Longshoremen's and Harbor Workers' Act, the Jones Act, and the Outer Continental Shelf Land Act, if applicable.

- D. **Umbrella or Excess Policies** in the event Contractor utilizes Umbrella or Excess Policies, these policies shall "follow form" and afford no less coverage than the primary policy.
- E. **Railroad Protective Liability** insurance naming only the Railway as the insured with a combined single limit of \$2,000,000 per occurrence with a \$6,000,000 aggregate. The policy shall be broad form coverage for "Physical Damage to Property" (ISO Form CG 00 35 07 98 or equivalent). A binder stating the policy is in place must be submitted to the Railroad until the original policy is forwarded to the Railroad.

Other Requirements

- F. Punitive damage exclusion must be **deleted, which deletion shall be indicated on the certificate of insurance.**
- G. Contractor agrees to waive its right of recovery, and its insurers, through policy endorsement, agree to waive their right of subrogation against Railway. Contractor further waives its right of recovery, and its insurers also waive their right of subrogation against Railway for loss of its owned or leased property or property under its care, custody and control. With the exception of the umbrella or excess policies, Contractor's insurance shall be primary with respect to any insurance carried by the Railroad, other than a Railway Protective Policy. All waivers of subrogation **shall be indicated on the certificate of insurance.**
- H. All policy(ies) required above (excluding Workers Compensation) shall provide severability of interests and shall name Railway as an additional insured. **Severability of interest and naming Railway as an additional insured shall be indicated on the certificate of insurance.**
- I. Prior to commencing the work, Contractor shall furnish to Railway original certificate(s) of insurance evidencing the required coverage, endorsements and amendments. The certificate(s) shall contain a provision that obligates the insurance company(ies) issuing such policy(ies) to notify Railway in writing of any cancellation or material alteration. **Upon request from Railway, a certified duplicate original of any required policy shall be furnished.**
- J. Any insurance policy shall be written by a reputable insurance company acceptable to Railroad or with a current Best's Insurance Guide Rating of A- and Class VII or better, and authorized to do business in the state(s) in which the service is to be provided.
- K. Contractor **WARRANTS** that this Agreement has been thoroughly reviewed by Contractor's insurance agent(s)/broker(s), who have been instructed by Contractor to procure the insurance coverage required by this Agreement and acknowledges, with the exception of the umbrella or excess policies, that Contractor's insurance shall be primary

with respect to any insurance carried by the Railroad, other than a Railroad Protective Policy.

- L.** If Contractor fails to procure and maintain insurance as required, Railway may elect to do so at the cost of Contractor plus 25% administration fee.
- M.** The fact that insurance is obtained by Contractor or Railway on behalf of Contractor shall not be deemed to release or diminish the liability of Contractor, including, without limitation, liability under the indemnity provisions of this Agreement. Damages recoverable by Railway shall not be limited by the amount of the required insurance coverage.

3. ADDITIONAL RIGHT OF WAY

3.1 The Department right-of-way plans show the permanent and temporary easements acquired, or to be acquired by the Department for this project. Any additional land or easements that the Contractor may desire for the construction of the project shall be provided by the Contractor at its own expense.

BNSF INDEMNITY PROVISION

The State agrees to insert the following provision in any contract in which State's Contractor will have access to The Railway property:

To the extent allowed by law, Contractor hereby releases and shall indemnify, defend and hold harmless The Railway, its affiliated companies, partners, successors, assigns, legal representatives, officers, directors, shareholders, employees and agents for, from and against any and all claims, liabilities, fines, penalties, costs, damages, losses, liens, causes of action, suits, demands, judgments and expenses (including, without limitation, court costs and reasonable attorneys' fees) of any nature, kind or description of any person (including, without limitation, the employees of the parties hereto and the employees of The Railway) or entity directly or indirectly arising out of, resulting from, or related to (in whole or in part) (i) the use, occupancy or presence of State, its Contractors, subcontractors, employees or agents, in, on, or about the construction site; (ii) the performance or failure to perform by the Contractor, its subcontractors, employees, or agents, its work or any obligation under this Agreement; or (iii) the sole or contributing acts or omissions of Contractor, its subcontractors, employees, or agents, in, on, or about the construction site. Contractor further agrees to appear and defend in the name of The Railway, any suits or actions brought against The Railway, on account of any personal injury or death, and loss or damage to or destruction of Property, and to pay and satisfy any final judgment that may be rendered against The Railway and any such suit or action, to the extent such suits, actions, or judgments were not solely caused by, or arising out of, the acts or omissions of Railway, its employees, agents, servants, successors or assigns. THE LIABILITY ASSUMED BY CONTRACTOR WILL NOT BE AFFECTED BY THE FACT, IF IT IS A FACT, THAT THE DAMAGE, DESTRUCTION, INJURY OR DEATH WAS OCCASIONED BY OR CONTRIBUTED TO BY THE NEGLIGENCE OF THE RAILWAY, ITS AGENTS, SERVANTS, EMPLOYEES, OR OTHERWISE, EXCEPT (I) TO THE EXTENT THAT SUCH CLAIMS ARE PROXIMATELY CAUSED BY THE ACTIVE GROSS NEGLIGENCE OR INTENTIONAL MISCONDUCT OF THE RAILWAY, OR (II) FOR CLAIMS ARISING SOLELY OUT OF THE NEGLIGENT ACTIONS OF THE RAILWAY EMPLOYEES, SERVANTS OR AGENTS.

PERCENTAGE OF COST OF WORK WITHIN RAILROAD RIGHT-OF-WAY

The following information is furnished to aid in the determination of a proper premium for the Railroad Protective Liability Insurance required elsewhere in these special provisions.

RAILROAD PROTECTIVE POLICY DATA SHEET

Railroad: BNSF Railway Company

Railroad Contact: Bentley Tomlin

Title: Manager Public Projects

Address: 4545 Kansas Avenue
Kansas City, KS 66106

Telephone Number: (913) 551-4964

Project Number: STR-275-7(1045)

Project Location: South Omaha Veterans Memorial Bridge

Type of Project: System Preservation

No. of trains/day: Total: 2

Freight or Coal: 0 Speed: N/A mph Passenger: 2 Speed: 60 mph

No. of Tracks: Mainline: 2 Branchline: 0

Project Over RR: No Yes Project Under Railroad: No Yes

Railroad Shoo-fly Required: No Yes

Project Parallel to RR: No Yes If Yes, Number of Miles: N/A

Crossings on State Highway or City Street System: No Yes

If Yes, Number of Crossings: 1 @ DOT #074670W, RRMP 13.520

Pavement or Overlay up to Crossing on County or City Road: No Yes

If Yes, Number of Crossings: N/A

Work to be done by Railroad: Flagging

It shall be the Contractor's responsibility to contact the railroad for additional information needed to purchase the Railroad Protective Policy.

The percentage of work within railroad right of way that is within 50 feet (15.25 meters) of any railroad track shall be covered by Railroad Protective Insurance. The railroad's ownership of right of way that extends beyond 50 feet (15.25 meters) from the closest track shall be covered under regular Contractor's Public Liability and Property Damage Insurance in the amounts specified in this contract.

<u>Group</u>	<u>Approximate Percent of Work Within 50 feet (15.25 meters) of Nearest Track</u>	<u>Approximate Percent of Work on RR/ROW Not Within 50 feet (15.25 meters) of Nearest Track</u>	<u>Description of Work</u>
<u>All</u>	<u>2.5%</u>	<u>---</u> %	<u>---</u>

**LIABILITY INSURANCE
(A-55-0414)**

Subsection 107.13 in the Standard Specifications is void and superseded by the following:

107.13 – Liability Insurance

Prior to execution of the contract, the Contractor shall obtain insurance coverage to fully protect it from loss associated with the work, and have at a minimum the insurance described below:

1. General Liability:
Limits of at least:
 - \$ 1,000,000 per Occurrence
 - \$ 2,000,000 General Aggregate
 - \$ 2,000,000 Completed Operations Aggregate
 - \$ 1,000,000 Personal and Advertising Injury
 - a. Contractor shall be responsible for the payment of any deductibles.
 - b. Coverage shall be provided by a standard form Commercial General Liability Policy (CG0001 or equivalent) covering bodily injury, property damage including loss of use, and personal injury.
 - c. The General Aggregate shall apply on a Per Project Basis.
 - d. The State of Nebraska, Department of Roads, shall be named as an Additional Insured on a primary and non-contributory basis including completed operations for three (3) years after final acceptance and payment.
 - e. Contractor agrees to waive its rights of recovery against the State of Nebraska, Department of Roads. Waiver of Subrogation in favor of the State of Nebraska, Department of Roads shall be added to the policy.
 - f. Contractual liability coverage shall be on a broad form basis and shall not be amended by any limiting endorsements.
 - g. If work is being performed near a railroad track, the 50' railroad right-of-way exclusion must be deleted.

- h. Products and completed operations coverage in the amount provided above shall be maintained for the duration of the work, and shall be further maintained for a minimum period of three years after final acceptance and payment.
 - i. Coverage shall be included for demolition of any building or structure, collapse, explosion, blasting, excavation and damage to property below surface of ground (XCU coverage).
 - j. Policy shall not contain a total or absolute pollution exclusion. Coverage shall be provided for pollution exposures arising from products and completed operations as per standard CG0001 Pollution Exclusion or equivalent. If the standard pollution exclusion as provided by CG0001 has been amended, coverage must be substituted with a separate Pollution Liability policy of \$1.0 million per occurrence and \$2.0 million aggregate. If coverage is provided by a "claims made" form, coverage will be maintained for three years after project completion. Any applicable deductible is the responsibility of the Contractor.
2. Automobile Liability:
Limits of at least:
\$ 1,000,000 CSL per Accident
- a. Coverage shall apply to all Owned, Hired, and Non-Owned Autos.
 - b. If work is being performed near a railroad track, the 50-foot railroad right-of-way exclusion must be deleted.
 - c. Contractor agrees to waive its rights of recovery against the State of Nebraska, Department of Roads. Waiver of Subrogation in favor of the State of Nebraska, Department of Roads, shall be added to the policy.
 - d. Automobile liability coverage shall be obtained from an insurance carrier who is licensed with the Nebraska Department of Insurance.
3. Workers' Compensation:
Limit: Statutory coverage for the State where the project is located.
Employer's Liability limits: \$500,000 Each Accident
\$500,000 Disease – Per Person
\$500,000 Disease – Policy Limit
- a. Contractor agrees to waive its rights of recovery against the State of Nebraska, Department of Roads. Waiver of Subrogation in favor of the State of Nebraska, Department of Roads shall be added to the policy.
 - b. Workers' compensation coverage shall be obtained from an insurance carrier who is licensed with the Nebraska Department of Insurance.
 - c. Where applicable, the Longshore and Harborworkers Compensation Act endorsement shall be attached to the policy.
4. Umbrella/Excess:
Limits of at least:
\$1,000,000 per Occurrence
- a. Policy shall provide liability coverage in excess of the specified Employers Liability, Commercial General Liability and Automobile Liability.

- b. The State of Nebraska, Department of Roads, shall be an “Additional Insured.”
 - c. Contractor agrees to waive its rights of recovery against the State of Nebraska, Department of Roads. Waiver of subrogation in favor of the State of Nebraska, Department of Roads shall be provided.
5. Pollution Liability:
- a. When “hazardous wastes” or contaminated or polluted materials must be handled and/or moved, the Contractor shall obtain Pollution Liability Coverage with minimum limits of \$1,000,000 per occurrence and \$2,000,000 aggregate.
 - b. If, during the course of construction, hazardous wastes, contaminated or polluted material are discovered on the project, the Contractor shall immediately cease any operation that may disturb these materials, and shall immediately notify the Engineer of all facts related to the discovery of these materials.
 - c. Unforeseen work related to the discovery of hazardous, contaminated or polluted materials on the project, and the extra cost, if any, of pollution liability coverage will be handled as “extra work.”
6. Additional Requirements:
- a. The Contractor shall provide and carry any additional insurance required by the Special Provisions.
 - b. Except as otherwise provided herein, all insurance shall be kept in full force and effect until after the State releases the Contractor from all obligations under the contract.
 - c.
 - (1) If any of the work is sublet, equivalent insurance shall be provided by or on behalf of the subcontractor or subcontractors (at any tier) to cover all operations.
 - (2) Approved trucking subcontractors (at any tier) who are being utilized only for the purpose of hauling materials shall be exempt from the requirements of Paragraphs 1, 4, and 5.
 - (3)
 - (i) When a Contractor or subcontractor chooses to employ a trucker by carrying the driver on his or her payroll and entering into a lease agreement for the truck, the owner-operator of the truck shall be required to comply with the Automobile Liability provisions of Paragraph 2.
 - (ii) Furthermore, it shall be the duty of the Prime Contractor to ensure that the owner-operator of the truck has such insurance in effect. The Prime Contractor shall maintain evidence that any truckers so utilized (at any tier) are insured to the minimum limits specified and be able to furnish documentation of the same on demand.
 - (iii) Failure to ensure that insurance coverage exists and failure to maintain evidence thereof shall be considered a breach of the contract.
 - d. Any insurance policy shall be written by an insurance company with a Best’s Insurance Guide Rating of A – VII or better.

- e. Prior to execution of the contract, Contractor shall provide the State of Nebraska, Department of Roads, evidence of such insurance coverage in effect in the form of an Accord (or equivalent) certificate of insurance executed by a licensed representative of the participating insurer(s). Certificates of insurance shall show the Nebraska Department of Roads as the certificate holders.
- f. For so long as insurance coverage is required under this agreement, the Contractor shall have a duty to notify the Department when the Contractor knows, or has reason to believe, that any insurance coverage required under this agreement will lapse, or may be cancelled or terminated. The Contractor must forward any pertinent notice of cancellation or termination to the Department at the address listed below by mail (return receipt requested), hand-delivery, or facsimile transmission within 2 business days of receipt by Contractor of any such notice from an insurance carrier. Notice shall be sent to:
 - Nebraska Department of Roads
 - Construction Division --- Insurance Section
 - 1500 Highway 2, P.O. Box 94759
 - Lincoln, NE 68509-4759
 - Facsimile No. 402-479-4854
- g. Failure of the owner or any other party to review, approve, and/or reject a certificate of insurance in whole or in part does not waive the requirements of this agreement.
- h. The limits of coverage set forth in this document are suggested minimum limits of coverage. The suggested limits of coverage shall not be construed to be a limitation of the liability on the part of the Contractor or any of its subcontractors/tier subcontractors. The carrying of insurance described shall in no way be interpreted as relieving the Contractor, subcontractor, or tier subcontractors of any responsibility or liability under the contract.
- i. If there is a discrepancy of coverage between this document and any other insurance specification for this project, the greater limit or coverage requirement shall prevail.

CONSTRUCTION DETAILS

TEMPORARY WATER POLLUTION CONTROL (B-3-1014)

Section 204 in the Standard Specifications is void.

CONSTRUCTION STORMWATER MANAGEMENT CONTROL (B-3-1014)

A. General

1. This Section defines some best management practices (BMPs) for erosion and sediment control measures and construction practices the Contractor shall use to prevent soil erosion and avoid water pollution.
2.
 - a. The Department and the Contractor are co-permittees of the NPDES Construction Storm Water General Permit.
 - b. The Contractor shall comply with all conditions required by the current NPDES Construction Storm Water General Permit.
3. The Contractor shall exercise every reasonable precaution throughout the life of the contract to prevent silting of the waters of the state, the project site, and adjacent property. Construction of drainage facilities, as well as performance of other contract work which will contribute to the control of siltation, shall be carried out in conjunction with earthwork operations or as soon thereafter as is practicable.
4.
 - a. The Contractor shall take sufficient precautions to prevent pollution of the waters of the state, the project site, and adjacent property from construction debris, petroleum products, chemicals, or other harmful materials.

The Contractor shall conduct and schedule the operations to avoid interference with any protected species.
 - b. The Contractor shall comply with all applicable statutes relating to pollution of the waters of the state and fish and game regulations.
5. All construction debris shall be disposed in a manner that it cannot enter any waterway. Excavation shall be deposited as to protect the waters of the state from siltation.
6. All erosion and sediment control measures shall be properly installed and maintained by the Contractor until all permanent drainage facilities have been constructed, and all slopes are sufficiently vegetated to be an effective erosion deterrent; or until tentative acceptance of the work.
7. All erosion and sedimentation resulting from the Contractor's operations and the weather conditions must be corrected by the Contractor.

**LIMITATION OF OPERATIONS
(B-3-1014)**

A. General

1. The maximum exposed surface area for the Contractor's operations in excavation, borrow, and embankment is 18 acres (72,800 m²) plus an equal area of clearing and grubbing/large tree removal. A written request for an increase in the maximum exposed surface area may be approved by the Engineer. This approval will be based on the soil, moisture, seasonal conditions, the Contractor's operation, or other conditions.
2. The Engineer shall have the authority to reduce the maximum exposed surface area when any of the following conditions warrant:
 - a. Soil and moisture conditions are such that erosion is probable.
 - b. Seasonal conditions may force extended delays.
 - c. Proximity to the waters of the state requires more stringent controls.
 - d. Equipment and personnel available on the job is not sufficient to properly maintain erosion and dust control measures.
 - e. Any other environmental condition in the area that may exist which would be affected by erosion from the project.
3. Construction operations in rivers, streams, wetlands, and impoundments shall be restricted to those areas specifically shown in the contract. Rivers, streams, wetlands, and impoundments shall be promptly cleared of all false work, piling, debris, or other obstructions placed therein or caused by the construction operations.
4. Fording and operation of construction equipment within streams and wetlands will not be allowed, unless explicitly allowed in the contract. Streams are defined as any area between the high banks, regardless of the flow conditions.

**CONSTRUCTION METHODS
(B-3-1014)**

A. General

1. The Contractor shall conduct all construction activities and install temporary erosion control measures, as necessary, to control sediment and avoid soil erosion during construction.
2. The Contractor shall incorporate all permanent erosion control features into the project at the earliest practicable time.
3. Construction stormwater management control measures for Contractor obtained work areas located outside the right-of-way, such as borrow site operations, haul

roads, plant sites, staging sites, waste sites, equipment storage sites, etc. are the sole responsibility of the Contractor. All construction stormwater management control measures for these areas are at the Contractor's expense. The Contractor is responsible for securing all required permits for use of these sites.

4. The construction stormwater management procedures contained herein shall be coordinated with any permanent erosion control measures specified elsewhere in the contract to the extent practical to assure economical, effective, and continuous erosion and sediment control throughout the construction period.
5. The Contractor shall be responsible to limit erosion and prevent siltation into the waters of the state during the construction period, as well as during the times that work may be suspended.
6.
 - a. All erosion and sediment control items shall be installed by personnel who are knowledgeable in the principles and practice of various BMP installations.
 - b. The installation of all erosion and sediment control items shall be done under the direct supervision of the Contractor's employee who has successfully completed training provided by the Department and has been certified as an Erosion and Sediment Control Inspector (Inspector). The Contractor's Inspector shall be present at each site during installation to direct and inspect all erosion and sediment control BMP installations.
 - i. The NDOR Erosion and Sediment Control Inspector Certification is obtained by completing an Erosion and Sediment Control Inspector Training Course provided by the Nebraska Department of Roads and passing the examination that accompanies the training.
 - c. The Contractor shall notify the Engineer of all employees, who have been certified as Inspectors, who will be on the project to direct and inspect all erosion and sediment control BMP installations.
 - d. No payment will be made for any erosion and sediment control item unless a Contractor's Inspector was present to directly supervise and inspect the work.
 - e. No payment will be made for any erosion and sediment control item that is not properly installed. All erosion and sediment control items shall be installed as per the contract.

**ENVIRONMENTAL COMMITMENT DOCUMENT
(B-3-1014)**

A. Environmental Commitment Document

1. a. An Environmental Commitment Document will be created by the Department to identify all project specific environmental commitments and will be included in the Contract.
- b. The Department will provide information for the following, when applicable:
 - i. Storm Water Pollution Prevention Plan (SWPPP)
 - ii. U.S. Army Corps of Engineers (USACE) Section 404 Permit
 - iii. Nebraska Department of Environmental Quality 401 Water Quality Certification
 - iv. State Title 117 Waters (USACE Non-Jurisdictional)
 - v. Floodplain Permit
 - vi. Historic Clearance
 - vii. Endangered Species Act Clearance
 - viii. Nebraska Nongame and Endangered Species Conservation Act Clearance
 - ix. National Environmental Policy Act Compliance
 - x. NPDES Construction Stormwater Permit (within Right-of-Way limits, only)
 - xi. Conservation Measures
 - xii. Migratory Bird Treaty Act
 - xiii. Bald and Golden Eagle Protection Act Compliance
 - xiv. Other pertinent issues
- c. The Contractor shall provide information for the following, when applicable:
 - i. Temporary Erosion Control Plan
 - ii. Spill Prevention and Control Plan
 - iii. Migratory Bird Treaty Act Compliance Plan
 - iv. Name and telephone number of the Contractor's representative responsible for the Environmental Commitments
 - v. Name and telephone number of the employees that are NDOR-Certified Erosion and Sediment Control Inspectors
 - vi. Critical Path Construction Schedule
 - vii. Other items as defined elsewhere in the contract

**STORM WATER POLLUTION PREVENTION PLAN (SWPPP)
(B-3-1014)**

A. General

1. A SWPPP is required for projects that construction activities will cause a land disturbance of one (1) acre or more. The Department will prepare the SWPPP for the areas within the Right-of-Way, temporary easements and permanent easements.
2. For projects not requiring a SWPPP, the Contractor shall comply with the requirements of Environmental Commitment Document, Paragraph 1.b. of this Special Provision, as applicable.
3. Contractor obtained work areas, located on private property, are not included in the NDOR Project SWPPP.

B. Temporary Erosion Control Plan

1. The Contractor shall prepare and submit the Temporary Erosion Control Plan prior to the start of any work. The Contractor shall not begin work until the Temporary Erosion Control Plan has been submitted to the Engineer and appropriate erosion control measures are in place. Payment for any work on the contract will be withheld if erosion control measures are not in place or properly maintained.
2. The Temporary Erosion Control Plan will be reviewed at project progress meetings. All active Contractors shall have their Inspectors present and work in cooperation to determine any necessary changes. Necessary changes will be documented on the Temporary Erosion Control Plan by the Engineer.
3. Payment for preparing the Temporary Erosion Control Plan, inspections and meeting reviews are subsidiary to items that direct payment is made.

C. Spill Prevention and Control Plan

1. All project activities shall be addressed in the Spill Prevention and Control Plan. The Contractor shall prepare and submit the plan to the Engineer and install all appropriate spill prevention and control measures prior to the start of any work.
2. The Spill Prevention and Control Plan shall clearly state measures to prevent, contain, document and clean up a spill. It shall state measures for disposal of the contaminated material, disposal documentation and incident review to train personnel to prevent spills from reoccurring.
3. Spill Prevention and Control Plans are applicable to construction sites where hazardous materials are stored, used and/or generated onsite. Hazardous materials include, but not limited to: hazardous wastes, pesticides, paints, cleaners, petroleum products, fertilizers, solvents and porta-potty wastes.
4. Direct payment will not be made for the Spill Prevention and Control Plan.

D. Migratory Bird Treaty Act Compliance Plan

1. The Contractor shall not begin work until a Migratory Bird Treaty Act Compliance Plan has been submitted to the Engineer and appropriate nesting migratory bird avoidance measures are in place.
2. a. The Contractor shall clearly state the necessary measures they intend to use to avoid a “Take” of nesting migratory birds in the Migratory Bird Treaty Act Compliance Plan. Measures may include but are not limited to:
 - i. Clearing and grubbing prior to April 1st or after September 1st
 - ii. Tree removal prior to April 1st or after September 1st
 - iii. Clearing empty nests on structures prior to April 1st
 - iv. Maintaining clear structures until commencement and throughout the duration of work on structures
 - v. Netting structures to prevent nesting
 - vi. Commitment to perform surveys according to protocol
 - vii. Hire a biologist to survey areas to be disturbed prior to commencement of work during the nesting season
 - viii. Submittal of required bird survey reports
 - ix. Training of Contractor Personnel to insure compliance
3. a. The Migratory Bird Treaty Act Compliance Plan is applicable to the entire project site to avoid the “Take” of migratory birds protected under the Migratory Bird Treaty Act.

b. “Take” is defined as: pursuit, hunt, shoot, wound, kill, trap, capture, collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect.
4. The Migratory Bird Treaty Act Compliance Plan shall adhere to the NDOR’s Avian Protection Plan located at:

<http://www.transportation.nebraska.gov/environment/guides/avian-protection-plan.pdf>

Direct payment will not be made for the Migratory Bird Treaty Act Compliance Plan.

E. SWPPP Inspection

1. The Contractor shall accompany the Engineer on inspections in accordance with the NPDES Construction Storm Water General Permit.
2. The SWPPP will be maintained and updated by the Engineer as work progresses and site conditions change to accurately describe the BMPs that are currently in place.

3. The Contractor's participation in SWPPP inspections, maintenance and updates shall begin on the first day construction activities cause land disturbance and end on the date of project completion as evidenced as the completion date in the District Engineer's Letter of Tentative Acceptance.
4.
 - a. The Contractor's Inspector shall be responsible for ensuring that all BMPs are installed in accordance with the contract or the manufacturers' recommendations. The Contractor's Inspector shall be capable of reading and interpreting these documents.
 - b. The Contractor's Inspector shall be familiar with product and structural BMPs. The Contractor's Inspector shall inspect, assess, and supervise the maintenance of erosion and sediment control BMPs to ensure compliance with the NPDES Construction Storm Water General Permit while preserving BMP functionality.
5. Payment for project inspection is subsidiary to items that direct payment is made.

ENVIRONMENTAL COMMITMENT ENFORCEMENT (B-3-1215)

A. General

1. This specification establishes payment and disincentive assessment for the Contractor's performance in complying with Contract Environmental Commitments.
2. Deficiencies are described but not limited to:
 - a. Failure to install pollution prevention control BMPs as work progresses or as described in the SWPPP.
 - b. Failure to maintain existing pollution prevention control BMPs.
 - c. Failure to remove non-functioning pollution prevention control BMPs.
 - d. Failure to comply with USACE Section 404 Permit requirements.
 - e. Failure to comply with NPDES Construction Storm Water General Permit requirements.
 - f. Failure to comply with all applicable statutes relating to pollution of the waters of the state.
 - g. Exceeding the maximum exposed surface area for excavation of 18 Acres without written request for permission and written approval.
 - h. Failure to comply with wildlife species specific conservation conditions.
 - i. Failure to comply with the Contract.
 - j. Failure to comply with the Engineers directives.

B. SWPPP Deficiency Notification

1. The Engineer will document and direct the Contractor to correct deficiencies.
2.
 - a. The Contractor shall commence correcting deficiencies, provide adequate equipment and personnel, and diligently pursue correcting deficiencies without cessation until all deficiencies have been corrected.
 - b. The count of Working Days and/or Calendar Days will continue during the time period that corrective work is being performed.
 - c. Delays to the project as a result of the Contractor conducting corrective actions for the Contract Environmental Commitments will not constitute a valid reason for an extension of the contract time allowance.
3. Deficiencies shall be corrected within seven (7) calendar days of notification or within an approved extension. When deficiencies are not corrected within seven (7) calendar days or within an approved extension, the Engineer will make a disincentive assessment to the contract as stated herein.
4.
 - a. If soil, weather, or other conditions prevent the Contractor from completing the corrective actions within seven (7) calendar days, the Contractor shall notify the Engineer in writing. The Contractor's letter shall state the reasons preventing corrective action within the time allowed. The Contractor shall propose a written Corrective Action Plan within 48 hours. Corrective work shall continue while the Corrective Action Plan is developed. The Contractor's Corrective Action Plan must contain a course of action and a time frame for completion. If the reasons and the Corrective Action Plan are acceptable, the Engineer may extend the time in which to complete the corrective work.
 - b. The Contractor will be allowed to proceed with the plan as proposed without incurring a disincentive assessment. If all corrective work is completed within the time allowance shown in the Notification or within an approved extension, a disincentive assessment will not be imposed upon the Contractor.
 - c. Storm events or soil and weather conditions occurring on other projects, which interfere with a Contractor completing corrective actions on the project within seven (7) calendar days, will not be justification for a time extension to complete the corrective work.
5. If all corrective work identified in the Notification has not been completed at the end of the seventh (7th) calendar day after the Initial Notice Date or within an approved extension, a Shut-Down Notice will be issued on the eighth (8th) calendar day after the Initial Notice Date or on the calendar day following the last day of an approved extension.
6. All operations shall cease as of the date and time cited in the Shut-Down Notice. The Contractor shall work, exclusively, on the deficiencies until all have been corrected or as directed by the Engineer. Upon issuance of the Shut-Down

Notice, a disincentive of \$500.00 per deficiency per calendar day will be assessed thru the day the corrective work is completed, inclusive.

7. The Engineer may require the Contractor to provide a written Procedures Plan that describes the process to prevent reoccurrence of deficiencies. The written Procedures Plan shall be provided within two (2) calendar days of the request. Failure to correct all deficiencies and provide a Procedures Plan may result in payments being withheld until such time that procedures are outlined.
 - a. Payment for preparing a written Procedures Plan is subsidiary to items that direct payment is made.

C. Storm Event Restoration – Incentive and Disincentive

1. The Department will pay “Storm Event Restoration - Incentive” when the Contractor completes the restoration work to eliminate the pollution prevention control deficiencies within seven (7) calendar days of Notification or within an approved extension. Multiple deficiencies may be included in one notification. If the restoration work has not been completed within seven (7) calendar days after the Initial Notice or within an approved extension, payment for the item of “Storm Event Restoration - Incentive” will not be made.
2. A storm event is defined as a storm exceeding 0.50 inch of rain in a 24 hour period.
3. The Department will notify the Contractor of pollution prevention control deficiencies.
4.
 - a. Payment for the item of “Storm Event Restoration - Incentive” may not be made when the Contractor is notified to correct pollution prevention devices not installed in accordance with the contract or the manufacturer’s recommended installation instructions.
5. If the restoration work is not completed within seven (7) calendar days or within an approved extension, a disincentive assessment of \$500.00 per deficiency per calendar day will be assessed. The disincentive assessment will begin on the eighth (8th) calendar day after the issuance of the Initial Notice Date or on the calendar day following the last day of an approved extension(s) and continue through the day that the restoration work is completed, inclusive.

D. Method of Measurement

1.
 - a. “Storm Event Restoration – Incentive” will be measured by the each upon completion of restoration of all deficiencies included in a notification within the allowed time and only one payment per notification is allowed when multiple deficiencies are included on the notification.
 - b. If deficiencies from multiple notifications are restored during the same restoration operation, only one (1) incentive is eligible for payment.

- c. If multiple notifications are the result of successive storm events and deficiencies are transferred to ensuing notifications, incentive payment is only eligible for the latest notification.
- 2. "Storm Event Restoration – Disincentive" will be measured by the calendar day in accordance with Paragraph C.5. above.

E. Basis of Payment

- | | | |
|----|--|---|
| 1. | Pay Item
Storm Event Restoration – Incentive
Storm Event Restoration – Disincentive | Pay Unit
Each
Calendar Day |
|----|--|---|
- 2. All equipment, materials, etc. used in the restoration work will be paid for in accordance with Division 800 of the Standard Specifications.
 - 3. Payment is full compensation for all other incidentals required to complete the restoration work included in the notification within the allowed time.

F. Environmental Commitments – Contractor Compliance

- 1. To provide payment for all plans, inspections, surveys, reports, travel, qualified inspection person's, carrion removal, and any other subsidiary activities for the work of implementing threatened and endangered species commitments, temporary erosion control or any other environmental commitments prescribed in the contract.
- 2. Multiple visits to the project may be required to comply with environmental commitments prescribed in the contract.

G. Method of Measurement

- 1. No measurement is required.

H. Basis of Payment

- | | | |
|----|--|-----------------------------|
| 1. | Pay Item
Environmental Commitments – Contractor Compliance | Pay Unit
Lump Sum |
|----|--|-----------------------------|
- 2. Partial payments will be made as follows:
 - a. The Department will pay 50 percent of the total amount bid for the item Environmental Commitments – Contractor Compliance within seven (7) calendar days after the Notice to Proceed Date.
 - b. Upon completion of 50 percent of the Original Contract Amount, the Department will pay 30 percent of the amount bid for the item Environmental Commitments – Contractor Compliance.
 - c. Upon completion of 75 percent of the Original Contract Amount, the Department will pay the remaining 20 percent of the amount bid for the item Environmental Commitments – Contractor Compliance.

- d. Failure to comply with any or all of the contract requirements, included for payment under the item of Environmental Commitments – Contractor Compliance, will preclude all payment for the item, including any previous payment.
3. Payment is full compensation for all work prescribed in the contract.

I. Immediate Action Deficiencies

1. Deficiencies that pose an imminent threat to the environment are considered an emergency situation. These deficiencies will be identified in the Immediate Action Deficiencies Section of the Environmental Commitment Deficiency Notification Form. The corrective work for Immediate Action Deficiencies shall begin immediately and continue without cessation until completed.
2. The Engineer will issue a shut-down notice. All work on the contract shall cease until the corrective work has been completed. The Engineer may allow the Contractor to continue working in areas unaffected by the Immediate Action Deficiency, provided corrective actions are being actively performed on the deficiency.
3. Immediate Action Deficiencies are not eligible for an incentive payment.
4. The Contractor will be assessed a disincentive assessment of \$1,000.00 per deficiency per calendar day for failure to begin corrective actions or failing to continue to completion as directed by the Engineer or by the regulatory agency with jurisdiction.
5. Examples of Immediate Action Deficiencies include but are not limited to:
 - a. Threatened & Endangered Species habitat protection deficiencies
 - b. USACE Section 404 Permit Noncompliance
 - c. Petroleum Spills/Tank Leakage
 - d. Hazardous Material Spills

J. Rights Reserved

1. The Department reserves the right to initiate and perform corrective action on any deficiencies which result from the Contractors' actions, inactions, or for failure to comply with the NPDES Construction Stormwater General Permit, USACE Section 404 Permit, or any other applicable permit.
2. The Contractor shall be liable to the Department for any and all costs incurred by the Department for corrective actions taken by the Department.
3. It is expressly understood that the provisions of this specification shall not relieve the Contractor of their responsibilities nor shall it relieve the Surety of its obligation for and concerning any just claim.

4. The Contractor shall indemnify and save harmless the Department and all of its representatives from any and all actions or claims brought because of the Contractor's actions, inactions, or for failure to comply with the NPDES Construction Storm Water General Permit, USACE Section 404 Permit, or any other applicable permit.

**TYPE B HIGH INTENSITY WARNING LIGHTS
(D-6-0307)**

All references in the plans to Type B High Intensity Warning Lights shall be considered void. The plans will not be revised to reflect this change.

**TEMPORARY TRAFFIC CONTROL DEVICES
(Type II Barricades, Reflectorized Drums, 42" (1070 mm) Reflective Cones, and
Vertical Panels)
(D-6-1112)**

Paragraph 2.d. of Subsection 422.03 in the Standard Specifications is void and superseded by the following:

- d. (1) Reflectorized drums used for traffic warning or channelization shall be constructed of lightweight, flexible, and deformable materials, be a minimum of 36 inches (900 mm) in height, and have a minimum width of 18 inches (450 mm), regardless of orientation. The predominant color of the drum shall be orange.
- (2) Steel drums shall not be used.
- (3) The markings on drums shall be horizontal, shall be circumferential, and shall display four 6-inch (150 mm) wide bands of retroreflective sheeting, alternating fluorescent orange - white – fluorescent orange - white. The fluorescent orange sheeting shall meet the luminance requirements of the following table.

FHWA Luminance Factor

Sheeting Type	Luminance Factor Y_T		
	Min	Max	Fluorescence Luminance Factor Limit, Y_F
Fluorescent Orange	25	None	15

- e. When approved by the Engineer or shown in the plans, 42" (1070 mm) reflective cones may be used in lieu of Type II Barricades or Reflectorized Drums. 42" (1070 mm) reflective cones shall include a 30-pound (14 kg) rubber base and display four 6-inch (150 mm) wide bands of retroreflective sheeting, alternating fluorescent orange - white - fluorescent orange - white. 42" (1070 mm) reflective cones shall not be used for lane-closure tapers or shifts.
- f. Rubber base-mounted 36-inch vertical panels shall not be used for channelization when the speed limit exceeds 40 miles per hour.

Paragraph 2.b. of Subsection 422.04 of the Standard Specifications is void and superseded by the following:

- b. (i) Type II Barricades, Reflectorized Drums, and 42" (1070 mm) Reflective Cones shall be counted as "Barricades, Type II" and measured for payment by the number of calendar days each is in place and positioned as shown in the plans or as directed by the Engineer.
- (ii) Vertical Panels shall be measured for payment as permanent "Sign Days" (by the each) by the number of calendar days each vertical panel unit is in place and positioned as shown in the plans or as directed by the Engineer.

Paragraph 2.c. of Subsection 422.04 of the Standard Specifications is amended to include Reflectorized Drums.

Paragraphs 3. and 4. of Subsection 422.05 of the Standard Specifications are void and superseded by the following:

- 3. a. The pay item "Barricade, Type II" is used to pay for three items ("Barricades, Type II", "42" (1070 mm) Reflectorized Cones", and "Reflectorized Drums").
- b. "Barricades, Type II", which includes "42" (1070 mm) Reflectorized Cones", and "Reflectorized Drums", is paid for as an "established" contract unit price item. The established unit price is identified on the "Schedule of Items" shown in the Proposal.
- 4. Payment for vertical panels includes all posts, brackets, or hardware necessary to install and maintain the vertical panel units.

WORK ZONE TRAFFIC CONTROL SIGNS (D-6-1212)

The Department has adopted the FHWA 2009 Manual of Uniform Traffic Control (MUTCD) and the 2011 Nebraska Supplement to the MUTCD as the official guidance for work zone traffic control signs. Many work zone traffic control signs have been revised, redesigned, or replaced in the 2009 MUTCD (and 2011 Nebraska Supplement). Accordingly, all work zone signs shall comply with the following:

- 1 - All signs, regardless of age, shall meet the design standards of the 2009 MUTCD (and 2011 Nebraska Supplement).

**TEMPORARY PAVEMENT MARKING
(D-10-0811)**

Paragraph 4.f. of Subsection 422.01 in the Standard Specifications is void.

Paragraph 6.a.(2) of Subsection 422.03 is void and superseded by the following:

- (2) When the markings are no longer needed, the Contractor shall remove them. If removing markings from the final wearing surface, the removal process shall not mar or damage the surface. Removed markings shall no longer be visible on the final wearing surface.

Paragraph 6. of Subsection 422.03 in the Standard Specifications is amended to include the following:

This work shall consist of installing and removing reflectorized temporary pavement lines of the color, width and line configuration shown in the plans or as designated by the Engineer.

Temporary paint markings will be used on this project. The use of Type I tape will not be permitted and Type II tape may be used for short durations only, as directed by the Engineer. Temporary paint stripes shall be a minimum 4" (100 mm) wide, 10' (3 m) long with a 30-foot (9 m) gap or a minimum 4" (100 mm) wide solid line as shown on the plans.

Temporary pavement marking which is no longer applicable shall be removed as directed by the Engineer.

Paragraph 12.a. of Subsection 422.04 is void and superseded by the following:

- a. "Pavement Marking Removal" and "Temporary Pavement Marking Removal" shall be measured by the linear foot (meter) along the centerline of the traveled roadway for each line removed.

Subsection 422.04 is amended to include the following:

21. The use of paint for Temporary Pavement Marking shall be measured per linear foot (meter) for the item "Temporary Pavement Marking, Type Paint".
22. Temporary pavement marking tape Type II shall be measured per linear foot (meter) for the item "Temporary Pavement Marking, Type II".
23. Initial surface preparation requiring sand or shot blasting shall be measured per linear foot (meter) for the item "Temporary Pavement Marking, Surface Preparation". Surface preparation for repainting, consisting of air blasting and brushing, shall be subsidiary to other items for which payment is made.

Paragraph 1. of Subsection 422.05 is amended to include the following:

Pay Item	Pay Unit
Temporary Pavement Marking Removal	Linear Foot (LF)
Temporary Pavement Marking, Type Paint	Linear Foot (LF)
Temporary Pavement Marking, Type II	Linear Foot (LF)
Temporary Pavement Marking, Surface Preparation	Linear Foot (LF)

Paragraph 9.c. of Subsection 422.05 is void.

Paragraph 13. of Subsection 422.05 is void and superseded by the following:

13. Removal of temporary pavement markings including overlay broken/solid lines will be paid for except:
 - a. When the temporary markings are intended to be covered up by permanent markings.
 - b. When surface preparation removes the temporary markings.

Section 1069 in the Standard Specifications is amended to include the following:

1. Prior to the initial placement of the markings, temporary paint, or Type II tape the pavement upon which the markings are to be placed shall be dry, cleaned and properly prepared by sand or shot blasting, as a minimum, and to the extent recommended by the manufacturer so that all contaminants, loose debris, and other foreign material are completely removed. Surface preparation for any subsequent application shall consist of air blasting and brushing the roadway surface to remove all loose dirt, mud or other debris and to dry the surface. Each additional application of paint shall be applied over the previously painted stripes.

Prior to placing the temporary pavement markings on the prepared surface, the Contractor shall layout, spot or string line the proposed temporary marking location. The temporary markings shall be aligned in such a way as to provide a smooth and gradual transition to and from the existing markings, and throughout both straight and horizontally curved sections of the project.

2. The material used for temporary paint marking shall be a commercially available acrylic resin Type II traffic paint that dries to no pickup in 4 minutes and shall be applied with a minimum of 6 pounds (0.7 kg) of glass beads per gallon (liter). The paint shall be applied at a minimum width of 4 inches (100 mm) and a wet thickness of approximately 15 mils (380 μ m) {approximately 16.5 gallons (39 liters) of paint per mile (kilometer) of solid line}. The equipment used to paint the line shall be a machine designed for the purpose of applying long line traffic lane markings of the type, width and thickness required, and shall be self-propelled or truck mounted and be equipped with an adjustable guide-on to assure proper placement of the line. Hand application, walk behind equipment or towing of the equipment will not be allowed.

Temporary paint lines shall be used on new or existing concrete pavement and asphaltic concrete pavement.

Any temporary painted line or segment of line, placed before December 1, which fails to adhere to the roadway surface for a minimum of 60 days under normal vehicular traffic or which appears wavy, nonuniform, thin, poorly applied, misaligned, beadless or nonreflective, shall be replaced as directed by the Engineer. For temporary painted pavement markings placed between December 1 and March 15, the minimum time requirement shall be 15 days with the same conditions applicable. No direct payment will be made for replacement within the 60 day or 15 day warranty periods.

After the minimum 60 day or 15 day warranty periods, the Contractor may be required to repaint the temporary traffic markings, as directed by the Engineer. Direct payment will be made for each additional application. However, should the additional application fail within the 60 day or 15 day warranty periods, the provisions as stated in the previous paragraph shall apply.

The Contractor must begin each additional repainting application within 72 hours after notification by the Engineer. Should the Contractor fail to begin repainting within this 72 hour period, the Engineer may use State forces or hire a private contractor to repaint the temporary traffic markings. The Contractor will be assessed any costs above the contract unit price "Temporary Pavement Marking, Type Paint" incurred by the State as a result of performing the corrective action by others, and the project will be shut down until the painting is completed.

When painting is required with air temperatures between 38° F (3° C) and 50° F (10° C), the paint shall be heated according to the manufacturer's recommendation prior to application on the dry, clean and properly prepared pavement. Any paint application made when the air temperature is below 38° F (3° C) will be paid for by the State, even if the application falls within either the 60 day or 15 day warranty periods previously described.

3. Temporary pavement marking tape Type II shall be a mixture of high quality polymeric materials and pigments, with glass beads throughout the pigmented portion of the film, and a reflective layer of high index of refraction glass beads bonded to the top surface. The film shall be precoated with a pressure-sensitive adhesive. Unless otherwise specified, the temporary pavement marking shall be 4 inches (100 mm) wide and the reflectorizing glass beads shall be incorporated to facilitate removal of the tape easily from asphalt and Portland cement concrete surfaces intact or in large pieces, at temperatures above 40° F (4° C), either manually or with a recommended roll up device. Removal shall be accomplished without the use of heat, solvents, grinding or sandblasting.

TEMPORARY TRAFFIC CONTROL FOR PERMANENT PAVEMENT MARKING (D-13-1007)

Paragraph 4. of Subsection 423.04 in the Standard Specifications is void.

WET REFLECTIVE POLYUREA PAVEMENT MARKING

I. Description

This work shall consist of furnishing and installing wet night retroreflective polyurea pavement markings in accordance with this provision and in conformance to the dimensions and lines shown on the plans or established by the Engineer.

The wet reflective polyurea marking material shall be applied by spray method onto asphaltic cement concrete and Portland cement concrete surfaces. Following an application of glass beads or black aggregate, and upon curing, the resulting marking shall be an adherent reflectorized stripe of the specified thickness and width that is capable of resisting deformation by traffic.

The Contractor shall field verify the pavement marking quantities required for the project prior to purchasing materials. The Department will not be held responsible for the Contractor's shortage or surplus of material. The Contractor's verification of quantities and purchasing material shall not delay the project or the installation of pavement marking when required.

II. Materials

A. Polyurea

Composition Requirements:

Composition requirements are per manufacturer's specifications. The Polyurea Pavement Markings approved for use are shown on the NDR Approved Products List. Markings which have not been previously approved by the Department will not be permitted on the project until approved by the Traffic Engineer.

Properties:

1. Color and Weathering Resistance: The mixed polyurea compound, white, yellow and black, when applied to a 3" x 6" aluminum panels at 15±1 mil in thickness with no glass beads or elements and exposed for 500 hours in a Q.U.V. Environmental Testing Chamber, as described in ASTM-G154, Cycle #1, shall conform to the following minimum requirements. The color of the white polyurea system shall not be darker than Federal Standard No. 595A-17778. The color of the yellow polyurea system shall conform to Federal Standard No. 595A-13538. The color of the black polyurea system shall conform to Federal Standard No. 595A-17038.
2. Track-Free Time (Laboratory): When tested in accordance with ASTM D 711, the polyurea marking material shall reach a track-free

condition in 10 minutes or less for a 15 mil thickness. This test shall be performed with AASHTO Type 1 beads coated at a rate of 0.099 pounds per square foot. The track-free time shall not increase substantially with decreasing temperature.

3. Adhesion to Concrete: The polyurea coating, when tested according to ACI Method 503, shall have such a high degree of adhesion to the specified concrete surface that there shall be a 100% concrete failure in the performance of this test. The prepared specimens shall be conditioned at room temperature ($75^{\circ} \pm 2^{\circ}$ F) for a minimum of 24 hours and maximum of 72 hours prior to the performance of the tests indicated.
4. Adhesion to Asphalt: The polyurea coating, when tested according to ACI Method 503, shall have such a high degree of adhesion to the specified asphalt surface that there shall be a 100% asphalt failure in the performance of this test. The prepared specimens shall be conditioned at room temperature ($75^{\circ} \pm 2^{\circ}$ F) for a minimum of 24 hours and maximum of 72 hours prior to the performance of the tests indicated.

B. Reflective Media

The reflective media application shall incorporate a double drop technique to maximize wet night reflectivity and color. The reflective media used shall ensure the wet reflective polyurea pavement markings meet the retroreflectance performance requirements in Section II.D.3. The glass beads for drop-on application shall conform to the following requirements *or be an approved equivalent*.

1. Glass Beads

The required glass beads shall be a 60/40 blend (60% sinkers and 40% floaters) of AASHTO M 247-81 Type I gradation 1.5 index glass beads. The glass beads shall have a minimum of 70% Rounds as measured according to ASTM D1155. Crush Resistance shall be measured according to the procedures of ASTM D1213 and shall be a minimum of 30 pounds retained on US #40 Mesh.

Acid Resistance: A sample of glass beads supplied by the manufacturer shall show resistance to corrosion of their surface after exposure to a 1% solution (by weight) of sulfuric acid. The 1% acid solution shall be made by adding 5.7 cc of concentrated acid into 1000 cc of distilled water. CAUTION: Always add the concentrated acid into the water, not the reverse. The test shall be performed as follows:

Take a 1" x 2" sample, adhere it to the bottom of a glass tray and place just enough acid solution to completely immerse the sample. Cover the tray with a piece of glass to prevent evaporation and allow the sample to be exposed for 24 hours under these conditions. Then decant the acid solution (do not rinse, touch, or otherwise disturb the bead surfaces) and dry the sample while adhered to the glass tray in a 150° F (66° C) oven for approximately 15 minutes. Microscopic examination (20X) shall

show not more than 15% of the beads having a formation of very distinct opaque white (corroded) layer on their entire surface.

2. Wet Reflective Media

Wet reflective media shall be approved for use by the polyurea manufacturer. The Wet Reflective Media approved for use are shown in the NDR Approved Products List.

C. Non-reflective Media

Black aggregate shall be broadcast to saturation on all black lines to provide a matte, non-reflective finish. The black aggregate shall be either a fine or medium gradation.

D. Finished Markings

Because of normal variances in road surfaces, application processes and measurement, the properties of markings made from the materials specified herein will vary from one installation to the next. When the materials are applied according to the specifications in Section III, they shall be capable of forming markings with the following reproducibility of properties:

1. On-the-road Track-Free Time: When installed at 77° F and at a wet film thickness of 15±1 mils, the markings shall reach a no-track condition in less than 10 minutes. Track-free shall be considered as the condition where no visual deposition of the polyurea marking to the pavement surface is observed when viewed from a distance of 50 feet, after a free-rolling traveling vehicle's tires have passed over the line. The track-free time shall not increase substantially with decreasing temperature.
2. Skid Resistance: The average initial skid resistance shall be 45 BPN or greater when tested according to ASTM E303.
3. Retroreflectance – Required initial retroreflectance values are shown in the table below. Typical retroreflectivity is determined as the average of many readings (mcd(ft-2)(fc-1)) metric equivalent (mcd(m-2)(lux-1)) as described below.

Average Minimum Initial Retroreflectance		
	White	Yellow
Dry (ASTM E1710)	500	350
Wet Recovery (ASTM E2177)	350	275
Wet Continuous (ASTM E2832)	100	75

- 3.1.1 Some reasonable variance should be expected (for example, application on very rough road surfaces or differences in glass beads).

- 3.1.2 The initial retroreflectance value of a single installation or unit of work shall be the average value determined according to the measurement and sampling procedures outlined in ASTM D7585, using a 30-meter (98.4 feet) retroreflectometer, except as modified below. The 30-meter retroreflectometer shall measure the coefficient of retroreflected luminance, R_L at an observation angle of 1.05 degrees and an entrance angle of 88.76 degrees. R_L shall be expressed in units of millicandelas per square foot per foot-candle [$\text{mcd}(\text{ft}^2)(\text{fc}^{-1})$]. The metric equivalent shall be expressed in units of millicandelas per square meter per lux [$\text{mcd}(\text{m}^2)(\text{lux}^{-1})$].
- 3.1.3 The initial retroreflectance values of the pavement marking shall be measured no sooner than 48 hours after application, but not later than 30 days after application. The Contractor shall provide an acceptable 30-meter retroreflectometer to use on the project (the retroreflectometer will remain the property of the Contractor). The contractor will take measurements in the presence of the Engineer. Prior to taking measurements, the Contractor shall calibrate the retroreflectometer according to the manufacturer's requirements.

Measurements will be taken at equally spaced (or nearly so) test areas located by the Engineer in each evaluation section. An evaluation section is defined as a 3 mile (or major fraction) portion of a segment. If the last evaluation section is less than 1.5 miles in length, it shall be combined with the preceding section.

The test areas shall be at least 400 ft. in length and a minimum of 10 readings shall be taken over the length of each test area.

All measurements shall be made in the direction of travel. On centerlines of undivided highways, measurements shall be taken in both directions in each test area and averaged to determine the value of that color line in that test area.

Measurements shall be taken for each type and color of line in the evaluation section.

Individual symbols and legends will be treated as separate evaluation sections. Three (3) readings shall be taken on each symbol to determine the average retroreflectance value for the symbol.

The Department will do verification testing. When the average of the readings for an evaluation section fall below the minimum, the entire section represented by those readings will be further evaluated by the Engineer and may be subject to removal and replacement.

- 3.1.4 The Department may elect to determine wet retroreflectance values measured under a "condition of continuous wetting" (simulated rain) in accordance with ASTM E2832. To reduce

variability between measurements, the test method shall be performed in a controlled laboratory environment while the marking is positioned with a 3 to 5 degree lateral slope. Measurements shall be reported as the average of the minimum of three locations. Samples of the completed finished product shall be applied to flat panels during application and brought back to the lab for testing. When such samples are taken, the Department will furnish the panels.

III. Application

The Contractor shall furnish equipment and apply the materials according to the following specifications:

A. Equipment:

Application equipment shall be capable of producing markings that meet the specifications of the manufacturers listed on the NDR Approved Products List for Polyurea Pavement Marking.

At any time throughout the duration of the project, the Contractor shall provide free access to his application equipment for inspection by the Engineer, his authorized representative or a materials representative.

When black and white polyurea are applied together to create a contrast pattern, they shall be applied from one truck in a single pass operation.

B. Application Conditions:

1. **Moisture:** The markings shall only be applied during conditions of dry weather and when the pavement surface is dry and free of moisture.
2. **Air Temperature:** The markings shall only be applied when road and air temperatures are above 40 degrees F, unless manufacturer's guidelines state otherwise.
3. **Surface Preparation:** Marking operations shall not begin until applicable surface preparation work is completed and approved by the Engineer.
 - 3.1 Prior to applying the markings, the Contractor shall remove any remaining existing markings to expose a minimum of 80% of the pavement surface.
 - 3.2 Prior to applying the markings, the Contractor shall remove all curing compounds on new Portland cement concrete surfaces.
 - 3.3 Prior to applying the markings, the Contractor shall remove all dirt, sand, dust, oil, grease and any other contaminants from the road surface.
 - 3.4 Application over temporary paint is not acceptable.

4. **Dimensions:** The pavement markings shall be placed only on properly prepared surfaces and at the widths and patterns as designated in the contract. The markings shall be applied in accordance with the "Manual on Uniform Traffic Control Devices" and in accordance with the Engineer's plans.

Any markings that are found to be 0.5 inches less than the width shown in the plans shall be removed and replaced by the Contractor.

5. **Other Restrictions:** The Engineer and/or Contractor shall determine further restrictions and requirements of weather and pavement conditions necessary to meet the all other application specifications and produce markings that perform to the satisfaction of the Engineer.
6. **Binder Thickness:** The polyurea binder (mixed Part A and Part B) coating shall be applied at rates to achieve minimum uniform wet thicknesses as follows:

Surface Type	Recommended Polyurea Pavement Marking Thickness (1 inch=1000 mils)
Existing Smooth Asphalt or Concrete Surface	20±2 mils
New Concrete Surface ¹	20±2 mils
New Asphalt Surface (Standard Asphalt Mix)	20±2 mils
Open Grade Friction Course (OGFC) or Stone Matrix Asphalt (SMA) ²	25±2 mils
Rough Concrete or Asphalt	22±2 mils
Concrete or Asphalt after Grinding Off Pavement Markings ³	22±2 mils

- ¹ Use thicker binder (20 mils) on new concrete surfaces with heavy tines.
- ² Very large aggregate sizes for open grade friction course or stone matrix asphalt mixes may require a thickness of 25 mils for proper coverage.
- ³ Pavement marking thickness determined by the type of surface and roughness/texture created from grinding operation.

7. **Reflective Media Application:** The Contractor shall ensure that the reflective media are properly set in the polyurea coating so that their exposed portions are free of polyurea coating material. The specified reflective media shall be dropped per the manufacturer's specified rates to achieve their recommended coating weights:

8. **Volumetric Proportioning:** The Contractor shall ensure proper proportioning as required by manufacturer's specifications and mixing of the polyurea components so that the markings are adequately hardened throughout and are free of soft or uncured material. Typically, such areas will darken over time from dirt and tire residue.
9. **Overspray:** The Contractor shall ensure the polyurea coating does not exhibit excessive overspray.
10. **Adhesion:** The Contractor shall ensure that the polyurea coating is well adhered to the road surface, and that the reflective media are well adhered to the binder.

IV. **Observation Period**

Following initial completion of all pavement marking, there will be a 180-day observation period before final acceptance. During the observation period, the Contractor, at no expense to the Department of Roads, shall replace any marking that the Engineer determines are not performing satisfactorily due to defective materials and/or workmanship in manufacture and/or application. At the end of the observation period the minimum required retention percentage for marking installed shall be 90%.

Determination of Percentage Retained - The percentage retained shall be calculated as the nominal area of the strip less the area of loss divided by the nominal area and expressed as a percentage of the nominal area. A claim, made by the State against the Contractor, shall be submitted to the Contractor in writing within 30 days after the 180-day observation period. When such a claim is made prior to August 1, the replacement material shall be installed during that same construction season. Replacement material for any claim after August 1, shall be installed prior to June 1, of the following year. Marking replacement shall be performed in accordance with requirement specified herein for the initial application, including but not limited to surface cleaning, sealer application, etc.

Final acceptance of all marking will include an inspection of the appearance of the markings during daylight and darkness. Any markings that fail to have a satisfactory appearance during either period, as determined by the Engineer, shall be reapplied at no expense to the Department of Roads.

Final acceptance of the pavement marking will be: (1) 180 days after the initial completion of all work, or (2) upon completion of all corrective work, whichever occurs last.

V. **Contract Units and Basis for Payment**

- A. Linear pavement markings will be measured in linear feet complete-in-place for the width specified.
- B. Arrows and Legends are measured by the each.

Subsection 423.05 of the Standard Specifications is amended to include the item:

"____ Polyurea Pavement Marking". Payment shall be full compensation for furnishing and applying all markings, and for all materials, labor, tools, equipment and incidentals necessary to complete the work.

Payment will be made under:

Pay Item	Pay Unit
____ Polyurea Pavement Marking	Linear Feet
____ Polyurea Pavement Marking	Each

Payment is full compensation for all work prescribed in this Section.

REMOVABLE WET REFLECTIVE TAPE, TYPE 4

I. Description

This work shall consist of furnishing and installing retroreflective preformed patterned pavement markings in accordance with this provision and in reasonably close conformance to the dimensions and lines shown on the plans and/or required by the engineer.

II. Materials - General

The preformed patterned markings shall consist of white or yellow films with clear microcrystalline ceramic beads incorporated to provide immediate and continuing retroreflection during both wet and dry conditions. This film shall be manufactured without the use of lead chromate pigments or other similar, lead-containing chemicals.

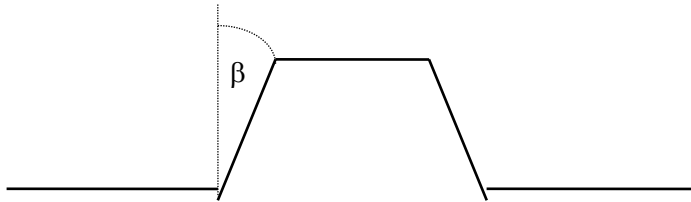
The quality of the pavement marking shall be such that the performance requirements for the marking shall be met. The markings shall be precoated with a pressure sensitive adhesive and shall be capable of being adhered to Asphalt concrete or Portland cement concrete at temperatures as low as 50°F (10°C) in accordance with the manufacturer's recommendations. When stored in a cool dry area indoors, the materials shall be suitable for use for one year after the date of purchase.

III. Classification

The removable retroreflective 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.)

IV. Composition and Retroreflectivity Requirements

Composition: The retroreflective pliant polymer pavement markings shall consist of a mixture of high-quality polymeric materials, pigments and glass beads distributed throughout its base cross-sectional area, with a reflective layer of microcrystalline ceramic beads bonded to a durable polyurethane topcoat surface. The patterned surface shall have approximately $20\% \pm 10\%$ of the surface area raised and presenting a near vertical face (β angle of 0° to 60°) to traffic from any direction. (See diagram below.) The channels between the raised areas shall be substantially free of exposed beads or particles.



Retroreflectance: The white and yellow markings shall have the initial expected retroreflectance values as shown in Table 1 under dry, wet, and rainy conditions. The photometric quantity to be measured shall be coefficient of retroreflected luminance (R_L) and shall be expressed as millicandelas per square foot per foot-candle $[(\text{mcd} \cdot \text{ft}^2) \cdot \text{fc}^{-1}]$. The metric equivalent shall be expressed as millicandelas per square meter per lux $[(\text{mcd} \cdot \text{m}^2) \cdot \text{lx}^{-1}]$.

Retroreflectance values shall be measured under dry conditions in accordance with the testing procedures of ASTM D4061.

Retroreflectance values shall be measured under wet conditions in accordance with ASTM E2176 or ASTM E2177. Wet retroreflectance values measured under a “condition of continuous wetting” (simulated rain) shall be in accordance with ASTM E2176, and to reduce variability between measurements, test method shall be performed in controlled laboratory environment while the marking is positioned with a 3 to 5 degree lateral slope. A wetting agent shall be used to improve wetting of the pavement marking by the water. It is recommended that a 0.1% by volume liquid soap solution be used. Measurements shall be reported as an average for each roll tested, in a minimum of three locations.

Wet retroreflectance values measured under a “condition of wetness” shall be in accordance with ASTM E2177, and the test may be performed with the marking installed on the road. New markings shall be tested using a wetting agent, as previously described. Laboratory measurements shall be performed using a 3 to 5 degree lateral slope. Measurements shall be reported as an average for each roll tested, in a minimum of three locations

Table 1
Expected Initial R_L under dry, wet, and rainy conditions

White	Dry	Wet & Rainy
Entrance Angle	88.76°	88.76°
Observation Angle	1.05°	1.05°
Retroreflected Luminance $R_L [(mcd \cdot m^{-2}) \cdot lx^{-1}]$	500	250

Yellow	Dry	Wet & Rainy
Entrance Angle	88.76°	88.76°
Observation Angle	1.05°	1.05°
Retroreflected Luminance $R_L [(mcd \cdot m^{-2}) \cdot lx^{-1}]$	300	200

Note: The test instrument shall use an Entrance Angle of 88.76° and Observation Angle of 1.05° which represents a simulated driver viewing geometry at a 30 meter distance.

Beads: Index of Refraction: All “dry-performing” microcrystalline ceramic beads bonded to the polyurethane-coated, patterned surface of the material shall have a minimum index of refraction of 1.70 when tested using the liquid oil immersion method. All “wet-performing” microcrystalline ceramic beads bonded to the polyurethane-coated, patterned surface of the material shall have a minimum index of refraction of 2.30 when tested using the liquid oil immersion method. The glass beads mixed into the pliant polymer shall have a minimum index of refraction of 1.5 when tested by the liquid oil immersion method.

Testing Procedure For Refractive Index of Beads By Liquid Immersion

Equipment Required:

1. Microscope (minimum 100X magnification)
2. Light source - preferably sodium light or other monochromatic source, but not absolutely essential
3. Refractive index liquids
4. Microscope slide and slide cover
5. Mortar and pestle

Procedure:

1. Using the mortar and pestle, crush a few representative beads and place a few of these crushed particles on a microscope slide.
2. Place a drop of a refractive index liquid, with an index as close to that of the glass as can be estimated, on the particles.

3. Cover the slide with a microscope slide cover and view the crushed particles by transmitted light normal to the slide surface (illuminated from the bottom).
4. Adjust the microscope mirror to allow a minimum light intensity for viewing. This is particularly important if sodium light is not used.
5. Bring a relatively flat and transparent particle into focus.
6. By slightly raising and lowering the objective (microscope tube), look for one or both of the following:
 - a. Becke Line - This light line will appear to move either into the particle or away from it. In general, if the objective is raised, the line will move toward the material of higher refractive index; if the objective is lowered, the line will move toward the material of lower index.
 - b. Variation in Particle Brightness - When raising the object from a sharp focus, the particle will appear to get brighter or darker than the surrounding field. If it becomes brighter, the glass has a higher refractive index than the liquid. If it becomes darker, the glass has a lower refractive index than the liquid. In both cases, the opposite will be true if the object is lowered.
7. This test can be used to confirm that the beads are above or below a specified index. It can also be used to give an accurate determination of the index (± 0.001). This is done by using several refractive index liquids until a match or near match of indices occurs. The index of the glass will equal that of the liquid when no Becke line and no variation in bead brightness can be observed.

The size and quality of the beads shall be such that the performance requirements for the retroreflective pliant polymer shall be met.

Acid Resistance: The beads shall show resistance to corrosion of their surface after exposure to a 1% solution (by weight) of sulfuric acid. The 1% acid solution shall be made by adding 5.7cc of concentrated acid into 1000cc of distilled water. **CAUTION:** Always add the concentrated acid into the water, not the reverse. The test shall be performed as follows:

Take a 1-inch x 2-inch sample, adhere it to the bottom of a glass tray and place just enough acid solution to completely immerse the sample. Cover the tray with a piece of glass to prevent evaporation and allow the sample to be exposed for 24 hours under these conditions. Then decant the acid solution (do not rinse, touch or otherwise disturb the bead surfaces) and dry the sample while adhered to the glass tray in a 150° F. (66° C.) oven for approximately 15 minutes.

Microscopic examination (20X) shall show no more than 15% of the beads having a formation of a very distinct opaque white (corroded) layer on their entire surface.

Color: The preformed markings shall consist of white film with pigments selected and blended to conform to standard highway colors.

Removability: The pavement markings 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 patterned surface of the retroreflective pliant polymer shall provide an initial average skid resistance value upon manufacturing of 45 BPN when tested according to ASTM E303 except values shall be taken in one direction and then at a 45° angle from that direction. These two values shall then be averaged to find the skid resistance of the patterned surface.

Patchability: The pavement marking material shall be capable of use for patching worn areas of the same type in accordance with manufacturer's instructions.

Thickness: The patterned material without adhesive shall have a minimum caliper of 0.075 inches (1.651mm) at the thickest portion of the patterned cross-section and a minimum caliper of 0.020 inches (.508mm) at the thinnest portion of the cross-section.



V. Installation

The markings shall be applied in accordance with the manufacturer's installation instructions. Marking configurations shall be in accordance with the "Manual on Uniform Traffic Control Devices." Tape shall not be installed unless the surface and air temperatures are in compliance with the manufacturer's specifications. Pavement markings shall be applied to clean, dry surfaces in accordance with the manufacturer's installation instructions or a method approved by the Engineer.

The Contractor shall have on the project at all times during the application of the removable pavement markings at least one employee with a valid American Traffic Safety Services Association (ATSSA) certification. The ATSSA certification may be for either a "Certified Pavement Marking Technician" or a "Certified Pavement Marking Specialist." The Contractor shall provide the Engineer a copy of the employee's certification prior to the beginning of work.

VI. Observation

During the project phase the markings are intended for, the contractor, at no expense to the Department of Roads, shall replace any markings that the Engineer determines are not performing satisfactorily due to defective materials and/or workmanship in manufacture and/or application. The installation of all markings will include an inspection of the appearance of the markings during daylight and darkness. Any markings that fail to have a satisfactory appearance during either period, as determined by the Engineer, shall be reapplied at no expense to the Department of Roads.

VII. Removal

Upon completion of the project or phase, the contractor shall remove the tape in whole. The removal procedure shall not damage the roadway surface.

VIII. Contract Units And Basis For Payment

Subsection 422.01 of the 2007 Standard Specifications is amended to include the item: “___ Removable Wet Reflective Tape, Type 4”. The price shall be full compensation for furnishing, installing, and removing all markings, and for all materials (including adhesive), labor, tools, equipment and incidentals necessary to complete the work.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
___ Removable Wet Reflective Tape, Type 4	Linear Foot

PERMANENT PAVEMENT MARKING

Section 423 in the Standard Specifications is amended to provide that for the items “___ Permanent Pavement Marking” the following materials may be used.

I. Concrete Roadways

For pavement markings being placed on concrete surfaces, “Preformed Pavement Marking, Type 4, Grooved”, “Preformed Pavement Marking, Thermoplastic”, or “Polyurea, Grooved” may be used. Approved preformed pavement markings are shown on the NDR Approved Products List. The material used shall be installed in accordance with the manufacturer’s specifications.

II. Asphalt Roadways

For pavement markings being placed on asphalt surfaces, “Preformed Pavement Marking, Type 4, Grooved”, “Preformed Pavement Marking, Thermoplastic”, “Thermoplastic, Grooved”, or “Polyurea, Grooved” may be used. Approved preformed pavement markings are shown on the NDR Approved Products List. The material used shall be installed in accordance with the manufacturer’s specifications.

Paragraph 1. of Subsection 423.05 is amended to include the following:

Pay Item	Pay Unit
___ Permanent Pavement Marking	Linear Foot (LF)
___ Permanent Pavement Marking	Each (ea)

Regardless of the material used it shall be measured and paid for as “___ Permanent Pavement Marking”.

MULTI-LAYER EPOXY POLYMER OVERLAY (G-19-0316)

Description

The work shall consist of preparing the surfaces of the reinforced concrete bridge deck and bridge rail, and furnishing and placing a multi-layer epoxy polymer overlay (EPO).

For bridges specified to receive both an EPO and sealing of the concrete bridge rails, the placement of the EPO shall be performed first. The penetrating sealer could inhibit the bonding of the epoxy to the concrete rails.

Materials

The EPO shall be comprised of a two component epoxy or epoxy/urethane blend (resin and hardener), combined with aggregate as described in the following:

1. Epoxy:

- a. The epoxy or epoxy/urethane blend shall be Type III, for use in bonding skid resistant materials to hardened concrete.
- b. Type III epoxy or epoxy/urethane blend shall comply with AASHTO M 235 (ASTM C 881), and shall meet additional requirements shown in Table 1.0 or Table 1.1, and is the class appropriate for the temperature at the time of application, as designated by the manufacturer.
- c. Provide Grade 1 or 2, 100 percent solids, thermosetting, moisture-insensitive epoxy, per ASTM D2369.

Table 1.0

ADDITIONAL REQUIREMENTS FOR TYPE III EPOXY POLYMER OVERLAY		
Property	Requirement	Test Method
Viscosity	7-25 poises	ASTM D2196, Brookfield RVT, Spindle 3 at 20 RPM
Gel Time	15-45 min.	ASTM C 881, ¶ 11.2.1 modified, 50 to 100 ml sample
Compressive Strength*, 3 hr.	1000 psi min.	ASTM C 579, w/ plastic inserts
Compressive Strength*, 24 hr.	5000 psi min.	ASTM C 579, w/ plastic inserts
Tensile Strength, 7 days	2000-5000 psi	ASTM D 638 @ 73 deg. F
Elongation, 7 days	40-70%	ASTM D 638 @ 73 deg. F
Elongation, 7 days	20% min.	ASTM D 638 @ 40 deg. F
Pull-Off Strength, after 24 hr. min. Cure Time of Layer 2.	250 psi min.	ASTM C1583 (using 50mm disks)
Epoxide Equivalent	≤200	ASTM D1652

*Mixed with aggregate.

Table 1.1

ADDITIONAL REQUIREMENTS FOR TYPE III EPOXY URETHANE BLEND		
Property	Requirement	Test Method
Viscosity	35-70 poises	ASTM D2196, Brookfield RVT, Spindle 3 at 20 RPM
Gel Time	15-45 min.	ASTM C 881, ¶ 11.2.1 modified, 50 to 100 ml sample
Compressive Strength*, 3 hr.	1000 psi min.	ASTM C 579, w/ plastic inserts
Compressive Strength*, 24 hr.	5000 psi min.	ASTM C 579, w/ plastic inserts
Tensile Strength, 7 days	2200-5000 psi	ASTM D 638 @ 73 deg. F
Elongation, 7 days	40-100%	ASTM D 638 @ 73 deg. F
Elongation, 7 days	20% min.	ASTM D 638 @ 40 deg. F
Flexural Creep, total, 7 days	0.0065 in. min.	California Test Method 419
Flexural Yield Strength	5000 psi min.	ASTM D790
Pull-Off Strength, after 24 hr. min. Cure Time of Layer 2.	250 psi min.	ASTM C1583 (using 50mm disks)
Epoxide Equivalent	≤200	ASTM D1652

*Mixed with aggregate.

- e. The Contractor shall submit for approval the following information to the Engineer:
- (1) Name, address and telephone number of the epoxy manufacturer. Include the name of the preferred contact person.
 - (2) Brand name of the material.
 - (3) Type, Grade and Class of the material.
 - (4) Manufacturer's certificate of compliance stating that epoxy components consist of 100% solids.
 - (5) Information regarding recommended usage and application instructions.
 - (6) Material Safety Data Sheets.
 - (7) Test results shall be submitted by a Cement and Concrete Reference (CCRL) or AASHTO Materials Reference (AMRL) accredited Laboratory. The certified lab will show test results of AASHTO M 235 (ASTM C 881) and requirements of Table 1.0 or Table 1.1, except for pull-off strength per ASTM C1583.
 - (8) A Fourier Transform Infrared Spectrophotometry (FTIR) spectrum in transmittance mode must be included for each component.
 - (9) Verification that the testing apparatus used for bond tests has been calibrated within the last year according to ASTM C900-06, Annex A1.

2. Aggregate:

- a. Provide a singly crushed siliceous gravel or chat that is free of dirt, clay and foreign of organic material.
- b. The Engineer shall collect a 60 lb. sample of the aggregate for use in quality assurance testing and acceptance. This sample shall be collected from the material delivered to the jobsite.
- c. The aggregates provided shall meet the requirements of Tables 2.0 & 3.0 below:

Table 2.0

QUALITY REQUIREMENTS FOR AGGREGATE		
Property	Requirement	Test Method
Sodium Sulfate Soundness, Maximum Loss	12%	AASHTO T104
Maximum Wear	30%	AASHTO T96
Acid Insoluble Residue, Minimum	55%	NDOR C25
Fine Aggregate Angularity, Minimum	40%	AASHTO T304, Method C
Moisture Content, Maximum	0.20%	AASHTO T255

Table 3.0

GRADATION REQUIREMENTS FOR AGGREGATES					
Surface	Sieve	4	8	16	30
Deck	% Passing	100	10-40	0-5	0-1
Sidewalk	% Passing	100	30-60	0-5	0-1

Equipment

The Contractor may request the use of other equipment or methods. The Contractor shall submit a list to the Engineer of all equipment to be used at least two weeks prior to construction. Equipment must comply with the following requirements.

1. **Surface Preparation Equipment:** Steel Shot-blasting equipment capable of producing a surface relief equal to the International Concrete Repair Institute (ICRI) Concrete Surface Profile (CSP) 5 to 6. The shot-blast equipment shall be capable of providing a uniform surface texture. The equipment shall be inspected before use, and worn blasting wheels and liners are required to be replaced. Steel shot is the consumed material. Coal Slag or other by-product material having a Moh's hardness of at least 6 is permitted. Refer to ICRI Technical Guideline No. 310.2-1997 for recommended diameter of steel shot. Loose shot shall be collected using a magnet, magnetic broom, air blast, vacuum or stiff bristle broom; discharging off the bridge deck will not be permitted. Wet methods are not allowed.
2. **Mechanical Distribution Equipment:**
 - a. All equipment to enter or cross the prepared surface, such as work vehicles, trailers, carts, etc., that contain motor oil, transmission fluid, gear oil, radiator fluid, lubricants, etc., shall be accompanied by a protection membrane such as

plastic tarps or rolled plastic placed on the prepared deck surface under equipment to protect the prepared deck surface from contamination.

- b. An epoxy distribution system shall be capable of accurate and complete metering, mixing and distributing the polymer at the specified rate on 100% of the prepared surface. Use an application machine that features positive displacement volumetric metering pumps controlled by a hydraulic power unit. Use motionless, in-line mixing so as to not overly shear the material or entrap air in the mix.
- c. An aggregate spreader shall be capable of uniform and accurate application of the dry aggregate over 100% of the prepared surface.
- d. An air compressor shall be capable of producing a sufficient amount of oil-free and moisture-free compressed air to remove all dust and loose material.

3. Hand Application Equipment:

- a. Calibrated containers for accurate measurement of epoxy components shall be used.
 - b. To minimize the formation of air bubbles produced during mechanical mixing of the epoxy components, the mixer shall only use paddle types "Jiffy" or "Sika" paddle types, or approved equal.
 - c. Adequate additional hand tools may be used to facilitate the placement of the EPO according to this specification and the manufacturer's recommendations.
4. Uniformly spread prepared mixture to the deck surface using 3/16" notched squeegees. Ensure squeegee blades are replaced regularly to maintain specified application rates.
5. Do not use power driven tools heavier than a 15 pound chipping hammer, during surface preparation.

Construction Method

1. Preparation of Surface:

- a. The Contractor shall determine the size of shot, flow of shot, forward speed of shot blast machine and number of passes to achieve a surface preparation that will satisfy the required pull-off strength of the EPO.
- b. Deteriorated and/or delaminated concrete shall be removed and repaired with EPO slurry (epoxy and aggregate combined) or approved patch material. The maximum depth of repair with slurry shall be limited to 3". No Magnesium Phosphate patch materials will be permitted.
- c. In all cases, the EPO shall not be placed on any Portland cement concrete less than 28 days old.

- d. All bridges will require, at minimum, a single-pass shot blast of the preparation surface. The Contractor shall produce a surface relief equal to the International Concrete Repair Institute (ICRI) Concrete Surface Profile 5 to 6. The width of overlap of successive passes of the machine shall be as minimal as possible to limit double exposure. The Contractor must make available to the Engineer, a set of ICRI surface profile cards to verify the shot blast profile.
 - e. Use abrasive blasting (no sand) and/or hand tools to clean sidewalks and small areas (curb lines, rail posts, under open rails, etc.) where shot blasting is unable to be performed, to the satisfaction of the engineer.
 - f. Metal deck drains and areas of the curb or railing above the proposed surface from the shot blast shall be protected.
 - g. All dirt, paint, oil, asphalt, laitance, carbonation, curing materials and other deleterious material from the surface of the deck and bridge rails (6" above deck or first break in the case of a continuous rail) shall be removed.
 - h. The Contractor shall clean all prepared surfaces by air blasting with dry, oil free air or vacuuming. Sweeping with brooms for final cleaning is not acceptable.
 - i. Any contamination of the prepared deck surface or surface of subsequent layers shall be removed. Contaminated areas shall be shot blasted or bush hammered to produce an acceptable surface for placement of the EPO.
 - j. The Contractor shall prevent rain water from transporting any objectionable materials from surrounding paving onto the bridge deck that may affect bonding of the epoxy.
 - k. Visible moisture on the prepared deck at the time of placing the EPO is unacceptable. The Contractor shall identify moisture in the concrete by taping an 18"x18" plastic sheet to the deck per ASTM D4263. The plastic sheet test shall be performed only when surface temperatures and ambient conditions are within the established parameters for application of the overlay system. In the event of rain, the concrete shall be allowed to air dry for a minimum of 24 hours prior to performing the plastic sheet test. This test shall be performed by the Contractor and observed by the Engineer. **The NDOR will allow a 4 hour test duration in lieu of the 16 hours specified in ASTM D4263.**
 - l. The first layer shall be placed within 24 hours of preparing the deck surface. Deck surfaces exposed for more than 24 hours must be re-cleaned by shot-blasting or abrasive blasting prior to application of the EPO. **NO abrasive blasting with sand will be permitted.**
2. **Proportioning:** All epoxy materials shall be proportioned according to the manufacturer's recommendations.

3. Placing the Epoxy Polymer Overlay:

- a. The EPO shall be placed in two separate layers to the surfaces shown in the Contract at application rates shown in Table 4.0:

Table 4.0

EPOXY POLYMER OVERLAY APPLICATION RATES		
Layer	Epoxy Rate	Aggregate Rate*
1	Not Less Than .22 gal./sq. yd. (40 sf/gal.)	10 lb./ sq. yd. min.
2	Not Less Than .45 gal./sq. yd. (20 sf/gal.)	14 lb./ sq. yd. min.

*Apply enough aggregate to completely cover the epoxy.

- b. Notched squeegees or mechanical application equipment shall be used to place the mixed epoxy on the deck surfaces immediately and uniformly at the prescribed rate.
- c. The Contractor shall continually monitor the gel time of the mixed epoxy. The EPO shall not be placed if conditions are such that gel time is less than 10 minutes.
- d. Deck drains shall be closed so the epoxy and aggregate shall not enter the drains.
- e. A paintbrush or roller shall be used to apply the epoxy on the face of curbs to the top of the curb. On bridges with continuous concrete barrier rails, apply the epoxy to the first break in the geometry of the barrier or 6 inches above the deck or existing overlay whichever is greater. On bridges with open concrete barriers, apply the epoxy to the following surfaces:
 - (1) All 4 faces of the posts a min. of 6 inches above the deck or existing EPO.
 - (2) The outside edge of deck.
 - (3) A minimum of 8 inches on the underside of the deck or slab overhangs.
- f. A single layer of Epoxy and aggregate shall be applied to curbs, barriers or posts during placement of layer 1. No aggregate is required for the outside edge or underside of deck overhangs.
- g. The bridge deck and all mixed epoxy and aggregate components must be a minimum of 60°F at the start of application. See paragraph 4.a.
- h. The dry aggregate shall be applied to cover the epoxy completely within 10 minutes of application.
- i. Any first layer surfaces of epoxy that do not receive enough aggregate before gelling of the epoxy occurs must be removed and replaced.
- j. Excess aggregate from the first layer after sufficiently cured shall be vacuumed or swept. If damage or tearing occurs, halt sweeping or vacuuming operation.

- k. Traffic must not be allowed on the first EPO layer.
- l. The epoxy and aggregate for the second layer shall be placed at the prescribed rate and in the same manner as the first layer and placed within 24 hours after the placement of the first layer. In the event of rain before the second layer is placed, the first layer shall be dried for 24 hours prior to placement.
- m. Second layer surfaces that do not receive enough aggregate before gelling of the epoxy may be re-coated with epoxy and aggregate.
- n. All longitudinal joints will be at the edge of one lane or as indicated by the Engineer. No joints will be allowed on the wheel path.
- o. The EPO shall be produced and placed within the specified limits in a continuous and uniform operation.
- p. All construction joints shall be taped to provide a clean straight edge for adjacent EPO placement. This includes joints between previously placed EPO materials and at centerline.
- q. The exposed edges at the ends of the bridge and at expansion joints shall be finished to minimize bridge deck roughness.
- r. A bond breaker shall be applied to all expansion joints.

4. Curing: Minimum curing times are noted in Table 5.0:

Table 5.0

EPOXY POLYMER OVERLAY CURE TIMES							
Temperature of Mixed Epoxy w/ Aggregate placed on Deck, F deg.							
Layer	55-59	60-64	65-69	70-74	75-79	80-85	85+
Minimum Cure Time (hours)							
1	5	4	3	2.5	2	1.5	1
2	6.5	6.5	5	4	3	3	3

- a. The temperature listed in Table 5.0 is to be taken no earlier than 30 minutes after the placement of epoxy on deck surfaces. The second layer shall be cured for 8 hours if the air temperature falls below 55°F during the curing period. The cure times listed for the 55-59°F temperature range are provided for the case where the deck, mixed epoxy, and aggregate satisfy the 60°F min. temperature at the start of placement and subsequently decrease during placement.
- b. The work shall be planned and performed in such a way as to provide for the minimum curing times specified in this provision or as specified by the epoxy manufacturer.

5. Temperature Limitations:

- a. The minimum temperature of deck, mixed epoxy, and aggregate at the start of placement of the EPO shall be 60°F.
- b. If the manufacturer's temperature requirements are more restrictive than provided in this provision they will govern.
- c. The EPO must not be placed when conditions are such that the deck temperature will exceed 105°F.
- d. The EPO must not be placed if conditions are such that gel time is less than 10 minutes.
- e. The EPO must not be placed if the air temperature is expected to drop below 55°F within 8 hours of placement.

- 6. Correction of Unbonded or Damaged Areas:** Any areas of the EPO discovered to be un-bonded by sounding or chaining and areas of the EPO damaged by the contractor's operation shall be repaired before payment is made. A squared perimeter of areas to be repaired shall be saw cut to the top of the concrete surface and the EPO shall be removed with small air tools (15 pounds maximum) or shot blasting. The underlying concrete area shall be shot blasted to remove contaminants, and the EPO shall be replaced according to standard placement procedures. There is no additional cost to the Department for repair of unbonded or damaged areas.

Temporary Pavement Markings

1. The Contractor shall use Overlay Markers ("Tabs") or Removable Wet Reflective Tape as needed to maintain traffic during phased construction operations.
2. If Overlay Markers are used, two markers shall be installed 5 feet apart at 40 foot intervals on centerline. Edge line markers shall be installed at 10 foot intervals.
3. Avoid installing Overlay Markers with high strength epoxy to avoid damage to EPO.
4. No grooving for temporary pavement tape will be allowed.
5. In the event that the temporary pavement markings are needed to be in place over winter, "Temporary Pavement Marking, Type Paint" shall be used. The removal of the temporary pavement marking paint shall be completed using a self-vacuuming water blaster. The placement and removal of "Temporary Pavement Marking, Type Paint" shall be at no additional cost to the Department. Removal of painted temporary pavement markings by shot blasting or grinding will not be allowed.

Bond (Pull-Off) Testing

1. The Contractor shall record the results of the pull-off tests.

2. The Contractor shall perform pull-off tests of three specimens on each lot of the completed overlay in accordance with ASTM C1583 (using 50mm pull-off disks) under the observation of the Engineer.

A lot shall be defined as follows based on the overall bridge length to receive EPO (end of floor to end of floor or end of paving to end of paving (if applicable):

Bridges < 500 ft, long:

A lot shall be defined as 1200 square feet of EPO per lane of traffic of the bridge and approach (if applicable),

Bridges ≥ 500 ft, long:

A lot shall be defined as 2400 square feet of EPO per lane of traffic of the bridge and approach (if applicable),

The following stipulations apply:

- a. Shoulders 8 feet and under shall be included in the lot containing the adjacent lane.
 - b. Shoulders exceeding 8 feet shall be considered a separate lot.
 - c. For lots less than 1200 square feet, no less than 3 specimens shall be tested.
3. The location of the three pull-off specimens per lot shall be determined by the Engineer.
 4. The loading disk used in the pull-off tests shall be adhered to the finished surface of the EPO following core drilling operation to a depth at least ½" into the concrete substrate.
 5. The pull-off tests shall not start any sooner than 24 hours after placement of the second layer of the EPO.
 6. The pull-off tests shall not be performed when the deck temperature exceeds 85° F.

Method of Measurement

1. Epoxy Polymer Overlay will be measured for payment by the square yard of deck surface and bridge approach surface area overlaid as determined by field measurement.
2. Epoxy Polymer Overlay applied to bridge rails or barriers and epoxy applied to the deck edge or deck underside will not be measured directly and will be considered subsidiary to the Multi-Layer Epoxy Polymer Overlay.

Basis of Payment

- | 1. | Pay Item | Pay Unit |
|----|--|------------------|
| | Multi-Layer Epoxy Polymer Overlay | Square Yard (SY) |
| 2. | For each lot, the EPO unit price is multiplied by bond strength pay factor for the item "Multi-Layer Epoxy Polymer Overlay". | |

3. The bond strength of the three (3) pull-off specimens will be averaged to determine the pay factor for each lot with the following exception:

If the tensile strength of a specimen is less than 250 psi and failure is in the concrete at a depth of at least 1/4 inch over more than 50% of the test surface, then the tensile strength used for that single specimen will be 250 psi.

4. The pay factors for the average bond strength test are as shown in Table 6.0:

Table 6.0

BOND STRENGTH PAY FACTORS	
Average Bond Strength of Lot *	Percent Pay
Greater than 245 psi	100%
235 psi - 245 psi	90%
225 psi - 234 psi	75%
Less than 225 psi	40% or Reject

*245 psi allows for a 2% margin of error (with 250 psi required)

5. Any lot rejected by the Engineer will be removed and replaced at no additional cost to the Department.
6. Temporary Pavement Markings shall not be measured and paid for directly but shall be considered subsidiary to Multi-Layer Epoxy Polymer Overlay.
7. Payment is full compensation for all work in this Section.

CONCRETE REPAIR (G-20-1015)

Description

This provision entails the repair of deteriorated or damaged concrete manifested as spalling, delamination, cracking, crushing or breakage. This type of repair shall consist of patching defective concrete with suitable materials. Concrete repair shall be performed at locations indicated on the plans and/or as authorized by the Engineer.

Material Requirements

Products appearing on the Approved Products List under "Pavement and Structural Patching Materials" may be used without further qualification. Products suitable for vertical and overhead placement are shown on a continuation of this list. Products used shall be prescribed by the manufacturer for the purpose for which they are to be used.

Equipment

Sand blasting equipment for cleaning of reinforcing steel and adequate tools for placement of repair material shall be used as needed. Effective mixing equipment shall be used for mixing concrete repair materials.

Construction Methods

The Contractor shall sandblast and clean all exposed reinforcing bars and all prepared concrete surfaces. All concrete surfaces that contact new material shall be clean and free of all contaminants, dust and laitance so as to ensure proper adhesion of the material to the concrete. The instructions of the repair product manufacturer shall be followed regarding preparation, installation and any precautions that pertain to safety or performance of the product.

Method of Measurement

All work done under the pay item "CONCRETE REPAIR" shall be paid for by the SQUARE FOOT (SF) of area, as determined by field measurement.

Basis of Payment

Payment for work done under the pay item "CONCRETE REPAIR" shall be paid at the contract unit price per SQUARE FOOT (SF). Payment shall be full compensation for all labor, equipment, tools, materials and incidentals necessary to do the work.

CRACK EPOXY INJECTION (G-22-1015)

Description

This provision covers the repair of deep cracks in concrete structures with epoxy based compounds. The concrete shall be thoroughly repaired by full depth injection of epoxy, where required, so as to restore structural integrity of the concrete.

Material Requirements

Epoxy compounds and adhesives are covered in Section 1018 of "The Standard Specifications for Highway Construction". Type I or Type IV products compatible with the epoxy injection process shall be chosen. Product viscosities should be compatible with the size and type of cracks to be repaired. The Approved Products List under "Epoxy Resin Bonding Systems" shows products that may be used without further qualification. The Engineer shall make the final determination as to product suitability for a specific purpose. It is recommended that, in case any uncertainty exists as to the suitability of a product, Bridge Division be contacted prior to ordering that product.

Equipment

Equipment shall be compliant with industry standards and prescribed by the product manufacturer for use in application of their products.

Construction Methods

Techniques should be used to inject approved epoxy resin compounds to the full depth of the cracks in concrete structures, as indicated in the plans. Methods shall be in accordance with industry standards and application of materials shall be as prescribed by the material manufacturer.

Before epoxy injection, the soundness of the concrete shall be investigated. Unsound concrete that may become unattached during injection shall be removed and exposed reinforcing steel cleaned. Areas where concrete is spalled or has been removed shall be repaired as per special provision "Concrete Repair". Subsection 1018.03 of "The Standard Specifications for Highway Construction" shall apply.

Method of Measurement

All work done under the pay item "CRACK EPOXY INJECTION" shall be paid for by the LINEAR FOOT (LF) of area, as determined by field measurement.

Basis of Payment

All labor, material, tools, equipment and incidentals shall be compensated under the pay item "CRACK EPOXY INJECTION". This item shall be paid for at the contract unit price per LINEAR FOOT (LF) of crack repaired.

PENETRATING CONCRETE SEALERS (G-30-1015)

Description

This work shall consist of furnishing and applying penetrating concrete sealers to Portland cement concrete at the locations shown in the plans or ordered by the Engineer, in accordance with the requirements of these specifications.

Material Requirements

The penetrating concrete sealer must be from the Approved Products List.

General Instructions

Instructions, given herein, shall be followed as a minimum requirement. The manufacturer's instructions shall be followed. The Engineer shall be the interpreter of these instructions, should conflict arise.

Preparation

1. Concrete, to be sealed, shall have cured for a minimum of 28 days.
2. All surfaces shall be thoroughly cleaned. Remove sand, surface dust, dirt, oil, grease, chemical films, curing compounds, coatings or other contaminants, with a high pressure water washer, capable of delivering water at not less than 2,000 psi. If high pressure water does not remove surface contaminants, sand blasting will be required at the Engineer's discretion.
3. Surfaces shall be allowed to air dry for a minimum of 48 hours.
4. A 2 ft. x 2 ft. clear plastic sheet shall be taped to a test area of the surface, as directed by the Engineer. The sheet shall be taped on all edges, to the cleaned concrete, for not less than 20 minutes. If, upon removal of the plastic sheet, moisture is observed on its

surface, additional drying time shall be required before application of penetrating concrete sealer.

5. The Engineer shall consult NDOR Materials and Research Division to determine if a Rilem Tube Absorption Test should be performed.
6. Test applications of the penetrating concrete sealer may be required at the discretion of the Engineer.

Application

1. Air, material and surface temperatures shall be 40° F (4° C) or higher during application. Penetrating concrete sealers shall not be applied when temperatures are expected to fall below 30° F (-1 C°) within 12 hours or when rain is expected within six hours. Do not apply sealer materials during wet weather conditions or if adverse weather conditions are anticipated within 12 hours of the completion of sealer application.
2. Typical limits of application shall be as indicated in the plans and in conjunction with instructions herein.
 - i) For superstructures with **open rails, without epoxy polymer overlay (EPO)**, penetrating concrete sealer shall be applied to:
 - (1) Outside edge of deck
 - (2) Underside of deck for a minimum of 8 inches from the outside edge
 - (3) Top, sides and bottom of rail
 - (4) All surfaces of posts
 - (5) Deck surfaces, underneath rails, not covered by an overlay of any type
 - ii) For superstructures with **open rails, with EPO**, penetrating concrete sealer shall be applied to top, bottom and sides of the rail and to all sides of the posts, except where EPO is applied, as shown in plans.
 - iii) For superstructures with **closed rails**, penetrating concrete sealer shall be applied to all accessible surfaces of the rails, except the portions where EPO is applied, as shown in the plans.
 - iv) Substructure components shall be sealed within the limits indicated in the plans.
3. Horizontal application: Penetrating concrete sealer shall be applied with low pressure sprayer (10 – 25 psi) or roller so as to thoroughly saturate the concrete surface. Sufficient quantity is indicated when the sealer stands for a few seconds before completely penetrating the concrete surface.
4. Vertical application: Apply from bottom up with low pressure sprayer (10 – 25 psi) or roller so as to thoroughly saturate the concrete surface and create a uniform wet appearance.

5. Precise application rates will vary with concrete mix, porosity, finish and environment, but may be estimated at 200 – 300 sq. ft. per gallon.
6. Drying time shall be a minimum of two hours for light traffic or by manufacturer's recommendation and may be extended at the discretion of the Engineer.

Method of Measurement

1. The pay item "Penetrating Concrete Sealer" is given in square feet (SF) calculated from dimensions shown in the plans or as-built plans.

Basis of Payment

Payment shall be full compensation for fulfilment of all that is defined in the contract documents and manufacturer's instructions.

- | | | |
|----|--|-------------------------------------|
| 1. | Pay Item
Penetrating Concrete Sealer | Pay Unit
Square Feet (SF) |
|----|--|-------------------------------------|

BRIDGE DECK REPAIR AND BRIDGE APPROACH REPAIR

Bridge deck repair and bridge approach repair are treated similarly in this provision, except where a distinction is made.

**CONCRETE BRIDGE DECK/APPROACH REPAIR
WITH CLASS 47BD 4000 CONCRETE**

Description

1. The work shall include removing unsound concrete, disposing of the old concrete, preparation of the repair area, and furnishing, placing, finishing, and curing the concrete for repairs to bridge decks and/or approaches.

Material Requirements

1. Materials shall conform to the requirements in Table A.

Table A

Material Requirements	
Applicable Materials	Section
Portland Cement Concrete	1002
Curing Materials	1010, 1011
Water for Concrete	1005
Adhesive	1018
Joint Sealing Filler	1014

2. The 47BD concrete may use Class F coarse aggregate shown in Table 1033.03A

Equipment

1. Surface preparation equipment shall be of the following types:
 - a. Concrete saws capable of sawing to a specified depth.
 - b. Sandblasting equipment able to remove rust and concrete from exposed reinforcing bars. The equipment shall also be able to remove loose and fractured particles from the prepared concrete surface.
 - c. Power-driven hand tools will be allowed with the following restrictions:
 - (1) Jackhammers greater than the nominal 60 lb (27 kg) class shall not be used.
 - (2) Jackhammers or chipping tools shall not be operated at an angle greater than 45 degrees measured from the deck surface.
 - (3) Chipping hammers greater than the 30 lb (13.5 kg) class shall not be used to remove concrete from around reinforcing bars.
2. Vibrating screeds, either mechanical or hand operated shall be used to finish the concrete.

Construction Methods

1. General Requirements:
 - a. No loads other than construction equipment shall be allowed on any portion of the concrete bridge deck or approach which has undergone preparation and removal of the old concrete surface. No construction load will be allowed which exceeds either an 8,000 lb (3625 kg) wheel load or a 16,000 lb (7250 kg) axle load. Any combination of axles closer than 4 feet (1.2 m) center-to-center will be considered to be one axle.
 - b. The Contractor shall take all necessary precautions to prevent damage to persons or property beneath the structure.
2. Concrete Removal Requirements:
 - a. All unsound concrete shall be removed from the concrete bridge deck or approach. When no overlay is indicated on the plan, the Contractor shall use a diamond blade to cut around the perimeter of the repair area to a depth of one inch. All repairs shall be cut so the edges are either parallel or perpendicular to the traveled way. When an overlay is indicated on the plan, saw-cutting is not necessary and edges shall be left irregular.
 - b. The Contractor shall remove, scarify or chip the concrete deck or approach to a minimum depth of two inches in any area requiring repair until all unsound

concrete is removed. Where scarifying equipment cannot be used, hand chipping will be required.

- (1) Care shall be exercised to prevent cutting or otherwise damaging any exposed reinforcing bars. Repairs to damaged reinforcing steel shall be performed by the Contractor as directed by the Engineer at no expense to the Department. Additional concrete removal and replacement necessary to repair damaged reinforcing steel shall be at no expense to the Department.
- (2) Any damaged epoxy coating of existing reinforcing steel shall be repaired according to Subsection 1021.03.

c. Defective concrete shall be removed in the following manner:

- (1) Where machine scarifying is employed to remove concrete, extreme care shall be used to avoid cutting reinforcing bars. Any damage caused by the Contractor shall be repaired by the Contractor as directed by the Engineer at no additional cost to the Department.
- (2) When existing reinforcing steel is encountered that is broken or has a section loss greater than 20%, the Contractor shall lap splice the existing bar with a bar of matching size. Lap splices shall be as given in the following table:

Bar #	Non-epoxy Length (in.)	Epoxy Length (in.)
4	15	18
5	20	24
6	26	31
7	33	39
8	45	54
9	59	71
10	74	89
11	95	139

The bar used to splice, shall lap, by the length given above, with a portion of the existing bar of which 80% or more of the full section is present, on either side of a break or deteriorated or damaged segment.

- (3) At points where removal of unsound concrete is adjacent to reinforcing bars or the removal of unsound concrete leaves over 2/3 of the bar diameter exposed, the removal shall be continued so that at least 3/4 inch clearance surrounds the bar allowing new concrete to bond to the entire periphery of the exposed bar.
- (4) Wherever removal of unsound concrete extends to the top of the bottom layer of steel, the remaining thickness shall be removed to the full depth of the bridge deck or approach.

- (5) When concrete removal goes lower than three inches from the bottom of the bridge deck or approach, the remaining concrete, in that location, shall be removed to full depth.
- (6) Any removals shall be carefully done to prevent damage to the bottom of the deck or approach and to leave removal boundaries which will allow complete filling with plastic concrete.

3. Preparation of the Surface:

- a. All debris and rubble resulting from bridge deck or approach removal shall be thoroughly swept up and disposed of. The Contractor shall sandblast all exposed reinforcing bars, all prepared concrete surfaces, and the portion of the bridge curb and all surfaces of steel roadway joints that will be in contact with the concrete. The remaining concrete surface and reinforcing bars shall be cleaned with compressed air, vacuum, brushes or other methods as necessary to produce a surface free of particles, dust, liquids or other contaminants.
- b. In cases where the placement of the concrete is delayed beyond 24 hours after the sandblasting has been completed, the formation of incidental rust on the rebars due to humidity or rain shall not be cause for re-sandblasting.

4. Forming:

- a. Forms shall be provided in areas where the removal goes through the entire depth of the bridge deck. Forms for small areas (1 square yard or less) may be wired to the reinforcing bars for support. Forms for larger areas shall be supported by blocking from the beams.
- b. Forms shall be provided as required to re-establish edges of approaches that have been removed. Voids discovered under approaches shall be filled with flowable fill concrete.

5. Placing Concrete:

- a. The Engineer shall inspect and be satisfied that all removal and preparation has been done in compliance with this provision.
- b. The clean dry vertical and horizontal faces of the repair shall be coated with Grade 2 Epoxy Adhesive from the NDR Approved Products List just before placing the new concrete.
 - (1) The epoxy adhesive shall be applied to the vertical sides of the repair with a brush.
 - (2) The epoxy application rate shall be limited so the epoxy adhesive does not become dry before it is covered with the new concrete.
- c. The Contractor shall furnish and place Class 47BD 4000 psi concrete for the deck or approach repair. The concrete shall be handled and consolidated so there will be no separation of the aggregate and the mortar.

- d. An internal vibrator shall be used to consolidate the concrete. Excessive vibration shall be avoided.
 - e. A vibrating screed shall be used on repairs 5 feet or wider to finish the concrete to the final elevation.
 - f. The surface shall be floated with a magnesium bull float. The surface shall be hand tined parallel to the existing tining in the deck or approach. If the deck or approach is to be overlaid prior to opening to traffic, no tining is required.
6. Sealing Joints:
- a. All transverse and longitudinal joints surrounding the repair shall be sealed and the work considered subsidiary to the pay item "Bridge Deck Repair" or "Bridge Approach Repair".
 - b. Sealing is not required if the repairs will be overlaid with asphalt or concrete.
7. Curing:
- a. The Contractor shall apply curing compound to all concrete deck or approach repairs.
 - b. The application rate shall be 1 Gal/200 SF
8. Smoothness:
- a. The elevation of deck or approach repairs shall be corrected in a manner that eliminates swales or bumps. Swales and bumps are defined as having 1/8 inch or greater deviation using an approved 10 foot straightedge. Corrective actions shall be completed by diamond grinding or replacement. The condition of the adjacent pavement shall be considered when evaluating the 1/8 inch deviation requirement.

Concrete bridge deck repairs will not be measured for payment, but shall be considered subsidiary to the item "Multi-Layer Epoxy Polymer Overlay".

PREPARATION OF BRIDGE AT STATION 140+75.77

Description

Preparation of the existing bridge structure(s) shall be in accordance with the pertinent provisions of Section 704 of the Standard Specifications.

Removal and Repair Items

The work shall include all work prescribed in the plans necessary to prepare the existing bridge for repair including but not limited to any of the following that apply:

- a. The removal of existing concrete bridge components as shown in the plans

- b. The saw-cutting and breaking back of existing concrete structures to the limits shown in the plans
- c. The cleaning and roughening of the existing concrete that comes into contact with the new work
- d. The cleaning, straightening and extending of the existing reinforcing steel into the new work
- e. The removal of expansion devices and/or expansion joint material, if removal is not covered elsewhere in the contract documents or manufacturer's instructions
- f. Installation of all missing bolts, nuts and washers as detailed in the plans.

Jackhammer Requirements

This paragraph shall apply to concrete removals for which specifications have not been provided elsewhere in the contract documents: When breaking existing concrete, the use of a 15 lb. maximum hammer applied at a 45° angle is required to chip along the edges of removal, and a 30 lb. maximum hammer applied at a 45° angle is required for all other concrete removal.

Exclusions

This provision shall not pertain to removals or preparation for some items of work that may be covered in other contract documents or manufacturer's installation instructions for those specific items.

Phasing

The existing structure may be used to maintain traffic during the phased construction. In such case, the work shall be done in phases according to the details shown on the plans.

Handling and Disposal of Materials

If there are lead plates under the existing steel rail posts, the lead plates shall be recycled in accordance with Subsection 203.01 Paragraph 3 (Environmental Requirements) of the Standard Specifications for Highway Construction, as prescribed for lead plates under existing bearings.

All other material resulting from the removal of specified bridge components; e.g., structural steel (painted or unpainted) shall become the property of the Contractor and shall be promptly removed from the right-of-way. It is the responsibility of the Contractor to handle materials that may contain toxic substances in accordance with federal, state and local regulations.

Extreme caution shall be exercised in removing the existing bridge components so that no material or debris falls or upon the roadway or into the channel (if so located) below the bridge. The Contractor shall take adequate precautions to protect all traffic and roadways.

Existing Reinforcing Encountered During Concrete Removal

When existing reinforcing steel is broken or has a section loss greater than 20%, the Contractor shall lap splice the existing bar with a bar of matching size. Lap splices shall be as given in the following table:

Bar #	Non-epoxy Length (in.)	Epoxy Length (in.)
4	15	18
5	20	24
6	26	31
7	33	39
8	45	54
9	59	71
10	74	89
11	95	139

The bar used to splice, shall lap, by the length given above, with a portion of the existing bar of which 80% or more of the full section is present, on either side of a break or deteriorated or damaged segment.

All existing reinforcing steel exposed during removal of defective concrete shall be incorporated into the new work. Such bars shall be blast cleaned to remove all rust and corrosion. The bars shall be either reformed, as required, to assume their original (intended) shape or bent to allow placement into the new work. Bars that are required to be cut shall be left as long as possible, reformed if necessary and incorporated into the new work. Deviations from these instructions shall be allowed only when clearly indicated in the plans.

For any reinforcing bar that has more than 2/3 of its diameter exposed, the existing concrete shall be removed so that a minimum clearance of 3/4" is provided all around the bar for the placement of new concrete.

CONCRETE SEALANT FOR PRESTRESSED GIRDERS

Description

This work shall consist of preparing the surfaces to be coated and furnishing and applying the Concrete Sealant to the designated surfaces of the girders as indicated in the plans. Surface preparation and sealant application shall be in accordance with the requirements of the coating manufacturer. The color shall be an approved grey or clear material from the list shown below. The Contractor shall conduct all work in strict compliance with all applicable federal, state, and local laws, codes, rules, and regulations.

Material Requirements

The concrete sealant shall be one of the following systems.

1. Sikagard 62 (Grey) as manufactured by Sika Corporation.
2. TK-2493 Hi-Tech Plus Epoxy as manufactured by TK Products.

General Instructions

The manufacturer's instructions for preparation and application shall be followed. The Engineer shall be the interpreter of these instructions, should conflict arise.

Test Evaluations for Approval

For approval, an epoxy product shall meet the following criteria:

1. Gel time: ASTM C881 – 30 minutes, minimum.
2. Viscosity: ASTM D1084 – 2000 to 4000 cps.

Approval of epoxy resins may be withdrawn because of deficient monitor test results, product changes made after original approval, or unsatisfactory field performance.

Method of Measurement

The pay item "SEAL EXPOSED GIRDER END" shall be paid for by the EACH (EA) for each girder end sealed, calculated from the number of girders to be sealed as shown in the plans.

Basis of Payment

All labor, material and equipment costs shall be paid at the contract unit price under the pay item "SEAL EXPOSED GIRDER END" by the EACH (EA).

**MAINTENANCE PAINTING
PART A: SURFACE PREPARATION AND PAINTING**

SUB-PART 1 - GENERAL

1.1 SCOPE

- A. This section specifies the requirements for the cleaning and painting of the US-275 Veterans Memorial Bridge (South Omaha Bridge) over the Missouri River, between Omaha, Nebraska and Council Bluffs, Iowa.
- B. This work consists of removal of mill scale and rust from all portions of the existing bridge as required in the plans; cleaning and painting the existing steel bridge superstructure to the limits shown on the plans; construction of any required containment facilities; and collection, site storage and disposal of debris generated during the removal of mill scale and rust from the structure. This work shall be done in accordance with this specification and as directed by the Engineer. The collected debris waste is not characterized as hazardous waste and is not subject to hazardous waste regulations.
- C. The Contractor shall furnish all labor, materials, equipment, services, and incidentals necessary to complete this work.
 - 1. The Contractor shall use an abrasive blast cleaning method to remove all mill scale and corrosion and to achieve a SSPS-SP 10 level of surface preparation (near-white blast cleaning) for the limits shown on the accompanying plans.
- D. The Contractor shall conduct all work in strict compliance with all applicable Federal, State, and Local laws, codes, rules and regulations, and as specified in this section.
- E. **References** - Publications referenced in this section, or appendices to this section include, but are not limited to, the following. Unless otherwise noted, the latest revision of the standards in effect at the time of letting apply.
 - 1. **American Society for Testing Materials**
 - a) ASTM D 3359 Standard Test Methods for Measuring Adhesion by Tape Test
 - b) ASTM D 4138 Standard Test Methods for Measurement of Dry Paint Thickness of Protective Coating Systems by Destructive Means
 - c) ASTM D 4285 Standard Test Method for Indicating Oil or Water in Compressed Air
 - f) ASTM D 4414 Standard Practice for Measurement of Wet Film Thickness by Notch Gages
 - g) ASTM D 4417 Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel

- h) ASTM D 4541 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
- i) ASTM D 4940 Standard Test Methods for Conductimetric Analysis of Water Soluble Ionic Contamination of Blast Cleaning Abrasives
- j) ASTM D 7091 Standard Practice for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to Ferrous Metals and Nonmagnetic Coatings Applied to Non-Ferrous Metals

2. Code of Federal Regulations (CFR)

- a) 29 CFR 1926 Occupational Safety and Health Regulations for the Construction Industry
- b) 29 CFR 1926.20 General Safety and Health Provisions
- c) 29 CFR 1926.21 Safety Training and Education
- d) 29 CFR 1926.59 Hazard Communication
- e) 29 CFR 1926.103 Respiratory Protection
- g) 29 CFR 1926.104 Safety Belts, Lifelines, and Lanyards
- h) 29 CFR 1926.105 Safety Nets
- i) 29 CFR 1926.352 Fire Prevention
- j) 29 CFR 1926.353 Ventilation and Protection in Welding, Cutting &
- k) 29 CFR 1926.451 Scaffolding

3. Society for Protective Coatings (SSPC)

- a) SSPC-PA 1 Shop, Field & Maintenance Painting
- b) SSPC-PA 2 Measurement of Dry Paint Thickness with Magnetic Gages
- c) SSPC-SP 1 Solvent Cleaning
- d) SSPC-SP 2 Hand Tool Cleaning
- e) SSPC-SP 3 Power Tool Cleaning
- f) SSPC-SP 10 Near-White Blast Cleaning
- g) SSPC-VIS 1 Visual Standard for Abrasive Blast Cleaned Steel

- h) SSPC-VIS 3 Visual Standard for Hand and Power Tool Cleaned Steel
- i) SSPC-Guide 6 Guide for Containing Debris Generated During Paint Removal Operations
- 4. Equipment and Coating Manufacturers' Published Instructions
- 5. Specification Section Part B: Worker Protection, Environmental Protection, and Waste Handling for Lead Paint Removal.

1.2 QUALIFICATIONS AND EXPERIENCE

- A. The Contractor performing the work of this section, shall have, within three (3) years preceding the project award date, successfully completed at least two projects of on-site surface preparation and coating application on structural steel bridges, similar in scale to this project.

1.3 GENERAL SAFETY

- A. The Contractor is responsible for the safety of the work under its control and supervision.
- B. The Contractor is responsible for the health and safety of its employees and its subcontractors' employees. The Contractor shall develop a safety and health program for all Contractor employees and subcontractors, addressing actual and potential hazards of the job site to comply with OSHA regulations, State and Federal laws.
- C. The Contractor shall designate a Contractor safety representative to conduct periodic/scheduled job-site safety briefings on a weekly basis or more frequently as deemed necessary and to participate in safety meetings when requested by the Engineer.
- D. The Contractor shall keep the work area in a clean, neat, and safe condition.
- E. The Contractor shall maintain accurate record files of accidents, occupational illnesses, fatalities, or OSHA citations.
- F. The Contractor shall equip personnel with safety clothing and proper respiratory protection as required for the work.
- G. The Contractor shall control hazards associated with sources of ignition. The Contractor shall use explosion-proof lighting and equipment, grounding and bonding systems on all generators, electrical cords, pumps, sprayers, etc. The Contractor shall prohibit smoking, matches, lighters, or other spark/flame producing items in the painting, curing, or storage areas. The Contractor shall establish fire prevention controls in accordance with Federal regulations specifically, 29 CFR 1926.352 and

other CFR that might apply for welding, cutting or heating in enclosed spaces, and when the application of flammable paints or compounds may create a fire or explosion hazard.

- H. The Contractor shall provide and maintain adequate ventilation during surface preparation, coating application, and curing phases of work to adequately remove dust and fumes to prevent injury to workmen or accumulation of volatile gases.
- I. The Contractor shall provide and maintain safe, secure rigging and scaffolding. The Contractor shall carefully evaluate all rigging and existing attachments for the type and magnitude of loads that will be imposed on the structure immediately prior to use. The Contractor assumes all responsibility for the use of any existing or added attachments.
- J. The Contractor shall pay specific and special attention to fall prevention and compliance with 29 CFR 1926.104, 29 CFR 1926.105, and 29 CFR 1926.451.
- K. The Engineer has the right to examine the site of any accident and to question any person having knowledge of any such accidents. The Engineer has the right, but not a duty, to make observations to verify that the safety and health requirements under this contract are being implemented and fulfilled. If inspections reveal deficiencies, the Contractor shall take immediate corrective action as may be required to correct the deficiencies. If Contractor fails or refuses to correct an unsafe or unhealthful condition, the Engineer has the right to stop all or part of work performed until satisfactory corrective action has been taken. The Engineer or Department will not be subject to claims by the Contractor, its employees, or its subcontractors as a result of this provision.

1.4 SUBMITTALS

- A. **Schedule** - (Refer to **Part A: Surface Preparation and Painting Appendix A**)

The Contractor shall submit Section A1.02, articles A, B, C, D, E and F at least 30 days prior to commencing any paint removal or cleaning work. The Contractor shall submit articles A1.03 and A1.04 as required.

- B. **Engineer Review** - The Engineer's acceptance of Contractor submittals does not imply acceptance of any particular method or sequence for conducting the work, or for addressing health and safety issues in the performance of the work. Submission of the programs by the Contractor does not relieve the Contractor from the responsibility to conduct the work in strict accordance with the requirements of this section, applicable laws, codes, rules and regulations, or to adequately protect the health and safety of all workers involved in the project, the public, and the environment. The Contractor remains solely responsible for the adequacy and completeness of the programs and work practices, and adherence to them.

SUB-PART 2 - PRODUCTS

2.1 MATERIALS

A. Coatings - Only the following coating systems shall be used.

1. The Contractor shall provide one of the following zinc coating systems to the truss members, truss bracing members, floor beams and stringers denoted on the accompanying plans:

PPG / Ameron Coatings

- | | | |
|----|---------------|--|
| a. | Prime: | Amercoat 68 HS, Zinc Rich Epoxy Primer |
| b. | Intermediate: | Amerlock 400 |
| c. | Finish: | Amercoat 450 H |

International Coatings

- | | | |
|----|---------------|-----------------|
| a. | Prime: | Interzinc 315B |
| b. | Intermediate: | Intergard 475HS |
| c. | Finish: | Interthane 870 |

Sherwin-Williams Company

- | | | |
|----|---------------|---|
| a. | Prime: | Zinc Clad III HS Organic Zinc-Rich Epoxy Primer |
| b. | Intermediate: | Macropoxy 646 Fast Cure Epoxy |
| c. | Finish: | Acrolon 218 HS Polyurethane |

2. The Contractor shall provide a finish coat in the color and gloss specified in the contract documents, with underlying coats in contrasting colors. It is imperative that the finish coat be produced in the same color and gloss throughout the duration of the Contract
3. The Contractor shall provide all paint materials in sealed, original, containers that are properly marked and labeled to allow verification with applicable material safety data sheets, application precautions, and instructions. Labeling shall include the manufacturer's name, type of material, brand name, color designation, date of manufacture, shelf life, contract or order number under which the material has been ordered, lot and batch numbers, quantity, handling, thinning, and application instructions.

B. Cleaning Agents and Detergents

1. The Contractor shall provide an ample supply of potable water to wash the bridge until all chlorides and foreign matter are removed. Detergents or cleaners and scrubbing may be needed in conjunction with water washing. Use detergents or cleaners that are compatible with the existing paint system and pre-approved by the new paint manufacturer. Apply

according to the product manufacturer's recommendations. Submit MSDS and any technical field guides for detergents or cleaners to the Engineer for review and approval before using. Thoroughly rinse the surface with water to remove detergent or cleaner residue prior to painting.

2. After water washing, remove oily or greasy residue that may remain using solvent according to SSPS-SP 1.

C. **Abrasives for Blast Cleaning**

1. Utilize hard durable abrasives, such as steel shot and/or grit, aluminum oxide or garnet abrasives, in order to encourage abrasive recycling and to minimize waste generated by the project. Use clean, dry abrasives that are free from contamination. Sand or coal slag shall not be used.
2. Used or recycled abrasives will only be accepted if the leachable quantity of each of the metals arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver, as determined by laboratory testing, is equal to or less than one part per million (1 ppm).

2.2 EQUIPMENT

A. **Surface Preparation Equipment**

1. The Contractor shall provide hand brooms, hand shovels, vacuum cleaners or other methods approved by the Engineer to remove accumulated foreign materials from the bridge prior to water washing. The Contractor shall include all necessary collection equipment to ensure removed material does not fall in the water or on the ground below the bridge.
2. The Contractor shall provide pressure washing equipment equipped with a zero-degree rotating tip. The Contractor shall include all support equipment needed.
3. The Contractor shall provide all necessary abrasive blasting equipment, properly sized hand tools such as chipping hammers and scrapers, or other tools as necessary to conduct the work as specified in this section. The Contractor shall include all necessary collection equipment.

B. **Paint Application Equipment**

1. The Contractor shall provide all spray equipment, rollers, brushes and daubers to conduct the work as specified in this section.

2.3 CONTAINMENT MATERIALS

- A. The Contractor shall supply all equipment and materials needed to contain the blast area, all blast media and blast debris, overspray, paint drips and spills. This

may include, but is not limited to: ground covers, rigging, scaffolding, planking, containment screens or tarpaulin materials, vacuum-shrouded power tools equipped with HEPA filtration, and HEPA-filtered vacuums.

- B. The Contractor shall use equipment that is clean and free of loose dust and debris when brought onto the construction site.

SUB-PART 3 - EXECUTION

3.1 TECHNICAL REPRESENTATION BY MATERIAL MANUFACTURERS

- A. The Contractor shall arrange for a qualified technical representative of the paint manufacturers to visit the site and perform inspections to verify that the quality of surface preparation and painting are satisfactory for the coating system. Visits are required during the pre-production surface preparation test evaluation, at the start of the project, at 10%, and 50% completion during the project, and as requested by the Engineer.
- B. The Contractor shall have the manufacturers summarize the results of the inspections in writing, together with recommendations. The Contractor shall provide copies of the manufacturer's reports to the Engineer within 7 days after the inspection.

3.2 CONTAINMENT AND PROTECTION OF SURFACES AND SURROUNDING PROPERTY

- A. Perform surface preparation activities, except for vacuum blasting, within a full enclosure. Design the full enclosure as a system including:
- The frame work and outer covering,
 - Attachments to the structure and supporting foundations,
 - Waste handling, and
 - Ventilation, if required.
- B. Abrasive blasting using conventional equipment will require a system of total containment of the blast area.
- C. When feasible, the Contractor shall use the same containment system for both abrasive blast surface preparation and the application of the coatings to prevent paint droplets or overspray from escaping the work area. The Contractor shall vent the containment during spray application using a suitably sized fan and dust sock, or employ paint arrestor filters on the dust collector intake. The Contractor shall carefully monitor the dust sock or dust collector during spray painting operations to assure that explosion hazards due to solvent concentrations do not exist.
- D. Impermeable cover materials, such as tarpaulins, drop cloths, or other approved materials shall be used on or above the ground, waterways, and other surfaces. The Contractor shall be responsible for recovery of material from all areas used for containment and recovery. All areas over which cover material is placed must be thoroughly cleaned of all debris before work is begun. All containment and recovery areas shall be closed to the public.

- E. Where vacuum blasting is used in lieu of containment, the Contractor shall use containment materials as necessary to assure that vehicles, structures, buildings, equipment, hardware, fixtures, and other materials are protected against blast media, paint spillage, overspray, and other damage.
- F. In addition to containment materials, the Contractor shall use protective coverings, shields, or masking as necessary to protect bridge surfaces that are not designated to receive surface preparation or coating.
- G. The Contractor shall use only fire resistant, self-extinguishing materials.
- H. The Contractor shall maintain all protective coverings during the entire period the work is being performed to prevent losing debris through rips, tears or breaks in the coverings. Remove all coverings upon completion of the work.
- I. The Contractor shall remove debris from the containment materials and equipment prior to relocation to another point along the structure. The Contractor shall clean to the extent that debris or dust is not dislodged by winds or physical contact during handling and transportation.
- J. Removed material shall not fall on the ground or on the surface waters.
- K. The Contractor shall describe all proposed containment and protection plans in the submittals. Include in the Containment Plan an enclosure description that describes the method to capture, accumulate and contain all spent abrasives and blast waste. Include a description of containment materials, material strengths, and drawing of attachments to the bridge including abutments, piers, deck and beams.
- L. The Contractor shall ensure any enclosure complying with, or comparable to, an SSPC Class 3 or better is designed and sealed by a Professional Engineer who is qualified in structures. Ensure ventilation in a Class 2 or better containment is designed and sealed by a Professional Engineer who is qualified in ventilation.
- M. The Contractor shall have the existing bridge structure analyzed under the seal a Professional Engineer licensed in the State of Nebraska. The purpose is to evaluate and limit the loads and stresses imposed on the existing bridge structure by the containment system including wind load, erection loads, blast waste, worker and equipment live loads, as well as the existing structure dead loads, HS20-44 live loads, and impact loading all in accordance with the American Association of State Highway and Transportation Officials - Standard Specifications for Highway Bridges, current edition and all interim specifications. The Engineer will provide structural plans to the contractor upon request.
- N. The Contractor shall suspend containment materials or platforms from the bridge structure or parapet walls only when a structural analysis conducted by the Contractor confirms that the bridge components have adequate capacity. The Contractor shall make any attachments to the structure using rollers, hooks, slings, clamps or other methods which will not require welding or drilling

of holes in either the steel or concrete. The Contractor shall protect parapets from any scraping or gouging damage when hanger mechanisms are used.

- O. If a suspended or elevated platform is constructed to serve as the base of the containment, the Contractor shall verify that the platform and its components are designed and constructed to support at least four (4) times its maximum intended load without failure with wire cables capable of supporting at least six (6) times their intended load without failure. The Contractor shall strictly follow all applicable OSHA regulations regarding scaffolding. The Contractor shall cover the platform or scaffolding with water impermeable materials.
- P. When containment materials are used, the Contractor shall secure them firmly to the bridge to avoid being dislodged during heavy winds. If containment materials become dislodged, the Contractor shall stop work immediately and secure the loose containment materials.
- Q. When sustained winds are 40 mph or above, the Contractor shall drop and secure the containment materials.
- R. The Contractor shall strictly follow all applicable OSHA regulations regarding the installation and daily inspection of scaffolding, platforms, and wire cables. The Contractor shall maintain a daily log of the results of the inspections made each shift, and after any occurrence which could affect the structural integrity of the scaffolding or wire ropes.
- S. The Contractor shall be responsible for the cleanup of any spills of removed material. All cleanup shall be done at no cost to the State and to the satisfaction of the Engineer.
- T. All costs associated with furnishing the impermeable cover materials, drapes, anchors, supports, and all other materials necessary for the containment enclosures, as well as installing and removing of the containment enclosures, shall not be paid for directly but shall be considered subsidiary to the items for which direct payment is provided.

3.3 LIGHTING

- A. The Contractor shall maintain all bridge lighting systems operational throughout the project. Lighting includes navigation lights, aerial lighting, and roadway lighting.
- B. If existing lighting will be concealed (e.g., navigation lights), the Contractor shall install temporary lighting. The Contractor shall provide the lighting plan to the Engineer for approval in advance.
- C. The Contractor shall provide adequate lighting for all surface preparation, paint application, and inspection work. The Contractor shall maintain a minimum of 10 foot-candles for surface preparation and painting, and a minimum of 30 foot-candles of general area lighting for inspection.
- D. The Contractor shall increase the lighting if workers or inspectors have difficulty in seeing. The Contractor shall use explosion-proof lighting.

3.4 PROTECTION OF BRIDGE DRAINAGE SYSTEM

- A. The Contractor shall protect storm sewers and drain inlets from debris generated by project activities. The Contractor shall keep all protective systems clean and operational throughout the entire project. At the end of each workday at a minimum, the Contractor shall remove all visible debris from the protective devices or from areas where rainwater could carry the debris into drains or storm sewers. The Contractor shall conduct more frequent cleaning as directed by the Engineer.
- B. The Contractor shall identify the methods that will be used to route run-off from the existing deck drains, if present, through the containment enclosure. The Contractor shall not close any bridge deck drains without the explicit approval of the Engineer.

3.5 WORK OVER WATER

- A. When working over or near water, the Contractor shall use water booms to contain inadvertent spills or releases of dust and debris unless prohibited by navigation lanes. In these cases, the Contractor shall use a boat with a skimmer to collect fugitive materials. The Contractor shall remove all project-related dust and debris from the surface of the water or from sediment at the end of each workday at a minimum. The Contractor shall conduct more frequent cleaning, if directed by the Engineer.
- B. Coast Guard Issues and Notification
 - 1. Perform work so that the free flow of navigation is not interfered with and navigable depths are not impaired. Advance approval from the Coast Guard is required any time that the work necessitates partial or total restrictions to the movement of vessels beneath the bridge. The Contractor shall provide the Coast Guard with the request at least 30 days prior to the need to commence such activities.
 - 2. Immediately remove any material, machinery, plant or appliance which is lost, thrown from the bridge, sunken or misplaced during the progress of work, and which, in the Engineer's opinion, may be dangerous or obstructive to navigation. Immediately notify the Engineer and provide a description and location of the obstruction. When required, mark or buoy such obstructions until obstruction is removed.
 - 3. Ensure floating equipment working in the channel displays lights and signals as required by the current Inland Navigational Rules. Ensure work does not interfere with displaying the navigational lights on the bridge at night.
 - 4. Take positive precautions to prevent spark producing, flame producing, lighted or other damaging objects from accidentally dropping onto barges or vessels passing beneath the bridge. Cease all flame cutting, welding, and similar spark-producing operations over the channel when vessels are passing beneath the bridge.

5. The Contractor shall provide the Department and the Coast Guard with the distance that the containment will extend below the bottom of the bridge (e.g., below the bottom chord) when operating in the navigation channel. The Contractor shall maintain this distance to the absolute minimum required.
6. Unless otherwise directed by the Coast Guard, the Contractor shall design the containment to allow it to be moved out of the navigation channel within 24 hours of notification that ships needing additional clearance require passage.
7. The Contractor shall provide the Department and the Coast Guard with a 24-hour telephone number and contacts for discussions regarding the containment system.

3.6 SURFACE PREPARATION

A. Pre-Production Surface Preparation Test Areas

1. Prior to proceeding with production surface preparation operations, the Contractor shall conduct the abrasive blast cleaning and pressure washing in a representative test area(s) selected by the Engineer. The purpose is to establish the degree of cleaning that will be performed throughout the project as defined in these specifications. The Contractor shall thoroughly document the testing process photographically and in writing.
2. The Contractor shall arrange for representatives of the coating manufacturers to be present during this testing.
3. The Contractor shall not proceed with production surface preparation activities until the Engineer agrees that the test area(s) conform with the requirements of this section.
4. Throughout the duration of the project, the Contractor shall maintain the quality of cleaning established in the test areas, and as defined in these specifications.

B. Compressed Air Cleanliness

1. The Contractor shall provide compressed air that is free from moisture and oil contamination for use in any operation in which the air may impinge upon the surface.
2. The Contractor shall use the white blotter test in accordance with ASTM D4285 to verify the cleanliness of the compressed air. The Contractor shall conduct the test at least once per shift for each compressor system. Sufficient freedom from oil and moisture is confirmed if soiling or discolorations are not visible on the paper.

3. If air contamination is evidenced, the Contractor shall examine the work completed since the last satisfactory test for evidence of contamination, and conduct any necessary clean up or repair. Results of such tests shall be reported to the engineer on a weekly basis. The Contractor shall change filters, clean traps, add moisture separators or filters, or make other adjustments as necessary to achieve clean, dry air.

C. **Ambient Conditions** - The Contractor shall not conduct final surface preparation which exposes bare steel under damp environmental conditions, or when the surface temperature is less than 5°F greater than the dew point temperature of the surrounding air.

D. **Remediation of Chlorides**

1. Upon completion of surface preparation, the Contractor shall use the KTA SCAT Kit, or approved equal, to test representative surfaces which were previously rusted (i.e., pitted steel), and random painted surfaces for the presence of remaining chlorides, especially in the areas beneath the deck.
2. If chlorides are detected at levels greater than 10 micrograms per square centimeter ($\mu\text{g}/\text{cm}^2$), the Contractor shall continue to clean the affected areas until acceptable results are achieved. The Contractor shall remove chlorides from the surfaces by flushing the area with water.
3. The Contractor shall comply with the requirements of SSPC- SP 12, Low Pressure Water Cleaning. The Contractor shall use pressures from 3,000 psi to 5,000 psi holding the nozzle less than one foot from the surface at all times.

E. **Surface Cleaning Requirements**

1. SSPC-SP 10, Near-White Blast Cleaning
 - a) The Contractor shall use abrasive blast cleaning equipment to remove all mill scale and rust. SSPC-SP10 level of surface preparation shall be required on all surfaces to be painted shown on the accompanying plans.
 - b) The limits of blast cleaning shall extend a minimum of 3-inches beyond the required limits of painting so that there are no transition zones where new paint will be applied over areas that have not received the required SSPC-SP 10 surface preparation. Shield or mask this 3-inch exclusion zone for paint when applying paint.
 - c) The contractor shall perform surface preparation in accordance with the requirements of SSPC-SP10. Use dry abrasive blast cleaning equipment. The contractor shall obtain a blast profile (etched height) of 1.5 to 2.5 mils as measured by replica tape or surface profile compactor.
 - d) SSPC-VIS 1 will be used as an aid in determining the quality of cleaning.

- e) The Contractor is strongly encouraged to use an abrasive blasting system that incorporates abrasive recycling in order to reduce waste volume to the greatest extent possible.
- f) All deposited or spilled concrete adhering to the surface of existing structural members, and all concrete covering and adhering to the edge or the vertical surface of the girder top flanges, shall be removed and the surface shall be cleaned and prepared to a minimum a SSPC-SP 2 Hand Tool Cleaning finish.
- g) All removed material shall be collected and disposed of at an approved waste area in accordance with Federal, State and Local regulations. At no time shall this removed material be allowed to fall or be disposed of in the water or on the land below the bridge.
- h) The contractor shall use potable water for the washing to achieve a surface that is free of chlorides, bird droppings, grease, oil, or other surface interference material. The Contractor shall use detergents or additives as necessary followed by thorough rinsing with, clean, potable water to remove any residues. As necessary, the Contractor shall supplement the washing by scrubbing with a stiff bristled non-metallic brush and/or solvent cleaning in accordance SSPC-SP 1. Prior to use, the Contractor shall provide the Engineer with information on the proposed additives, detergents, or solvents.
- i) Clean and recycle blast media abrasive used during the project to the greatest extent possible. Employ a method to monitor dispelled air from the recycling system that samples and tests for total lead and particulate matter of 0.4 mils (10 μ m) and smaller. Blasting shall be suspended immediately if Engineer deems visible dust or particulate matter is in the air expelled from recycling equipment.

3.7 PAINT STORAGE, MIXING, AND HANDLING

A. Department Testing of Paint Samples

1. The Engineer reserves the right to conduct tests of the paint materials at any time during the period of field painting. The tests will be conducted to confirm that the material, as supplied, complies with the compositional information provided by the manufacturer in the original submittals. Any or all of the tests outlined in Appendix A may be conducted as well as any other tests that are deemed to be appropriate by the Department.
2. When the Department decides to conduct tests, the Engineer will collect a representative pint or quart sample of each component of paint(s) at the construction site. The samples will be transferred to metal containers, identified, sealed and signed in the presence of the Contractor.

3. If the laboratory test results show that the material being used does not comply with the compositional requirements provided in the Submittals, the Contractor shall be directed to stop painting, and to remove and repaint all surfaces coated with rejected paint, all at no additional cost to the Department.

B. Paint Storage

1. The Contractor shall store all flammable materials in approved storage containers at locations approved by the Engineer.
2. The Contractor shall store all paint, thinners, and solvents in accordance with OSHA regulations and the requirements of the paint manufacturer. The Contractor shall store the paint and solvents under cover, out of direct sunlight. The Contractor shall maintain the temperature between 40°F and 90°F, unless the requirements of the manufacturer are more restrictive.
3. The Contractor shall provide the size and number of fire extinguishers in proper proportion to the quantity of paint stored.
4. The Contractor shall use explosion-proof lighting fixtures in the storage area.
5. The Contractor shall not permit smoking in paint storage, mixing, and application areas.
6. The Contractor shall keep all containers of paint unopened until required for use.
7. The Contractor shall not open or mix paints in the storage area.
8. The Contractor shall not return mixed paints to the storage area.
9. The Contractor shall equip bulk containers for solvents and thinners with spring-loaded, self-closing, dispensing nozzles. The Contractor shall use Underwriter's Laboratories approved containers for transporting paint to mixing areas.
10. The Contractor shall not permit the accumulation of empty paint cans, combustibles, and other debris. The Contractor shall remove waste chemical solutions, oily rags, and waste daily.
11. The Contractor shall maintain containers used in storage of coatings in a clean condition, free of foreign materials and residue.
12. The Contractor shall keep storage area neat and orderly.
13. The Contractor shall take all necessary precautionary measures to ensure that workmen and work areas are adequately protected from fire

hazards and health hazards resulting from handling, mixing and application of materials.

C. Mixing and Thinning of Coating Materials

1. The Contractor shall not use paint that has exceeded its shelf life.
2. For paints stored at a temperature below the manufacturer's recommended temperature for paint application, the Contractor shall warm paints in accordance with the manufacturer's recommendations prior to mixing.
3. The Contractor shall utilize proper ventilation in the mixing area to prevent injury to workmen or the accumulation of volatile gases.
4. The Contractor shall mix all coatings in accordance with the requirements of the coating manufacturer using mechanical equipment such as a Jiffy mixer.
5. When using two component materials, the Contractor shall mix only complete kits. Mixing of partial kits is not allowed.
6. The Contractor shall not use two component materials beyond the pot life established by the manufacturer's written instructions.
7. The Contractor shall not thin any paints unless approved in writing by the paint manufacturer and the Engineer. If thinning is required and authorized, the Contractor shall use only those types, brands, and amounts of thinner stipulated by the coating manufacturer. The Contractor shall comply with state VOC limits after thinning.
8. The Contractor shall provide each coat of paint in a contrasting color to distinguish it from previously applied or existing coatings. The Contractor shall deliver paint ready mixed to approved tints and colors. Construction site tinting is prohibited.

3.8 COATING APPLICATION

A. General

1. The Contractor shall apply the coatings in accordance with the requirements of this section, the coating manufacturer, and SSPC-PA 1.
2. In the event of a conflict between the manufacturer's technical data and the requirements of this section, the Contractor shall comply with this section unless the requirements of the manufacturer are more restrictive. When the manufacturer's requirements are more restrictive, the Contractor shall advise the Engineer of the discrepancies in writing, and comply with the more restrictive requirement.

B. Quality of Surface Preparation and Time Restrictions Prior to Painting

1. The surface shall exhibit the specified degree of cleaning immediately prior to painting, the Contractor shall re-clean deficient areas.
2. The Contractor shall apply the prime coat to dry surfaces and on the same day (within 12 hours) that dry abrasive blasting was performed. If the surfaces are allowed to remain uncoated for 48 hours after pressure washing, or if dry abrasive blast cleaned bare substrate was allowed to remain uncoated for more than 12 hours, the Contractor shall re-clean the surface prior to painting.

C. Surface Cleanliness Between Coats

1. The Contractor shall thoroughly clean the surface of each coat prior to the application of the next to remove dirt, dust, and other interference material. The Contractor shall pay particular attention to the removal of detrimental residue from surfaces such as comers and pockets.
2. The Contractor shall clean the surfaces by brushing, vacuuming, or blowing down with compressed air. Note that the coatings may be slightly tacky, rendering methods such as vacuuming to be ineffective.
3. If grease or oil has become deposited on the surface of any of the applied coats, the Contractor shall remove by solvent cleaning in accordance with SSPC-SP1 prior to the application of the next coat.

D. Ambient Conditions During Coating Application - The Contractor shall apply coatings under the following conditions unless the requirements of the coating manufacturer are more restrictive. The Contractor shall not apply coatings under less restrictive conditions without written approval of the coating manufacturer, and specific written authorization from the Engineer.

1. Surface and Air Temperatures - Between 40°F and 100°F.
2. Relative Humidity - Less than 90%.
3. Dew Point- Surface temperature at least 5°F above the dew point temperature of the surrounding air.
4. Frost/Rain- The Contractor shall not apply coatings to surfaces containing frost or free standing water, or during rain, fog, or similar detrimental weather conditions.
5. The Contractor shall remove and replace any paint that is exposed to unacceptable conditions (e.g., rain or dew) prior to adequate curing.

E. Methods of Application - The Contractor shall apply all coats by the methods shown below, unless the methods recommended by the paint manufacturer

are more restrictive. In all cases, paint overspray, drips, splashes, and spills must be controlled.

1. Airless or conventional spray application - The Contractor shall use airless or conventional spray, as appropriate for the coating material. If conventional spray is approved for use, the Contractor shall verify that the compressed air supply is clean and dry as determined by the blotter test in accordance with ASTM D4285. When spraying, the Contractor shall use extreme care to avoid contamination of surrounding areas or property by overspray.
2. When airless or conventional spray application does not provide adequate coverage, supplement spray application with one or more of the following methods:
 - a) Brush application - The Contractor shall use round or oval brushes. The Contractor shall brush apply the paint using a series of small circles to thoroughly fill in all surface irregularities, and end with a series of parallel strokes to smooth the finish. On vertical surfaces, the Contractor shall make the final strokes vertically.
 - b) Roller application - The Contractor shall select a nap size and roller quality that will properly wet the substrate and produce a smooth, uniform film. The Contractor shall apply the coating in such a manner as to achieve complete and thorough coverage of the surface and all irregularities, and to achieve a smooth, uniform finish.
 - c) Daubers - On surfaces which are inaccessible for paint brushes, the Contractor shall use sheepskins or daubers especially constructed for the purpose.

F. Recoat Times

1. The Contractor shall apply each coat only after the previous coat has been allowed to dry as required by the manufacturer's written instructions, but as soon as possible to minimize the length of time that the coating is exposed to dust and contamination.
2. The Contractor shall not allow any coat to remain exposed for longer than the manufacturer's written instructions prior to application of the subsequent coat. If a coat exceeds the manufacturer's maximum recoat times for any reason, the Contractor shall remove and replace the coating. As an alternative, the Contractor shall provide written instructions from the coating manufacturer for the specialized preparation that can be undertaken (e.g., scarifying the surface) to properly prepare the surface to receive the next coat. The specialized steps can be undertaken only if approved by the Engineer in writing. The Contractor shall perform the specialized cleaning or removal and replacement of the coatings at no additional cost to the Department.

G. Coverage, Continuity, and Stripe Coating

1. The Contractor shall apply each coat at the proper consistency in a workmanlike manner to assure thorough wetting of the substrate or underlying coat, and to achieve a smooth, streamline surface relatively free of dry spray, overspray, and orange peel. Shadow-through, pinholes, bubbles, blisters, fish eyes, skips, misses, lap marks between applications, or other visible discontinuities in any coat are unacceptable, and must be repaired. Runs or sags may be brushed out while the material remains wet.
2. The Contractor shall thoroughly coat all surfaces with special attention to hard-to-reach areas and irregular surfaces. When coating configurations such as bolts and rivets, the Contractor shall apply the material from multiple directions to assure complete coverage.
3. When using spray application, the Contractor shall apply by brush or spray, a stripe coat of the finish to all edges, comers, welds, crevices, bolt threads, bolt heads, rivet and fasteners, and other surface irregularities. The Contractor shall apply the stripe coat prior to the application of the intermediate coat. The Contractor shall extend the stripe coat a minimum of one (1) inch from surface edges.

H. Wet Film Thickness - The Contractor shall use wet film thickness gages in accordance with ASTM D4414 to verify the thickness of each coat at the time of application.

I. Dry Film Thickness - The Contractor shall notify the Engineer regarding any conflicts between the manufacturer's recommended dry film thickness, and the thickness shown below. The decision of the Engineer will be final.

1. The Contractor shall apply each coat to the thickness specified below.

PPG / Ameron Coatings

- a. Prime: Amercoat 68 HS, Zinc Rich Epoxy Primer (3.0-5.0 mils DFT)
- b. Intermediate: Amerlock 400 (4.0-8.0 mils DFT)
- c. Finish: Amercoat 450 H (2.0-3.0 mils DFT)

International Coatings

- a. Prime: Interzinc 315B (2.0-6.0 mils DFT)
- b. Intermediate: Intergard 475HS (4.0-8.0 mils DFT)
- c. Finish: Interthane 870 (3.0-5.0 mils DFT)

Sherwin-Williams Company

- a. Prime: Zinc Clad III HS Organic Zinc-Rich Epoxy Primer (3.0-5.0 mils DFT)
 - b. Intermediate: Macropoxy 646 Fast Cure Epoxy (5.0-10.0 mils DFT)
 - c. Finish: Acrolon 218 HS Polyurethane (4.0-6.0 mils DFT)
2. The Contractor shall give special attention to assure that surfaces such as edges, comers, crevices, welds, bolt heads, rivets and fasteners receive a dry film thickness equivalent to that of flat surfaces.
 3. The Contractor shall measure the thickness of each coat using nondestructive magnetic dry film thickness gages in accordance with ASTM D 7091. The Contractor shall comply with SSPC-PA2 for the calibration and use of the gages, and the frequency of thickness measurements. Spot readings 120% of the specified maximum and 80% of the specified minimum are acceptable, provided the average thicknesses are within the specified tolerances.
 4. If there are questions regarding the non-destructive measurements of coating thickness, a Tooke Gage (destructive scratch gage) may be used when authorized by the Engineer. The Contractor shall conduct measurements in accordance with ASTM D4138, but limit the use of the gage to a minimum of locations. The Contractor shall mark and repair all damage caused by the destructive testing, whether created by the Engineer or the Contractor.
 5. The Contractor shall apply additional coating of the same type to areas of insufficient thickness. The Contractor shall use care during application to assure that all repairs blend in with the surrounding surfaces.
 6. Unless directed otherwise by the Engineer in writing, the Contractor shall remove excessive coating thickness and reapply the affected coat(s).

J. Coating Adhesion

1. The Contractor shall apply all coats in such a manner to assure that they are well-adhered to each other and to the substrate. If the application of any coat causes lifting of an underlying coat, or there is poor adhesion between coats or to the substrate, the Contractor shall remove the coating in the affected area to adjacent sound, adherent coating, and reapply the material.
2. If adhesion is questionable, the Contractor shall conduct adhesion tests in accordance with ASTM D3359 or ASTM D4541 as directed by the Engineer, and repair all test areas. The acceptance criteria for the testing will be established by the Engineer and the coating manufacturer. The Contractor shall replace all defective coating that is revealed by the testing.

3.9 REPAIR OF DAMAGED AND UNACCEPTABLE COATINGS

A. Surface Preparation of Localized Areas

1. The Contractor shall repair localized damage, corrosion, and unacceptable coatings.
2. The Contractor shall prepare the surface by solvent cleaning in accordance with SSPC-SP 1 using a solvent that is acceptable to the paint manufacturer. The Contractor shall follow by power tool cleaning to remove all loose material in accordance with SSPC-SP 3. Use SSPC-SP 2 hand tool cleaning for surface preparation only upon written approval of the Engineer.

B. Feathering of Repair Areas

1. The Contractor shall feather the existing coating surrounding each repair location. The Contractor shall feather for a distance of 1 to 2 inches to provide a smooth, tapered transition into the existing intact coating.
2. The Contractor shall verify that the edges of coating around the periphery of the repair areas are tight and intact by probing with a putty knife in accordance with the requirements of SSPC-SP 3. The Contractor shall roughen the existing coating in the feathered area to assure proper adhesion of the repair coats.

C. Coating Application in Repair Areas

1. When the bare substrate is exposed in the repair area, the Contractor shall apply two coats of primer and a finish coat to achieve the specified thickness.
2. When the damage does not extend to the bare substrate, the Contractor shall apply only the finish coat.
3. The Contractor shall maintain the thickness of the system in overlap areas within the specified total thickness tolerances.

3.10 HOUSEKEEPING AND WASTE DISPOSAL

- A. The Contractor shall not store any paint or equipment on bridge structures.
- B. At the end of each day at a minimum, the Contractor shall haul empty paint cans and other debris to the waste storage area.
- C. The Contractor shall remove all paint drips, splashes, and overspray from surfaces not intended to be painted. The Contractor shall remove by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

- D. The Contractor shall handle, store, transport, and dispose of all non-hazardous project waste in strict accordance with Federal, State and Local regulations. The Contractor shall comply with **Part B: Worker Protection, Environmental Protection and Waste Handling** of this specification for waste handling, storage, transportation, and disposal.

3.11 INSPECTION

- A. The Engineer will inspect all phases of the work to verify that it is in accordance with the requirements of this section. The Contractor shall facilitate this inspection as required, including allowing ample time for the inspections and access to the work. Inspections may include, but are not limited to, surface preparation, pre-painting cleanliness, paint application, dry film thickness, film appearance and continuity, and adhesion. The Contractor shall not proceed with subsequent phases of the work until the preceding phase has been approved by the Engineer.
- B. The inspection by the Engineer in no way relieves the Contractor of the responsibility to comply with all requirements of this section, and to provide comprehensive inspections of its own to assure compliance with the approved Quality Control Inspection Plan.
- C. The Contractor shall furnish, until final acceptance of the coating system, all equipment and instrumentation needed for self-inspection of all phases of the work.

3.12 ONE-YEAR ANNIVERSARY INSPECTION

- A. A One-Year Anniversary Inspection will be conducted approximately twelve months after tentative acceptance of the painting under the entire Contract. The Contractor shall participate in this inspection with the Engineer.
- B. The Contractor shall repair, at no cost to the Department, all locations where the coating exhibits disbanding, cracking, rusting, or other such defects, and perform all repairs in accordance with the requirements of this specification, and the coating manufacturer's written instructions.
- C. Final payment will be made following the completion of the work necessary to correct the deficiencies discovered during the One-Year Anniversary Inspection.

SUB-PART 4 – METHOD OF MEASUREMENT AND BASIS OF PAYMENT

4.1 METHOD OF MEASUREMENT

- A. The work of Maintenance Painting will not be measured by the Department. Quantities, in square feet, shall be provided for information only.

4.2 BASIS OF PAYMENT

- A. Payment for Maintenance Painting will be at the contract Lump Sum price for the item "PAINTING STRUCTURE AT STATION 140+75.77" and shall include the items listed below:
1. Bridge Cleaning for Painting – Payment for "PAINTING STRUCTURE AT STATION 140+75.77" shall be full compensation for furnishing materials, labor, and equipment to perform the work of Bridge Cleaning for Painting in accordance with contract documents.
 2. Surface Preparation of Structural Steel - Payment for "PAINTING STRUCTURE AT STATION 140+75.77" shall be full compensation for furnishing materials, labor, and equipment to perform the work of Surface Preparation of Structural Steel in accordance with contract documents.
 3. Containment
 - a) Payment for "PAINTING STRUCTURE AT STATION 140+75.77" shall be full compensation for furnishing materials, labor, and equipment necessary to install and maintain the containment during blast cleaning operations or surface preparation by other methods in accordance with contract documents.
 - b) For non-hazardous surface coatings, payment for "PAINTING STRUCTURE AT STATION 140+75.77" shall be full compensation for monitoring, sampling, testing, reporting, temporary enclosures, temporary storage of waste, and disposal of waste.
 4. Blast Waste Transport and Disposal – Payment for "PAINTING STRUCTURE AT STATION 140+75.77" shall be full compensation for furnishing materials labor and equipment to perform all work necessary for:
 - a) The proper transport of blast waste,
 - b) The proper disposal of blast waste,
 - c) Analytical testing of blast waste,
 - d) Obtaining all required permits and manifests, and
 - e) Preparation of permits and manifests.
 5. Painting of Structural Steel– Payment for "PAINTING STRUCTURE AT STATION 140+75.77" shall be full compensation for Painting Structural Steel including:
 - a) All materials, labor, equipment,

- b) Providing material acceptance documents, and
- c) Providing technical assistance in accordance with contract documents.

**PART A: SURFACE PREPARATION AND PAINTING
APPENDIX A - SUBMITTALS**

AI.01 GENERAL - The Contractor shall provide all submittals of this Appendix in writing to the Engineer minimum of 30 days prior to start of the project.

A1.02 PRE-CONSTRUCTION

A. Worker Safety and Health

- 1. The Contractor shall provide a written worker safety and health plan for the Contract in strict compliance with all regulatory and Contract requirements.

B. Surface Preparation / Painting Plan

- 1. The Contractor shall provide written procedures for conducting the work of this section including, but not limited to, bridge washing, abrasive blasting, coating mixing and application, stripe coating, coating repair, recoat times, and cleaning between coats.
- 2. The Contractor shall provide a comprehensive listing of the equipment that will be used for surface preparation and painting.
- 3. The Contractor shall identify the name and chemical composition of detergents or solutions that will be used in the wash water, if needed. Only detergents which are environmentally safe and which will have no adverse effect on aquatic life are acceptable. The Contractor shall submit the MSD (Material Safety Data) Sheets for the chemicals and detergents.
- 4. The Contractor shall identify the type of solvents that are proposed for use if needed for the removal of grease and oil. The Contractor shall submit the MSD Sheets.

C. Containment

- 1. The Contractor shall identify the methods of protection or work isolation procedures that will be followed to protect the environment, equipment, and property from exposure to surface preparation and paint overspray or debris.
- 2. The Contractor shall provide the plan for the use of staging and scaffolding to gain access to the work, including the proposed use of lift or boom trucks, and the methods that will be used for attaching any

containment materials to the bridge.

3. Submit three copies of the Containment Design to the Engineer for review and approval at least 30 days prior to erecting the enclosure. Address in the design the following elements:
 - a) Designed to transfer added wind and static loading safely to the bridge. Analyze the structure for gravity and wind loadings from the containment. Provide a copy of this analysis and all supporting calculations in the submittal. If the Engineer determines that the proposed enclosure could have detrimental effects on the structural integrity of the bridge, modify the design of the enclosure at no additional cost to the Department.
 - b) Designed and constructed to maintain negative pressures inside the enclosure during production blasting and to include an air filtering and dust collection system for all exhausted air, unless site specific data collected during actual blasting operations conclusively show a tight containment with negative air is not required.
 - c) Designed to provide engineering controls including ventilation to reduce airborne contamination to levels as low as feasible.
 - d) Designed to address rigidity, permeability, and support structure of materials used. Will also present the sealing method for containment joints and entryways.
 - e) Exhaust Air Filtration- When mechanical ventilation systems are used, filtration of the exhaust air is necessary, otherwise airborne particulate from the containment will exhaust directly into the surrounding air. Provide a filtration efficiency of 0.5 microns or better.

D. Coating Materials

1. The Contractor shall identify the coating materials to be applied.
2. The Contractor shall confirm that all materials in a coating system will be produced by the same manufacturer.
3. The Contractor shall provide the coating manufacturer's name, product names, product numbers, material product data sheets, VOC levels, and MSD sheets.
4. The Contractor shall submit a letter from the coating manufacturer that acknowledges the acceptability of the specified systems for the various substrate types to be painted and the acceptability of the specified methods of surface preparation.

5. The Contractor shall provide written application instructions from the manufacturers which include mixing and pot life requirements, specified thinners and thinner amounts, recommended application equipment, coating dry film thickness, and recoat times as a function of surface and air temperature.

E. Recycled Abrasives

1. If blast cleaning with previously used or recycled abrasives, obtain a representative sample of the abrasive and have the sample analyzed for TCLP leachable levels of arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver.
2. Submit laboratory's analytical report to the Engineer for approval prior to use.
3. Provide a written abrasive recycling work plan to the Engineer for approval. In this plan, list the equipment and process proposed for recycling and recovery of the abrasive and for monitoring air expelled from the recycling process.

F. Quality Control Inspection Plan - The Contractor shall submit a quality control inspection plan that will be followed to confirm that all work complies with the requirements of this section. The plan must include the following at a minimum:

1. Inspection organization chart including lines of authority and the experience, training, and qualifications of all quality control personnel.
2. Written inspection procedures for all phases of the work, including the frequency of inspections that will be performed, and the handling of non-conforming work.
3. Documentation procedures including samples of the actual inspection forms that will be used for work of this section.
4. Written description of equipment to be used for surface preparation and coating application inspection, calibration procedures, frequency of calibration, and the methods for handling equipment that is found to be out of calibration.

A1.03 CONSTRUCTION START-UP

- A. Surface Preparation, Paint Application and Inspection Demonstration -** Prior to performing work of this section, the Contractor shall perform the sample cleaning demonstration.

A1.04 CONSTRUCTION PHASE

A. Material Manufacturer's Site Reports

1. The Contractor shall submit to the Engineer, a copy of the field summary reports prepared by the coating manufacturer upon completion of each site visit.
2. The Contractor shall provide each report within one week after the visit.

B. Inspection Log or Report

1. The Contractor shall maintain a daily log or daily report of all quality control inspections and test results in compliance with the approved Quality Control Inspection Plan.
2. The Contractor shall submit a copy of the log or report form package to the Engineer each seven calendar days.

C. Containment Scaffolding Inspection Log

1. The Contractor shall maintain, and make available for review by the Engineer, a daily log of the inspections of scaffolding, platforms, and wire ropes in accordance with the OSHA requirements.
2. The Contractor shall conduct the inspections each shift, and after any occurrence which could affect the structural integrity of the scaffolding or wire suspension ropes.

PART B: WORKER PROTECTION, ENVIRONMENTAL PROTECTION AND WASTE HANDLING

SUB-PART 1- GENERAL

1.1 SCOPE

- A. This section specifies the requirements for the protection of Contractor workers, the public, and the environment from exposure to harmful levels of dust, and other components that are present in the surfaces being removed or repaired.
- B. The waste generated during the surface preparation operation is expected to contain dust, spent abrasives, and rust with constituents that must be managed in a manner to assure protection of human health and the environment. Non-hazardous wastes are expected to be generated during the project and will require special handling and disposal by the Contractor. Should testing results indicates a waste has been generated that exceeds hazardous waste criteria the Engineer shall be notified.

- C. Any test results provided in the contract documents are for bidding purposes only. The Contractor shall conduct its own monitoring and prepare plans, adjust worker protection, and establish work practices according to those results.
- D. The surface preparation methods covered by this section include dry abrasive blasting of structural steel including trusses and areas beneath the deck to the limits shown on the plans.

1.2 REFERENCES - The publications referenced in this Section include, but are not limited to, the following. Unless otherwise noted, the latest revision of the standards in effect at the time of bid apply:

A. Code of Federal Regulations (CFR)

- | | | |
|-----|--------------------|--|
| 1. | 29 CFR 1926 | Occupational Safety and Health Regulations for Construction |
| 2. | 29 CFR 1910 | Occupational Safety and Health Standards |
| 3. | 40 CFR 261, App II | Toxicity Characteristic Leaching Procedure |
| 4. | 40 CFR 262 | Standards Applicable to Generators of Hazardous Waste |
| 5. | 40 CFR 263 | Standards Applicable to Transporters of Hazardous Waste |
| 6. | 40 CFR 264 | Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities |
| 7. | 40 CFR 265 | Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities |
| 8. | 40 CFR 268 | Land Disposal Restrictions |
| 9. | 40 CFR 302 | Designation, Reportable Quantities and Notification |
| 10. | 40 CFR 355 | Emergency Planning and Notification |
| 11. | 49 CFR 171-179 | Hazardous Materials Transportation Act |

B. Environmental Protection Agency (EPA)

1. National Environmental Laboratory Accreditation Program (NELAP)
2. EPA Publication SW846 Test Methods for Evaluating Solid Waste- Physical/Chemical Methods
3. SW 846 Method 1311 Toxicity Characteristic Leaching Procedure (TCLP)

C. NIOSH Manual of Analytical Methods

1. Method 7048 Cadmium
2. Method 7082 Lead
3. Method 7300 Chromium
4. Method 7900 Arsenic

D. Society for Protective Coatings (SSPC)

1. Guide 6 Guide for Containing Debris Generated During Paint Removal Operations

E. American Industrial Hygiene Association (AIHA)

1. AIHA Laboratory Accreditation Program (AIHA-LAP) for Metals Analysis
2. AIHA Proficiency Analytical Testing Program (PAT) for Metals Analysis

F. Nebraska Department of Environmental Quality State Regulations

1. Title 128 Nebraska Hazardous Waste Regulations
2. Title 129 Nebraska Air Quality Regulations

G. Specification Section Part A: Surface Preparation and Painting

1.3 REGULATORY REQUIREMENTS

- A. The Contractor shall comply with the requirements of this section and all applicable Federal, State, and Local laws, codes, and regulations, including those of the United States Environmental Protection Agency (USEPA), Occupational Safety and Health Administration (OSHA), and the Nebraska Department of Environmental Quality (NDEQ).
- B. The Contractor shall comply with all applicable regulations even if the regulation is not specifically referenced herein. If a Federal, State, or Local regulation is more restrictive than the requirements of this Section, the Contractor shall follow the more restrictive requirements.
- C. Throughout the work of this section, representatives of the NDEQ, or other Federal, State, or Local agencies may be at the construction site and the area of work. The Contractor shall cooperate with and give assistance to such representatives as may be directed by the Engineer.

1.4 QUALIFICATIONS AND EXPERIENCE

A. Contractor

- 1. The Contractor performing the work of this section, shall have within three (3) years preceding the acceptance of the Contractor's Proposal, successfully completed at least two (2) contracts involving the handling, storage, transportation, and disposal of waste from surface preparation and painting projects on structural steel bridges similar in scale to this project.

B. Laboratory Qualifications

- 1. The Contractor shall confirm that the laboratory conducting waste analyses have NELAP certification, or American Industrial Hygiene Association (AIHA) accredited for industrial hygiene analyses.

C. **Certified Industrial Hygienist (CIH)** - The Contractor shall utilize a CIH to approve and stamp the Health and Safety Compliance Program. .

- 1. The Contractor shall confirm that the CIH holds a valid American Board of Industrial Hygiene (ABIH) certification.
- 2. The Contractor shall verify that the CIH has at least two years' experience on projects involving bridge cleaning and blasting that are similar in size and complexity to the work anticipated on this project.

1.5 SUBMITTALS

- A. **Schedule** - The Contractor shall provide all project submittals, as summarized in **Part B: Worker Protection, Environmental Protection and Waste Handling Appendix A**, at least 30 days prior to commencing any surface preparation or cleaning work.

- B. **Engineer Review** - The Engineer's acceptance of Contractor submittals does not imply acceptance of any particular method or sequence for conducting the work, or for addressing health and safety issues in the performance of the work. Submission of the programs by the Contractor does not relieve the Contractor from the responsibility to conduct the work in strict accordance with the requirements of this section, applicable laws, codes, rules and regulations, or to adequately protect the health and safety of all workers involved in the Project, the public, and the environment. The Contractor remains solely responsible for the adequacy and completeness of the programs and work practices, and adherence to them.

SUB-PART 2 - PRODUCTS

2.1 PERSONAL PROTECTIVE MATERIALS AND MONITORING EQUIPMENT

A. Monitoring and Testing Equipment

1. The Contractor shall supply the instrumentation needed for monitoring worker and area exposures.
2. The Contractor shall supply all equipment needed for the operation of all instrumentation and monitors (e.g., generators, batteries, power cords, fuel, etc.).
3. The Contractor shall use equipment that is clean and free of loose dust and debris when brought onto the construction site.

B. Personal Protective Equipment and Hygiene Facilities

1. The Contractor shall provide all Personal Protective Equipment (PPE) and clothing needed for Contractor workers, and for up to four Engineer representatives at each shift and is responsible for the proper maintenance, cleaning and disposal of such equipment.
2. The Contractor shall repair or replace PPE as required to assure that it continues to serve its intended purpose.
3. The Contractor shall use PPE and hygiene facilities that are clean and free of loose dust and debris when brought onto the construction site.

2.2 WASTE CONTAINERS

- A. **Non-hazardous Construction Waste** - The Contractor shall provide all containers for non-hazardous construction waste. The Contractor shall use containers that are free of loose debris when brought to the construction site. The Contractor shall verify that the containers are acceptable to the disposal facility.
- B. **Spent Solvents** - The Contractor shall provide containers for all spent solvents and construction liquids. The Contractor shall not mix spent solvents with spent abrasives, blast debris, water, or other waste.

SUB-PART 3-EXECUTION

3.1 CONSTRUCTION SAMPLING AND TESTING

- A. Obtain representative waste samples from the surface preparation process using the selected production blasting system and equipment. Have an accredited laboratory test waste material with the Toxic Characteristic Leachate Procedure (TCLP) using EPA SW-846 test method SW-1311, TCLP.
- B. Have waste samples analyzed for, at a minimum, the 8 priority metals. These metals are: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. No later than 12 calendar days following the first day of production blasting, provide the Engineer with analytical results of these tests as well as an estimated quantity of waste that is expected to be generated.
- C. Exposure Monitoring
 - 1. The Contractor shall collect representative personal-air samples at the beginning of the surface preparation work to determine employee exposures to metals that might be present in the work area. Tasks resulting in the potential exposure to toxic metals include, but are not limited to surface preparation activities (i.e., abrasive blast cleaning), cleanup, and debris handling operations. The Contractor shall collect and analyze samples at a frequency of one work shift duration per week.
 - 2. The Contractor shall protect workers during the initial monitoring to the anticipated exposure levels as dictated by 29 CFR 1926.62 and as specified below. The Contractor shall use the standards to establish a level of protection for metals that are found in the blast debris. OSHA has developed a comprehensive health and safety standard for specific metals (cadmium, chromium, lead, and inorganic arsenic). For the other metals believed present until proven absent through site specific sampling and analysis, the American Conference of Governmental Industrial Hygienists (ACGIH) has developed Threshold Limit Values (TLV) and OSHA's Permissible Exposure Limits (PEL) shall apply.
 - 3. The Contractor shall conduct periodic exposure monitoring of its workers and Engineer representatives, and provide written employee notifications within five days of receipt of results in strict accordance with the applicable OSHA standard for the metals of concern.

3.2 ENVIRONMENTAL COMPLIANCE - VISIBLE EMISSIONS AND RELEASES TO AIR, SOIL AND WATER

- A. **Assessment and Correction of Visible Emissions**
 - 1. The Contractor shall conduct visible emissions assessments as defined in this section, state regulations, and in accordance with 40 CFR 60, Appendix A, Method 22. Method PD/Lead A4 of SSPC publication 95-06, Project Design, provides guidance on visible emissions assessments.

2. The Contractor shall conduct the visible emissions assessments to account for all locations where emissions of dust might be generated, including but not limited to, the surface preparation and waste containerizing areas. At a minimum, the Contractor shall conduct two fifteen-minute observations per day.
3. Ensure the National Ambient Air Quality Standards for PM10 or visible dust are not violated. If it is violated, an issuance of a Suspension of Work notice will be used until appropriate corrective action is taken.
4. The Contractor shall not resume the emission-producing operations until the corrective action and repairs are inspected and approved by the Engineer.
5. Shut downs for noncompliance with environmental regulations or standards will not be cause for extensions in time or considered for delay costs.

B. Assessment and Correction of Spills or Releases to Soil, Water or Sediment

1. The Contractor shall conduct all activities so that spills or releases of blast debris to the soil, water, sediment, or storm sewers do not occur. Contamination of the ground, water, or river sediment from project activities is strictly prohibited. Project activities shall be carefully monitored and controlled to avoid environmental contamination include, but are not limited to:
 - The containment,
 - Dust collector,
 - Abrasive reclaimer,
 - Waste accumulation points (storage areas),
 - Satellite accumulation points,
 - Refueling locations,
 - Boat or barge access points, and
 - Paint handling, transfer, and mixing operations.
2. The Contractor shall visually inspect the construction site for releases of dust, blast debris, and other debris outside of the work area that have become deposited on surrounding property, structures, equipment, or vehicles; on the unprotected ground, soil, water or sediment; around storm sewers or drains; or in areas where rain water could carry the debris into storm sewers or drains.
3. The Contractor shall clean up blast debris on a daily basis at the end of each shift, or more frequently if directed by the Engineer. The Contractor shall clean up all blast debris, even if the debris is a pre-existing condition.
4. When releases are observed, in addition to cleaning the debris, the Contractor shall implement changed work practices involving the containment or other action to prevent similar releases from occurring in

the future. The Contractor shall not resume operations until the corrective measures have been inspected and approved by the Engineer.

5. The Engineer may conduct sampling and analysis to determine if any media has been impacted by the work. The Contractor will be advised if such testing and analysis will be performed. The ground (soil), will be considered to have been impacted by the work based on the laboratory analysis as described below:
 - a) Visible blast debris on the ground, water, or sediment.
 - b) The metals of concern have increased over the geometric mean concentrations established at the start of the work.

C. Reporting of Visible Emissions and Releases

1. The Contractor shall maintain and make available for the Engineer's inspection, a permanently bound daily log documenting inspections and the occurrence of unusual incidents, if any, at each work area(s).
2. The Contractor shall document in the log, all cases where work has been halted due to unacceptable visible emissions or releases, the cleanup activities involved, and the corrective action taken to avoid a recurrence. The Contractor shall provide a written report to the Engineer within 48 hours of the occurrence.
3. The Contractor shall summarize the results of the assessments in a monthly report. The Contractor shall identify the frequency of observations made, the methods of observation utilized, the name of the observer(s), and results. The Contractor shall include and summarize the documentation prepared for work stoppages due to unacceptable visible emissions or releases

3.3 WASTE HANDLING AND DISPOSAL

A. General

1. The Department is the generator of the waste for permitting purposes, and will provide the EPA identification number as necessary. The Contractor is responsible for the collection, handling, storage, transportation and disposal of all wastes.
2. The Contractor shall recover all waste products generated during cleaning and painting work, including but not limited to rags, tape, disposable coveralls, filters, sediment, blast debris, and paint cans.
3. The Contractor, with the approval of the Engineer, shall designate a location to store waste. The Contractor shall transport the waste to the secured storage area at the end of each working day at a minimum.

4. Paint wastes include all wastes generated by the project. These wastes include, but are not limited to:
 - a. Blast waste,
 - b. Material accumulated from filtering exhausted air,
 - c. Spent abrasive,
 - d. Containment material that cannot be decontaminated for reuse,
 - e. Material containers such as paint and solvent containers, and
 - f. Other wastes.
5. Consider all blast wastes as hazardous until after appropriate analytical data or Materials Safety Data Sheets are available showing conclusive evidence that the waste is below any regulated level for hazardous constituents, or is not initially regulated. Wastes are to be disposed of in a Subtitle D landfill.

B. Waste Handling/Sampling Provided by the Contractor

1. Deposit accumulated bridge cleaning waste in appropriately sized clean new or reconditioned containers with securely sealed lids meeting the requirements of Title 49 Code of Federal Regulations. Recover wastes daily and deposit the wastes into these temporary storage containers. Securely seal the containers to shield the contents from the elements at all times. Consolidate all waste material to a minimum number of containers.
2. Recover all residues and carefully transfer, ensuring no release of residues into the air or contamination of surrounding surfaces. Keep all containers containing residue closed and secured, except during the addition of waste. Ensure residues do not remain on bridge surfaces or on the containment material overnight.
3. Clearly mark all bridge cleaning waste containers in no less than 1-½ inch (40 mm) block letters stating:

PAINT WASTE
NONHAZARDOUS
(Date)

Note: The date shall indicate when waste was first put into the container.

4. Construct or furnish a secured temporary storage area of sufficient size for the contained waste material. Enclose temporary storage areas with an 8 foot (2.4 m) chain link fence or a roll-off box with a lockable cover. Plans for other secured temporary storage areas may be submitted to the Engineer for approval.

5. Locate the temporary storage area at a location the Engineer approves. Ensure the base for waste storage is above the extreme high water elevation, if constructed within a flood plain.
6. For projects that will generate less than 55 gallons (208 L) of waste, the fenced temporary storage area or roll-off box will not be required and the Contractor is responsible for securely storing the paint waste containers on-site during the project.
7. At, or prior to the conclusion of the work, obtain one representative sample of the waste material from each container. Combine samples so that one representative composite sample is made for every 5 waste containers. Submit composite sample(s) to a lab for a Toxic Character Leachate Procedure (TCLP) test for the 8 priority metals: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Provide the results of this analysis to the Engineer upon receipt. Maintain wastes on site and do not dispose of them until the Engineer has reviewed analytical data and approved of the disposal method.

C. Disposal of Removed Material (Waste)

1. Transport waste materials in approved containers from temporary storage to a lined Subtitle D landfill (for non-hazardous wastes) or Subtitle C, Treatment, Storage, and Disposal Facility (TSDF for hazardous wastes) which accepts bridge painting wastes. Transport the wastes to the landfill facility within 5 calendar days of completion of surface preparation operations.
2. Provide the Engineer with copies of delivery tickets and landfill invoices for all waste material generated by this project.
3. Dispose of all bridge cleaning wastes according to Federal, State, and local regulations.
4. This project is based on the best information available that wastes generated will be non-hazardous for disposal per 40 CFR 261. Disposal of hazardous bridge cleaning wastes will be by extra work according to Section 109.05 of the Standard Specifications. The Contractor shall collect and have analyzed, representative samples of each waste stream generated by the work.
 - a) Sample each waste stream during the project to ensure project goals are being maintained and that a disposal facility's need for waste characterization is being met.
 - b) Obtain all samples properly, prepare for shipment, and offer for transport using Chain-of-Custody procedures and protocol. Have an accredited laboratory, or a laboratory that participates in EPA's NLLAP, analyze all samples.
 - c) Provide all laboratory results to the Engineer as soon as they are received. Obtain an adequate number of samples and analyze

them to ensure any waste stream generated during this contract is fully characterized.

- d) Sample solid wastes and analyze using TCLP test for the 8 priority metals: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Perform any additional analytical methods required by the disposal facility.
- e) The Contractor shall test any wastewater generated for any analytical parameters required for disposal characterization by the disposal facility.

D. Laboratory Report

- 1. The Contractor shall include the following minimum information in each report: Identity of the waste stream(s) analyzed, the number of samples collected and tested, dates of sampling and testing, laboratory test procedures utilized, the names and signatures of the individuals collecting the samples and conducting the laboratory tests, and an interpretation of the test results.
- 2. The Contractor shall include copies of completed chain-of-custody forms with the documentation.

E. Non-Hazardous Construction Waste

- 1. The Contractor shall properly transport, and dispose of all non-hazardous construction waste.
- 2. The Contractor shall verify that waste is completely covered during transport.
- 3. If toxic metals or hazardous substances were detected during the laboratory testing, the Contractor shall notify the disposal facility that such metals or materials are present in the waste.
- 4. The Contractor shall comply with additional City regulations as applicable.

F. Wastewater Disposal

- 1. The Contractor shall provide containers for the collection and retention of all wastewater, including but not limited to the water used for steam cleaning, hygiene purposes, laundering of clothing if done on site, and equipment cleanup activities.
- 2. The Contractor shall filter visible blast debris and particulate from the water prior to placing it into the containers. Prior to disposal, test the water for total toxic metals and provide ample filtration (e.g., through a multi-stage filtration system ending in 5 microns or better if needed). The Contractor shall conduct the necessary laboratory testing as described above.

3. The Contractor shall make disposal arrangements with the local publicly owned treatment works (POTW), sanitation company, or other appropriate permitted facility. The Contractor shall provide the Engineer with documentation signed by an official of the facility stating that the facility will accept the waste, and that the levels of any metals remaining in the water are acceptable.

3.4 CLEANING OF MATERIALS, EQUIPMENT AND SURROUNDING PROPERTY

A. Equipment and Material Cleaning Requirements

1. The Contractor shall remove debris from the containment materials and equipment prior to relocation to another point along the structure. The Contractor shall clean to the extent that debris or dusts are not dislodged by winds or physical contact during handling and transportation. The Contractor shall use compressed air for cleaning only if it is accomplished inside a contained area that is equipped with an operating ventilation system capable of capturing the dust and debris.
2. The Contractor shall thoroughly HEPA vacuum, wash, or otherwise decontaminate reusable items until all loose surface dust and debris have been removed. Items requiring cleaning include, but are not limited to, surface preparation and ventilation equipment, containment materials, ground covers, and scaffolding.
3. If adequate cleaning is not possible, the Contractor shall treat the materials as a separate waste stream, and dispose of in accordance with the requirements of this section.

B. Final Cleaning / Clearance Evaluations of Construction Site and Surrounding Property

1. Upon completion of all work, and after all Contractor equipment and materials have been removed, the Contractor shall conduct a thorough inspection of the construction site, and all surrounding property and surfaces located within the likely dispersion zone of dust and debris for the presence of debris. Debris includes, but is not limited to, blast media, materials of construction, fuel, and other litter.
2. The Contractor shall remove all visible debris from the construction site, even if the debris was a pre-existing condition. When cleaning blast debris and dust, the Contractor shall use vacuuming equipment equipped with HEPA filters, wet washing, or other means that will effectively remove the dust and debris without re-dispersing it into the air. The Contractor shall not use compressed air for cleanup activities unless it is used in conjunction with a ventilation system designed to capture the airborne particulate.
3. The Contractor shall collect water used for cleaning and dispose of in accordance with this section.

4. After all clean-up activities are completed, the Contractor shall conduct a final inspection with the Engineer. The Contractor shall conduct any additional cleaning identified by the Engineer. The Contractor shall consider the construction site properly cleaned under the following conditions:
 - a) Spent abrasive and other blast removal media, fuel, materials of construction, litter, or other debris are not visible on or around the construction site.

C. Report on Clearance Inspections

1. The Contractor shall prepare a letter report presenting the results of the inspections conducted to verify the final cleanliness of the construction site, surrounding property, waterways, equipment, buildings, and structures.
2. The Contractor shall include a summary of any problems or releases that occurred during the performance of the work, and the clean-up and corrective action measures that were taken to resolve the problem.

SUB-PART 4 – METHOD OF MEASUREMENT AND BASIS OF PAYMENT

4.1 METHOD OF MEASUREMENT

The work of Worker Protection, Environmental Protection and Waste Handling shall not be measured separately.

4.2 BASIS OF PAYMENT

- A. Payment for “PAINTING STRUCTURE AT STATION 140+75.77” shall include full compensation for furnishing materials, labor, and equipment to perform the work of Worker Protection, Environmental Protection and Waste Handling in accordance with contract documents.

**PART B:
WORKER PROTECTION, ENVIRONMENTAL PROTECTION AND WASTE
HANDLING, APPENDIX A - SUBMITTALS**

AI.01 **GENERAL** - The Contractor shall provide all submittals of this Appendix to the Engineer for review at least 30 days before the start of the work.

A1.02 PRE-CONSTRUCTION

- A. **Qualifications, Experience and Certifications** - The Contractor shall provide written qualification, experience, and certification information for the following:
 1. The Contractor shall submit a list of projects (at least two projects within three years) involving abrasive blasting of bridges, a brief description of each, the date of completion, and the name, address, and telephone number of a contact person representing the Owner.

2. Laboratory for worker monitoring - provide the name, address, telephone number, and contact person of the laboratory that will be used for the worker and regulated area exposure monitoring required under this section.
 3. Laboratory for waste testing - provide the name, address, telephone number, and contact person of the laboratory that will be used for the analysis of air monitoring, blasting and painting waste samples as required by this section. The Contractor shall provide evidence that the analytical laboratory has EPA accreditation for TCLP analysis.
 4. Certified Industrial Hygienist - The Contractor shall provide the name, experience, and qualifications of the CIH who will be reviewing, approving and sealing the site-specific Toxic Metal Health and Safety Compliance Program, and summarizing the employee medical surveillance results.
 5. Transporter/Disposer Qualifications, Experience, and Permits
 - a) The Contractor shall provide the names, addresses, qualifications, permit numbers, and contact person for the proposed transporter(s) of hazardous waste, non-hazardous waste, and wastewater.
 - b) The Contractor shall provide the name, address, telephone number and contact person for each waste disposal facility proposed for use in the Contract, including but not limited to hazardous, non-hazardous, and wastewater. The Contractor shall provide evidence that each disposal facility has current registrations and permits for the operation of such facilities, or written approval from the state (and by the USEPA or other local agency, if applicable) in which it operates.
 - c) The Contractor shall advise each legally permitted recycling or waste disposal facility that bridge paint debris will be generated (e.g., abrasive debris, water), and identify any toxic metals that the waste will likely contain.
 6. The Contractor shall provide the Engineer with the original letters signed by a legally authorized representative of each facility.
- B. Project Plans** - The Contractor shall submit the following plans, programs, and information addressing surface preparation.
1. At least 30 days prior to the commencement of work submit a **Construction Site Sampling and Analysis Plan** for air, wastewater, and waste sampling. Identify the number of samples, the sampling locations, and sampling procedures, and analytical procedures to be used to determine site conditions in and around the project area both before and after bridge surface preparation and painting.

2. At least 30 days prior to the commencement of work submit a Site Work Plan addressing environmental protection and the control of emissions, spill controls, surface preparation methods, waste handling, storage and disposal, and site air monitoring for the area including visual assessment, containment, and personal. The document shall also address the Contractors plan for establishing and monitoring regulated areas around equipment and operations that may generate emissions of dust or blast debris.
3. At least 30 days prior to the commencement of work submit a Site Health and Safety Plan addressing compliance with OSHA 29 CFR 1910 and 1926, The document shall identify the qualifications and responsibilities of the Site Safety Officer as well as training, site controls, and health and safety parameters associated with the hazardous substances that are expected to be encountered as well as worker monitoring and protection.
4. At least 30 days prior to the commencement of work submit a Site Contingency Plan addressing corrective actions that will be taken should an emergency or unforeseen situation arise. Measures should address spillage of blast waste, spillage of bulk paint, spillage of solvents, and oil, river traffic, fires, severe weather, public exposure, worker exposure, site inspections, and material containment.
5. At least 30 days prior to the commencement of work submit a Decontamination Plan to ensure that non-expendable materials and equipment have been properly decontaminated prior to arriving on the project site and before being demobilized from the site. The plan shall address the decontamination methods to be used, decontamination sampling methods, and QC and certification of decontamination.
6. At least 30 days prior to the commencement of work submit a Containment Design Plan and Accumulation Point Layout Plan.
7. Within 30 calendar days following the last day of production blasting furnish analytical data from project sampling of blast waste and an estimate of waste quantities.

C. **Project Health and Safety Compliance** - The Contractor shall submit the following plans, programs, and information addressing worker health and safety from exposure to toxic metals.

1. Verification that any subcontractors working for the Contractor are included in the project meet the health and safety requirements of the requirements of this section. If subcontractors are operating under a separate health and safety program, the Contractor shall include that program(s) with its submittals.
2. Personal Protective Equipment for Engineer's Use - The Contractor shall acknowledge that all protective equipment and clothing, laundering or disposal , fit testing as needed, and hygiene facilities will be provided for up to four Engineer Representatives, if requested.

A1.03 CONSTRUCTION PHASE

- A. **Personnel and Regulated Area Air Monitoring** - The Contractor shall report all employee and regulated area air monitoring exposure results to the Engineer verbally within one day of receipt, and in writing within one week thereafter.
- B. **Visible Emissions and Releases**
 - 1. The Contractor shall maintain and make available for Engineer inspection a log for the documentation of daily inspections and the documentation of unusual incidents or releases.
 - 2. The Contractor shall provide the Engineer with an immediate verbal report each time that work has been halted due to unacceptable visible emissions or releases. The Contractor shall include the cleanup activities invoked, and the corrective action taken to avoid a recurrence. The Contractor shall provide a written report within two (2) days of the incident.
 - 3. The Contractor shall summarize the results of all visible emissions assessments in a monthly report. Bills of Lading - The Contractor shall provide bills of lading for all non-hazardous waste within one (1) week of the date of shipment.
- C. **Project Clean-up** - The Contractor shall Provide the Engineer with a final letter report presenting the results of the inspections conducted to verify the final cleanliness of the construction site, surrounding property, waterways, equipment, buildings, and structures.

REMOVE AND RE-INSTALL FENCE

DESCRIPTION

This work shall consist of removal of the fence on the north side of the bridge in the through truss span (Span 10) to facilitate bridge repairs and superstructure painting; stockpiling the fence during construction; and re-installing the fence when construction activities on the north side of the bridge in Span 10 are completed. The contractor shall stockpile the removed fencing panels on adequate dunnage and shall protect the fence panels and hardware to prevent damage to the protective coating. New nuts and washers shall be used when reinstalling posts to existing embedded anchor bolts and new bolts, nuts and washers shall be used when re-attaching fence panels to fence posts. All attaching hardware shall be finished to match the protective coating on existing hardware. The work shall also include all labor, materials and incidentals required to repair the fencing as shown in the plans at Panel Point L5 of the through truss.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

The removal and re-installation of the fence shall be paid for at the contract unit price per foot for the item "REMOVE AND REINSTALL FENCE." The payment shall be full compensation for all materials, labor, equipment, tools and incidentals to complete the work.

**PORTLAND CEMENT CONCRETE
(J-15-0216)**

Paragraph 1. of Subsection 1002.02 in the Standard Specifications is amended to include the following:

Concrete mixes will be in accordance of Table 1002.02.

Paragraph 3. of Subsection 1002.02 is void and superseded by the following:

3. Type IP, IS and IT Interground/Blended cement shall be used for all classes of concrete except for pavement repair. Type IP, IS and IT Interground/Blended cement shall meet all requirements of ASTM C 595. Pavement repair shall include Type I/II Portland Cement for Class PR1 Concrete and Type III Portland Cement shall be used in Class PR3 Concrete.

Tables 1002.02 and 1002.03 in Subsection 1002.02 are void and superseded by the following:

ENGLISH
TABLE 1002.02

Class of Concrete (1)	Base Cement Type	Total Cementitious Materials Min. lb/cy	Total Aggregate		Air Content % Min.-Max. (2)	Coarse Aggregate (%)	Water/Cement Ratio Max. (3)	Required Strength Min. psi
			Min. lb/cy	Max. lb/cy				
47B**	IP/IS/IT*	564	2850	3150	6.5 - 9.0	-	0.45	3500
47B***		564	2850	3150	6.0 - 8.5	-	0.45	3500
47BD		658	2500	3000	6.0 - 8.5	30+3	0.42	4000
47B-HE		752	2500	3000	6.0 - 8.5	30±3	0.40	3500
BX(4)		564	2850	3150	6.0 - 8.5	-	0.45	3500
47B-OL****		564	2850	3200	5.0 - 7.0	30±3	0.36	4000
PR1	I/II	752	2500	2950	6.0 - 8.5	30±3	0.36	3500
PR3	III	799	2500	2950	6.0 - 8.5	30±3	0.45	3500
SF(5)	I/II	589	2850	3200	6.0 - 8.5	50±3	0.36	4000

- (1) Each class of concrete shall identify the minimum strength requirement, per plans and specifications.
All classes of concrete shall be air-entrained and a water-reducing admixture shall be used per manufacture's recommendations.
- Class R Combined Aggregate shall use a mid-range water reducer admixture. The dosage shall be at the manufacture's recommendation and the Engineer may approve a low-range water reducer admixture.
- (2) As determined by ASTM C 138 or ASTM C 231.
FOR INFORMATION ONLY. The Contractor may develop a Quality Control Program to check the quantity of air content on any given project; such as, checking the air content behind the paver.
- (3) The Contractor is responsible to adjust the water/cement ratio so that the concrete supplied achieves the required compressive strength without exceeding the maximum water/cement ratio. The minimum water/cement ratio for any slip form concrete pavement is 0.38, unless the Contractor requests approval from the Engineer in writing to change the minimum water/cement ratio to 0.36.
- (4) For temporary surfacing, Type I/II cement is allowed.
- (5) Minimum Portland Cement shall be 564 lbs/cyds and the total Silica Fume added shall be 25 lbs/cyds.

(*) Refer to Subsection 1004.02 for material characteristics.

Lithium Nitrate may be used in place of Supplemental Cementitious Materials (SCMs), see Section 1007 of the Standard Specifications as modified in these Special Provisions.

(**) For slip form applications.

(***) For hand-pours and substructures applications.

(****) When IP using Class N pozzolan, the maximum water/cement ratio is 0.41.

Table 1002.03	
Table of Acceptable Concrete Class Substitutions	
Class Specified	Acceptable Class for Substitution
BX	47B, 47BD or 47B-HE
47B	47BD or 47B-HE

Paragraphs 5., 6., 7., 8., 9. and 10. of Subsection 1002.02 are void and superseded by the following:

5. Class PR1 and PR3 Concrete:
 - a. The calcium chloride for use in PR concrete shall be either:
 - (1) A commercially prepared solution with a concentration of approximately 32 percent by weight.
 - (2) A Contractor prepared solution made by dissolving 4.5 pounds of Grade 2 or 6.2 pounds of Grade 1 calcium chloride per gallon of water to provide a solution of approximately 32 percent by weight.
 - b. The 7.4 pounds of water in each gallon of solution shall be considered part of the total water per batch of concrete.
 - c. The calcium chloride solution shall be added, just prior to placement, at a rate of 0.375 gallons/100 pounds of cement (1.4 lb. calcium chloride per 100 lb. cement).
 - d. Class A, Flaked or Pellet Calcium Chloride shall be added at a rate not to exceed 2.0 percent of the weight of the cement for Grade 1, or 1.6 percent of the weight of the cement for Grade 2. Grade 1 Calcium Chloride purity is between 70 and 90 percent and Grade 2 Calcium Chloride is between 91 and 100 percent.
 - e. Where mixing trucks are used:
 - (1) For Class PR3 Concrete, calcium chloride shall be thoroughly mixed into the concrete before placement. The minimum mixing time is 2 minutes.
 - (2) For Class PR1 Concrete, calcium chloride shall be added first and then the concrete mixed at least 2 minutes or as required by manufacturer. Next, the Type F high range water-reducer admixture is added and the concrete is mixed an additional 5 minutes.
6. Class High Early (47B-HE) Concrete
 - a. High Early (47B-HE) concrete shall be cured as prescribed in Subsection 603.03, Paragraph 7. The Contractor shall take necessary curing measures so the required strength is achieved.
 - b. High Early concrete shall achieve a compressive strength of 3,500 psi at 48 hours after placement.

- c. The 48-hour compressive strengths shall be used to determine pay factor deductions for high early concrete in accordance with Table 603.03.
 - d. A non-calcium chloride accelerator shall be used when the ambient temperature at the time of the placement of concrete is 70°F or less.
 - e. When requested by the Contractor, the maturity method, as provided in NDR C 1074, may be used in lieu of the requirements of Subsection 603.03, Paragraphs 11.c. and d. to determine the strength of concrete pavement for the purpose of early opening to traffic and acceptance. Requests by the Contractor for use of the maturity method shall be on a project basis and shall be made in writing to the Engineer.
7. The yield of the concrete proportions shall be determined and adjusted by the Producer.
8. All Classes of Concrete with the exception of PR1 and PR3 shall have a Durability Factor not less than 70 and a mass loss not greater than five percent after 300 freeze/thaw cycles when tested in accordance with ASTM C 666. The freeze/thaw testing shall be conducted according to Procedure A.

Paragraphs 1. & 2. of Subsection 1002.03 are void and superseded by the following:

- 1. The Contractor shall identify the plant that will supply the concrete 14 days before use and be entirely responsible for its calibration, batching of concrete, aggregate and sampling of cement per NDR Sampling Guide.
 - a. The Contractor shall be responsible for the following:
 - 1) Batching concrete.
 - 2) Contractor shall sample aggregate from the conveyor belt or stockpile. Gradations from a split sample shall be tested in accordance to Section 1033 and reported to the Engineer at the frequency required by the Materials Sampling Guide.
 - i. Contractor shall retain possession of the split samples on-site at the Contractor's facility until such a time as determined by the Engineer.
 - a. At the pre-construction meeting:
 - 1) Contractor shall determine the location of testing and report the names of the technician performing the sampling and testing.
 - 2) Engineer will notify the Contractor of the retrieval of the split samples.

- ii. The Contractor shall split the sample, place the Department's split sample into a cloth bag and immediately seal the split sample with the provided security seal. The cloth sample bag shall be supplied by the Department.
 - iii. The sampling splitting and placement of the security seal of aggregate samples shall be witnessed by certified Department personnel.
 - iv. Contractor shall secure the split sample using a consecutively numbered security seal of 75 pounds breaking strength provided by the Department. The Contractor shall use the consecutively numbered security seals to identify and track each Aggregate Class. Samples that are not consecutively numbered will be investigated for custody of the sample and the Engineer may cease production until it is determined what action will be required.
 - a. The Contractor shall report the security seal tracking number with the split sample gradation.
 - b. The following training shall be required for personnel who oversee the batching of the concrete:
 - 1) Concrete Technician Personnel
 - i. Concrete Plant Technician
 - 2) Portland Cement Sampler
 - i. NDR Portland Cement Sampler
2. Portland Cement Concrete shall be supplied by certified Ready Mix Plants that are in compliance with the requirements in the *Quality Control Manual*, Section 3, -- Certification of Ready Mixed Concrete Production Facilities published by the National Ready Mixed Concrete Association. Refer to NDR Material Sampling Guide for the policy on stationary and portable plants.

Paragraph 4. of Subsection 1002.03 is void and superseded by the following:

- 4. a. Mix times shall meet the requirements of ASTM C 94. Mixing time tests shall be repeated whenever the concrete appearance indicates that mixing was inadequate.
- b. Batch plants that are transporting the concrete in non-agitating trucks, the mixing time will not be less than 60 seconds, and for agitating trucks, the mixing time will not be less than 45 seconds.
- c. The Certification of stationary and portable ready mix plants will conform to the tests that are required in the NDR Materials Sampling Guide.

Paragraph 6. of Subsection 1002.03 is void and superseded by the following:

6. Batch tickets shall be prepared as prescribed in the National Ready Mixed Concrete Association's *Quality Control Manual*. The Contractor shall keep all gradations and batch tickets until final acceptance by the Department. Projects that have less than 200 cubic yards of concrete placed will be allowed to have hand written tickets. For projects greater than 200 cubic yards, hand written tickets will be at the Engineer's discretion. The concrete batch tickets shall show batch weights, aggregate moisture (shall be tested daily and moisture probes are allowed), admixtures used, water, and mix design calculations. A copy of the batch ticket shall be given to the Engineer upon delivery of concrete.

Paragraph 8. of Subsection 1002.03 is void and superseded by the following:

8. Coarse aggregate from a dry pit shall be uniformly saturated with water before it is used. The wetting shall begin 24 hours prior to the concrete mixing to allow complete saturation.

Paragraph 13.a. of Subsection 1002.03 is void and superseded by the following:

13. a. The quantity of water shall be determined by the Contractor. The minimum quantity of water should be used which will produce required workability. Any additional water used to rinse the charging hopper and fins after the batching of concrete is allowed. This water must be estimated and recorded on the batch ticket.

Subsection 1002.04 is void and superseded by the following:

1. Class 47B Concrete Mix Design Submittal:
 - a. The Contractor shall submit the Concrete Mix Design Worksheet consisting of design mix proportions, testing of mix design from a minimum of 4 cubic yards and aggregate data for 47B class of concrete being placed on the project.
 - (1) All testing must be performed by a qualified laboratory found on the NDR's Material and Research website, under the *Nebraska Qualified Consultant & LPA Laboratories* and submitted to the Engineer.
 - (2) The Concrete Mix Design shall be submitted to the Engineer 4 weeks prior to any concrete being placed on the project.
 - (3) The Concrete Mix Design shall not be paid for directly by the Department and shall be subsidiary to items which direct payment is made.
 - (4) Concrete shall not be placed on the project before the Concrete Mix Design Worksheet has been reviewed and approved by the Engineer.

b. The Contractor shall submit the Concrete Mix Design Worksheet to the Engineer. Email submissions are preferred but will be accepted by fax or postal mail.

(1) Contractor's Mix Design Worksheet can be found on the Materials and Research website. The submitted Mix Design Worksheet shall include the following:

- Contractor Name
- Project Number
- Date
- Location of ready mix or central mix plant
- Date submitted
- Signature of Contractor representative

(2) Material Source Information.

- Cement Manufacturer
- Type of Interground/Blended Cement
- Type of Admixtures
- Aggregate Pit and Quarry location

(3) Specific Gravity of each individual aggregate source.

(4) Sand Equivalent for dry pit sand-gravel aggregate.

(5) Combined Aggregate percent passing as described on Table 1033.03C.

(6) Contractor's Target combined aggregate gradation percent passing.

(i) The Contractor's required worksheet can be found on the Materials and Research website.

(7) Testing of Mix Design:

The mix design shall show the weights of all ingredients including Interground/Blended cements, aggregates, water, admixtures types and water cement ratio.

- Temperature of concrete at time of sampling, ASTM C 1064.
- The air content of plastic concrete, ASTM C 231.

- Weight per cubic foot, Yield, ASTM C 138. The relative Yield shall be a minimum of 97%.
 - Compressive strength shall be performed with a minimum of three averaged specimens at 7-day and 28-day, ASTM C 39. The minimum 28-day compressive strength shall be 3500 psi.
- (8) Traditional 47B Mix Design is defined as a 70 percent Class B Aggregate and 30 percent Class E Aggregate may be exempt from the concrete testing described in Paragraph 1.(b)(7). All other requirements shall be included in the Concrete Mix Design Report.
- c. The PCC Engineer will notify the Contractor of the mix design approval for Class 47B Concrete. Approval of the mix design does not alleviate the Contractor of the responsibility of the in-place concrete. The Contractor may adjust admixtures, water cement ratio, vibrator frequency, etc., as needed in accordance to the specifications.
- d. The Contractor shall submit a new concrete mix design worksheet meeting the above requirements when a change occurs in the source, type, or proportions of cements or aggregates; unless otherwise approved by the Engineer.
2. The quantity of water to be used shall be determined by the Contractor. It shall not be varied without the Engineer's consent.
3. If the concrete mixture is excessively wet causing segregation, excessive bleeding, excessively dry or any other undesirable condition, the concrete shall be rejected. At the option of the Engineer, slump tests may be performed to determine the consistency.
4. Concrete which has developed initial set before it is consolidated and finished shall be rejected.
5. a. If false set is encountered, the batching operation shall be stopped until the problem is resolved.
- b. Each batch must be mixed or agitated for at least 3 additional minutes after observing the false set and the concrete must be of satisfactory consistency.
6. Compressive strength tests shall be made in accordance with ASTM C 39.
7. Concrete shall be sampled as prescribed in the NDR *Materials Sampling Guide*. Samples shall be taken at the point of placement, never before the discharge from the last conveyance.

8. Aggregate Acceptance, Verification, Sampling and Testing:

- a. The aggregate will be accepted based on the Contractor's testing results except as noted below.
- b. The aggregate verification sampling and testing by the Department will be randomly selected and tested according to subplot sizes in Table 1002.05.

Table 1002.05

Aggregate Class	Lot	Sublot
E and F	3000 tons	1000 tons
A,B and C	6000 tons	2000 tons
R	6000 tons	2000 tons

- c. The results of Contractor split sample will be verified by the Department's verification tests. Any samples outside of the tolerances as specified according to the Materials Sampling Guide, Section 28 under the *Acceptable Tolerance Limits for Independent Assurance* will result in an Independent Assurance (IA) review of testing and may result in the Department test results being applied.
- d. On any given Lot, if the results of the gradation from the verification test are within Department's specification, the Contractor's results will be used for the entire lot. On any given Lot, if the gradations results from the verification test are outside Department's specification, further investigation will be initiated by the Engineer for that subplot. Any or all of the remaining Department subplot samples may be tested and the Department subplot test results may be applied to the respective subplot and the acceptance will apply.
- e. When verification tests are within testing tolerance but results show a consistent pattern of deviation from the split sample results, the Engineer will exercise one or more of the following:
 - Cease production.
 - Request additional verification testing.
 - Initiate a complete IA review.
- f. Independent Assurance (IA) Review of Testing:
 - 1) The Contractor shall allow the Department personnel access to the Contractors' laboratory to conduct IA review of the technician testing procedures and apparatus. Any deficiencies discovered in the Contractor's testing procedures will be reported to the Contractor and corrected by the Contractor.
 - 2) During the IA review, the Department personnel and the Contractor shall split a sample for the purpose of IA testing. The samples selected will be tested in the Department's Branch

Laboratory. Any IA test results found to be outside of defined testing tolerances as stated in Paragraph 8.c. of Subsection 1002.04 will be reported to the Contractor. The Contractor shall immediately correct any deficiencies found during the IA review.

- 3) If the project personnel and the Contractor cannot reach agreement on the accuracy of the test results, the Department Central Laboratory will be asked to resolve the dispute, which will be final. All dispute resolutions will be in accordance with the Quality Assurance Program requirements in the NDR's Materials Sampling Guide.

PORTLAND AND INTERGROUND/BLENDED CEMENT (J-15-0216)

Section 1004 in the Standard Specifications is void and superseded by the following:

1004.01 – Description

1. Portland cement is the binder in concrete, locking the aggregate into a solid structure. It is manufactured from Lime, Silica, and Alumina (with a small amount of plaster of Gypsum).
2. Equivalent alkali referred to herein is hereby defined as the sum of the Sodium Oxide (Na_2O) and the Potassium Oxide (K_2O) calculated as Equivalent Alkali $\text{Na}_2\text{O}_e = \text{Na}_2\text{O} + 0.658 \text{K}_2\text{O}$.
3. Interground and Blended cements consist of intimate and uniform intergrinding or blending of Portland cement clinker, Slag cement, Pozzolan and/or Limestone.

1004.02 – Material Characteristics

1. Type I, Type II, Type I/II and Type III Portland cement shall conform to the requirements in ASTM C 150 with the following additional requirements:
 - a. Portland cement shall not contain more than 0.60 percent equivalent alkali.
2. Interground and Blended Cement shall conform to the requirements in ASTM C 595 with the following additional requirements:
 - a. Interground/Blended cement (Type IP)
 - (1) For Type IP(25) shall be composed of Class F fly ash or Class N pozzolan replacement shall be 25% \pm 2%.
 - (2) For Type IP(20) shall be composed of Class F fly ash or Class N pozzolan replacement shall be 20% + 2%.

- b. Interground/Blended cement (Type IS)
 - (1) For Slag Cement, the maximum replacement shall be 35% +5 when incorporated into the final Interground/Blended cement.
- c. Interground/Blended cement (Type IT)
 - (1) For SCMs, Slag cement and Limestone, the maximum replacement by weight shall be 40%. The manufacturer has a production tolerance of $\pm 2\%$ from the proposed replacement.
 - (2) For Limestone cement, the replacement range shall be from 5.1% to 10.0% when incorporated into the final Interground/Blended cement.
- d. No additional SCMs, Slag cement and Limestone will be added at the batch plant.

1004.03 – Procedures

- 1. The Contractor shall provide adequate protection for the Portland and Interground/Blended cement against dampness.
 - a. Portland and Interground/Blended cement shall be hauled or stored in railroad cars, dry bulk trailers or in suitable moisture-proof buildings.
 - b. The use of tarpaulins for the protection of the Portland and Interground/Blended cement against moisture will not be allowed.
- 2. No Portland and Interground/Blended cement which has become caked or lumpy shall be used.
- 3. Portland and Interground/Blended cement which has been spilled shall not be used.
- 4. Accepted Portland and Interground/Blended cement which has been held in storage at the concrete mix plant more than 90 days shall be retested.
- 5. Portland and Interground/Blended cement coming directly from the manufacturer shall not be used until the temperature is 150°F or less.
- 6. Portland cement having false set when tested in accordance with in ASTM C 150 will not be used.

1004.04 – Acceptance Requirements

- 1. For Department projects, Portland and Interground/Blended cements must be on the NDR Approved Product List (APL).

2. The Contractor shall submit any new Portland and Interground/Blended cements to the Engineer to be approved for the APL with the following:
 - a. Material source information:
 - 1) Mill Location
 - 2) Type of Portland and Interground/Blended cements
 - 3) Grinding Period
 - 4) Associated Manufacture Product Name
 - 5) Provide source and type of each SCMs and/or Slag Cement used for final product.
 - (i) The Department will allow the use of ASTM C 1697.
 - a. When two or more SCMs and/or Slag Cement are pre-blended, the Contractor shall report chemical composition analysis of the final blend.
 - b. The final blend shall be reported as per ASTM C 1697, Paragraph 4.
 - 6) Portland cement shall conform to ASTM C 150.
 - 7) Interground/blended cements shall conform to ASTM C 595.
 - 8) Provide total cementitious materials replacement per ASTM C 595.
 - 9) Report test results per ASTM C 1567 at 28-days.
3. Alkali Silica Reaction Requirements and Testing:
 - a. Interground/Blended cement shall be tested according to the provisions of ASTM C 1567.
 - (1) The mortar bars shall be composed of Type IP, IS or IT Interground/blended cement and sand and gravel from an approved Platte River Valley-Saunders County source.
 - i. When Elkhorn River-Madison County source or an out of state aggregate source is being used on a project, the Elkhorn River or an out of state aggregate source shall be used in lieu of the Platte River Valley-Saunders County source.
 - ii. When Contractor proposes a change of aggregate source, then the new aggregate source shall be tested by ASTM C 1567.
 - (2) The mortar bars for the ASTM C 1567 shall not exceed 0.10% expansion at 28 days.

4. Portland and Interground/Blended cements will be placed on NDR's APL based on the conformance with the NDR's Acceptance Policy Portland and Interground/Blended Cements.

1004.05 - Sampling and Testing Requirements

1. All Portland and Interground/Blended cements shall be sampled and tested at the rate as described in the NDR's Materials Sampling Guide.
 - a. The Department will inform the Contractor when a sample is required.
 - b. A sample shall be taken by a Contractor's Certified Portland Cement Sampler and must be under the supervision of Department certified personnel.
 - c. The sample shall be taken at the plant from a bulk shipment of a rail car, dry bulk trailer, batch plant silo or from the line between the bulk truck and the silo. Upon sampling, the Department will take immediate custody of the sample.
2. Noncompliant material shall be tested in accordance with ASTM C 1567 and in accordance with Section 1004.04, Paragraph 3.a. (1).
 - i. The mortar bars for the ASTM C 1567 shall not exceed 0.10% expansion at 28 days.
 - ii. If the expansion is greater than 0.10% at 28 days, then the Interground/Blended cement shall be subject to removal, 40% pay and/or removal from NDR's APL in accordance with NDR's Acceptance Policy on Portland and Interground/Blended Cements.
3. Noncompliant material from the mill, terminal or project will be temporarily removed from the Approved Products List pending further investigation.
4. If the noncompliant Portland or Interground/Blended cement is removed from the Approval Products List, all shipments from the supplier will be held until the investigation of the failing samples have been completed by the NDR Materials and Research Division.

WATER FOR CONCRETE (J-15-0214)

Section 1005 in the Standard Specifications is void and superseded by the following:

1005.01 – Description

1. Water shall be free from objectionable quantities of oil, acid, alkali, salt, organic matter, or other deleterious materials and shall not be used until the source of supply has been approved.
2. Wash water from the mixer washout may be used only with the Engineer's approval. Use of wash water will be discontinued if undesirable reaction with admixtures or aggregates occurs.

1005.02 – Material Characteristics

1. Water which contains more than 0.25 percent total solids by weight shall not be used.
2. When required by the Engineer, the quality of mixing water shall be determined by NDR C 114, NDR T 290, NDR D 512, NDR C 1602, ASTM C 31, ASTM C 109, ASTM C 191, and ASTM C 1603.
3. Upon written request by the concrete producer and approval by Materials and Research, the concrete producer may utilize up to 10% wash water for batching all classes of concrete with the following conditions:
 - a. Wash water shall conform to the requirements in NDR's Material Sampling Guide under Policy for Certification of Ready Mix Plants.
 - b. Wash water must be clarified wash water that has been passed through a settling pond system.
 - c. Wash water must be scalped off of a settling basin that has been undisturbed for a minimum of 12 hours.
 - d. Wash water must be metered into each load.
 - e. Wash water quantities shall be shown on the batch ticket.

**CALCIUM CHLORIDE
(J-15-0214)**

Section 1006 of the Standard Specifications is void and superseded by the following:

1006.01 – Description

Calcium Chloride shall be Type S (Solid) or Type L (Liquid). Calcium Chloride can be used for; but not limited to, dust control and acceleration of the set of concrete.

1006.02 – Material Characteristics

The requirements for calcium chloride shall be tested in accordance with ASTM D 98.

1006.03 – Acceptance Requirements

Acceptance shall be based on requirements contained in the NDR Materials Sampling Guide.

**SECTION 1007 -- CHEMICAL ADMIXTURES
(J-15-0214)**

Section 1007 in the Standard Specifications is void and superseded by the following:

1007.01 -- Description

1. Admixtures are materials added to Portland cement concrete to change characteristics such as workability, strength, permeability, freezing point, and curing.
2. The Department's concrete admixture types are:
 - a. Type A - Water-Reducing Admixture - An admixture that reduces the quantity of mixing water required to produce concrete of a given slump.
 - b. Type B - Retarding Admixture - An admixture that slows the setting of concrete.
 - c. Type C - Accelerating Admixture - An admixture that speeds the setting and early strength development of concrete.
 - d. Type D - Water-Reducing and Retarding Admixture - An admixture that reduces the quantity of mixing water required to produce concrete of a given slump and slows the setting of concrete.
 - e. Type E - Water-Reducing and Accelerating Admixture - An admixture that reduces the quantity of mixing water required to produce concrete of a given slump and speeds the setting and early strength development of concrete.
 - f. Type F - Water-Reducing, High Range Admixture - An admixture that reduces the quantity of mixing water required to produce concrete of a given slump by 12 percent or greater.
 - g. Type G - Water-Reducing, High Range and Retarding Admixture - An admixture that reduces the quantity of mixing water required to produce concrete of a given slump by 12 percent or greater and slows the setting of concrete.
 - h. Air-Entraining - An admixture that encapsulates air in the concrete.
 - i. Lithium Nitrate – An admixture used to control the Akali Silica Reaction (ASR) in concrete.

1007.02 -- Material Characteristics

1. Type A through G admixtures shall meet the requirements in ASTM C 494.
2. Air-entraining admixtures shall meet the requirements in ASTM C 260.
3. Use of admixtures other than those cited may be requested by the Contractor.
4. Admixtures shall not contain more than 1 percent of chlorides calculated as calcium chloride unless specified otherwise in the Specification.

5. Admixtures shall be used at the manufacturer's recommended dosage rates.
6. The air-entraining admixture characteristics shall produce concrete with satisfactory workability and total air content as prescribed in Table 1002.02.
7. a. When using the Lithium Nitrate admixture, the Contractor shall submit to the Engineer:
 - (i) A five pound sample of Portland cement that will be used on the project.
 - (ii) The Manufacturer's method for determining the recommendation for the required dose rate based on the equivalent alkali content.
 - (iii) Water content of the Lithium Nitrate admixture solution.
- b. The Engineer will report the equivalent alkali content to the Contractor. The Contractor shall use the reported equivalent alkali content to determine the required dose rate based on the manufacturer's recommendation.

1007.03 -- Procedures

1. The process for adding admixtures to a ready mix truck on the project site involves positioning the load of concrete up to the truck chute, stopping short of discharge.
 - a. The admixture is then poured over the surface of the concrete and mixed for at least 5 minutes.
 - b. No more than 1.3 gallons of water shall be used to rinse the admixture from the fins and top chute. This water must be shown on the proportioning report and shall not exceed the water cement ratio.
 - c. When Lithium Nitrate is used, the portion of the admixture that is water will be shown on the proportioning report and shall not exceed the water cement ratio.
 - d. The Contractor is responsible for the addition of the admixture.
2. a. If the air content is less than the minimum specified, addition of air-entraining admixtures is allowed.
- b. The Contractor shall take measures based on manufacturer's recommendations that are within compliance of NDR Specifications, to bring the load of concrete into NDR prescribed limits according to Table 1002.02.
- c. If the air content is then outside the limits in Table 1002.02, the load of concrete shall be rejected.

1007.04 -- Acceptance Requirements

1. a. Approved chemical admixtures are shown on the NDR Approved Products List.
- b. Admixture approval shall be based upon annual certifications and certified test results submitted to the NDR Materials and Research Division.

2. The admixture must be essentially identical in concentration, composition, and performance to the admixture tested for certification.
3. Admixtures not identified on the NDR Approved Products List may be used under the following conditions:
 - a. A certificate of compliance and certified test results must be submitted to the NDR Materials and Research Division and approval for use must be given by the NDR Materials and Research Division.

**SILICA FUME
(J-15-0307)**

Paragraph 2 of Subsection 1009.03 in the Standard Specifications is void and superseded by the following:

2. Silica fume shall be protected from temperatures in excess of 90°F (32°C).

**LIQUID MEMBRANE-FORMING COMPOUNDS FOR CURING CONCRETE
(J-15-0307)**

Subsection 1012.03 in the Standard Specifications is void and superseded by the following:

1012.03 – Acceptance Requirements

1. All curing compounds to be approved must be from the current calendar year with no carry-over from the previous years.
2. Approved compounds are on the NDR Approved Products List.
3. Products not on the NDR Approved Products List shall be sampled and tested in accordance with requirements of the NDR Materials Sampling Guide.

**BITUMINOUS LIQUID COMPOUNDS FOR CURING CONCRETE
(J-15-0515)**

Section 1013 in the Standard Specifications is void and superseded by the following:

1013.01 – Description

The compound shall consist essentially of an asphaltic base and shall be of a consistency suitable for spraying at temperatures existing at the time of construction operations. It shall form a continuous, uniform film. It shall be free of precipitated matter caused by conditions of storage or temperature. The compounds shall be relatively nontoxic.

1013.02 – Material Characteristics

- a. When tested in accordance with AASHTO T 155, the loss of water shall not be more than 0.11 lb/ft² (0.55 kg/m²) of surface area at 3 days, unless otherwise specified by the Engineer.
- b. The Contractor has the option of using bituminous tack coat. The tack coat shall conform to all requirements of Section 504.
- c. The base material shall conform to Sections 1030, 1031 and 1032.

1013.03 – Acceptance Requirements

Products shall be sampled and tested in accordance with requirements of the NDR Materials Sampling Guide.

JOINT AND CRACK SEALING FILLER (J-15-0813)

Section 1014 in the Standard Specifications is void and superseded by the following:

1014.01 – Description

Joint sealing filler shall be either a cold applied silicone product or an asphalt product (hot pour) conforming to the requirements of this Section. The type of joint filler to be used shall be as specified in the plans or special provisions. If not specified, any of the joint sealing fillers in this Section may be used.

Crack sealing filler shall be a hot pour sealer conforming to the requirements of this Section.

1014.02 -- Material Characteristics

1. NE-3405 and NE-3405LM (hot pour)
 - a. NE-3405 joint and crack sealer shall conform to the requirements of ASTM D6690, Type II. The material shall conform to the requirements of Table 1 with the following exception:
 - (i) The test of Bond, non-immersed, ASTM D5329, 3 specimens through 3 cycles shall be run at 0°F (-18°C), 100% extension.
 - b. NE-3405LM (Low Modulus) joint and crack sealer shall conform to the requirements of ASTM D6690, Type IV. The material shall conform to the requirements of Table 1.
 - c. The test of Bond, non-immersed, ASTM-D5329, will be tested on concrete blocks that will be constructed by the NDR Concrete Laboratory. The concrete blocks will be made of a 47B concrete mixture as prescribed in Section 1002 in the NDR Standard Specifications. The design is amended so that no fly ash is used in the mixture. All other specifications for Portland Cement Concrete apply.

- d. Sample conditioning, preparation and heating shall be in accordance with ASTM D 5167 with the following exceptions:
- (i) The following sentence of Section 8.1.2, “Also, if present, remove container liner by cutting it away”, is void and superseded by the following:

“Also, if present, as much of the polyethylene bag as possible, shall be removed by cutting it away. Wholly-meltable type container in contact with the sample section shall be left in place.”
 - (ii) The last sentence of Section 8.1.2 “Solid Materials” is void and superseded by the following:

The entire vertical section which has been cut, shall be placed into the pot for melting.
 - (iii) The Section of 8.2.2.1 “Solid Materials” is void.
 - (iv) The Section of 8.2.3 is void and superseded by the following:

After the solid segment is added to the melter, the material shall be allowed to minimally melt to a uniform viscous state suitable for the installation of the stirrer or paddle. The sample shall then be stirred for one full hour. The oil bath temperature shall be regulated to bring the material to the maximum heating temperature within the one hour of stirring.
 - (v) The Section of 8.2.4.1 is void and superseded by the following:

During the one full hour of stirring, check the temperature of the material at maximum 15 minute intervals using a Type K thermocouple with the calibration verified in accordance with Section 6.1.7 to ensure conformance with specified temperature requirements. Stop the mechanical stirrer when measuring temperatures. If material temperatures ever exceed the maximum heating temperature, or ever drop below the minimum application temperature after the maximum heating temperature was reached, discard the sample and re-do the heating. Maintain appropriate records of times and temperatures to verify conformance with specification requirements.
 - (vi) The Section of 8.2.4.2 is void.
- e. ASTM D 5329 shall include the following changes:
- (i) Sections 6.4 and 12.4 “Specimen Preparation” shall have the reference of “177 ml (6 oz.)” replaced with “3 oz.”

(ii) Section 6 “Cone Penetration, Non-Immersed” shall be superseded with the following exceptions:

1. Section 6.5 “Procedure” is void and superseded by the following:
Place the specimen in a water bath maintained at 77 +/- 0.2°F (25 +/- 0.1°C) for two hours immediately before testing. Remove the specimen from the bath and dry the surface by shaking gently to remove free water from the surface of the specimen. Using the apparatus described in Section 6.3, make one determination at or near the center of the specimen. Take care to ensure the cone point is placed on a point in the specimen that is representative of the material itself, and is free of dust, water, bubbles, or other foreign material.
2. Section 6.6 “Report” is void and superseded by the following:

Record the value as penetration of the specimen in dmm units.

(iii) Section 12 “Resilience” shall be superseded with the following exceptions:

1. Section 12.5 “Procedure”, void the sentence “Make determinations at three points equally spaced from each other and less than 13mm (½ inch) from the container rim” and supersede with the sentence “Make one determination at or near the center of the tin.”
2. Section 12.6 “Report” is void.

2. Silicone Joint Sealer (cold applied)

a. Silicone joint sealers may be either self-leveling or non-sag and shall meet the requirements in Table 1014.01.

Table 1014.01

Silicone Joint Sealer Requirement		
Property	Requirement	Test
As supplied:		
Specific Gravity	1.010-1.515	ASTM D792
Work Time, minimum	10 minutes	
Tack-Free, at 25°C	20-360 minutes	
Cure Time, at 25°C, maximum	14 days	
Full Adhesion, maximum	21 days	
As cured, at 25°C + 1.5		
Elongation, minimum	800%	ASTM D412
Durometer		
Non-Sag, Shore A	10-25	ASTM D2240
Self-Leveling, Shore 00, minimum	40	ASTM D2240
Joint Movement Capacity	+100% to -50%	ASTM C719
Tensile Stress, at 150% Elongation	45 psi	ASTM D412

1014.03 -- Packaging

1. NE-3405 and NE-3405LM
 - a. The joint and crack sealer can be packaged in either cardboard box of wholly-meltable type containers.
 - (i) Cardboard box containers shall be manufactured from double wall kraft board producing a minimum bursting test certification of 350 PSI (241 N/cm²) and using water-resistant adhesives. The use of metal staples or fasteners of any kind will be prohibited for closing the lids of the boxes. Tape or other like material is acceptable.
 - a. The joint and crack sealer shall be in meltable [300°F (149°C)] polyethylene bag(s).
 - (ii) Wholly-meltable type containers, and any of their components, shall be fully meltable and integrational with the joint and crack sealer by the time the manufacturer's minimum application temperature is reached.
 - a. The wholly-melted and integrated container must not adversely affect the test specifications of the joint and crack sealer.
2. Silicone Joint Sealer
 - a. Each container shall include information regarding manufacturer and product name.

1014.04 -- Acceptance Requirements

1. NE-3405 and NE-3405LM
 - a. Acceptance of the manufactured material is based on pre-approval by either on or off-site sampling. Acceptable hot pour sealant lots are listed on the NDR Approved Products List.
 - (i) NDR on-site field sampling shall be in accordance with the NDR Materials Sampling Guide.
 - (ii) Off-site (Proxy) sampling shall be in accordance with ASTM D 6690.
 1. Proxy sampling shall be overseen by an outside party approved by the NDR, preferably another DOT Agency. Proxy samples shall include a manufacturer's Certificate of Compliance. Proxy samples shall also include a dated signature of origin by the Representative that is not affiliated with the manufacturer, and can either be on the Certificate of Compliance, or separate letter.
 2. For convenience in both sampling and shipping samples, sample containers smaller than a manufacturer's usual production containers are allowed, as long as the sample is 1500 grams min.

3. Samples shall be sent to the NDR Bituminous Laboratory, or alternatively, sent to an NDR-approved independent laboratory for testing which will be at no cost to the Department. If a NDR-approved independent laboratory will be used for testing purposes, the NDR Bituminous Laboratory must be notified so that NDR concrete blocks for Bond testing can be sent to it.
2. Silicone Joint Sealer
 - a. Acceptance of applied silicone joint sealers shall be in accordance with the NDR *Materials Sampling Guide*.
 - b. Acceptable silicone joint sealer manufacturer products are listed on the NDR Approved Products List.
 - (i) For products that are not listed, approval may be based upon test results from an independent laboratory submitted to the NDR Concrete Materials Section by the manufacturer, and testing by the NDR. Approval must be made prior to product use.

EPOXY COMPOUNDS AND ADHESIVES (J-15-0308)

Section 1018 in the Standard Specifications is void and superseded by the following:

1018.01 – Description

This specification provides requirements for two-component, epoxy-resin bonding systems for use in non-load bearing applications and resin adhesives for application to Portland cement concrete.

1018.02 – Material Characteristics

1. Epoxy-resin bonding systems shall conform to the requirements of ASTM C 881. Approved systems are shown on the NDR Approved Products List.
2. The classification of Epoxy-Resin Bonding Systems is as follows:
 - a. Type I For use in non-load bearing applications for bonding hardened concrete and other material to hardened concrete.
 - Type II For use in non-load bearing applications for bonding freshly mixed concrete to hardened concrete.
 - Type III For use in bonding skid resistant materials to hardened concrete, and as a binder in epoxy mortars or epoxy concretes.

- b. Grade 1 Low viscosity.
- Grade 2 Medium viscosity.
- Grade 3 Non-sagging consistency.
- c. Class A For use below 40°F (4°C); the lowest allowable temperature to be defined by the manufacturer of the product.
- Class B For use between 40°F and 60°F (4°C and 15°C).
- Class C For use above 60°F (15°C); the highest allowable temperature to be defined by the manufacturer of the product.
- Class D For use between 40°F and 65°F (4°C and 18° C).
- Class E For use between 60°F and 80°F (15°C and 26°C).
- Class F For use between 75°F and 90°F (24°C and 32°C).

1018.03 – Procedures

1. The compounds shall be of the type and grade specified in the plans or as directed by the Engineer.
2. The class of the compounds shall be selected for use according to climatic conditions at the time of application.
3. All bonding surfaces shall be clean and free of all oil, dirt, grease, or any other materials which would prevent bonding.
4. Mixing and application shall be in strict accordance with the manufacturer's instructions.

1018.04 – Acceptance Requirements

1. Epoxy-resin bonding systems and resin adhesives approved for use are shown on the NDR Approved Products List.
2. Epoxy-resin bonding systems that are not on the NDR Approved Products List may be accepted based on a manufacturer's certificate of compliance.

**DEFORMED METAL CENTER JOINT AND METAL KEYWAY
(J-15-0307)**

Paragraph 1 a. of Subsection 1027.01 in the Standard Specifications is void and superseded by the following:

a. Metal Center Joint:

Metal center joint sections shall be manufactured from sheets no less than 18 gauge [0.05 inch (1.3 mm)] thick and shall be of the size and trapezoidal shape shown in the plans. The sections shall be punched along the centerline of the narrow face of the trapezoid to admit the tie bars required by the plans and also at intervals of not greater than 2 feet (600 mm) to receive pins that are driven vertically into the subgrade to support the metal center joint.

**AGGREGATES
(J-15-0616)**

Subsection 1033.01 is amended to include the following paragraphs and Subsection 1033.02, Paragraphs 1., 2. and 3. of the Standard Specifications are void and superseded by the following:

1033.01 – Description

This combined aggregate gradation using Class R aggregate is to optimize aggregate blends utilizing more locally available materials.

Achieving a uniform gradation for Class R may require the use of two or more different aggregates. It is the responsibility of the contractor to consider additional material characteristics; such as, but not limited to particle shape, cubicity, angularity, etc., when designing a mix.

1033.02 -- Material Characteristics**1. Sampling and Testing Procedures:**

All materials shall be sampled and tested in accordance with Table 1033.01. All material source locations and quarries must be approved by the Department for prior to use.

Table 1033.01

Sampling and Testing Procedures	
Procedure	Method
Sampling	NDR T 2
Sieve Analysis	NDR T 27
Clay Lumps, Shale, and Soft Particles	NDR T 504
Abrasion	AASHTO T 96
Freeze and Thaw Soundness	NDR T 103
Specific Gravity and Absorption (course aggregate)	AASHTO T 85
Specific Gravity and Absorption (fine aggregate)	AASHTO T 84
Total Evaporable Moisture Content of Aggregates by Drying	AASHTO T 255
Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test	AASHTO T 176
Sodium Sulfate Soundness	AASHTO T 104
Calcium Carbonate	NDR C 25
Organic Impurities	AASHTO T 21
Mortar-Making Properties	AASHTO T 71
Reducing Field Samples of Aggregate to Testing Size	AASHTO T 248
Lightweight Pieces in Aggregates	NDR T 113

2. General Aggregate Properties:

- a. Aggregates shall be free from injurious quantities of dust, soft or flaky particles, loams, alkali, organic matter, paper, wood or other deleterious matter as determined by the Engineer.
- b. Dolomite as herein defined is a magnesium limestone containing calcium carbonate and magnesium carbonate in approximately a 4 to 3 ratio.
- c. The calcium carbonate content of limestone shall be at least 80 percent (computed as CaCO_3 from the value determined for CaO).
- d. Fine Sand shall have at least 95 percent of its particles pass the No. 10 (2.0 mm) sieve and no more than 25 percent pass the No. 200 (75 μm) sieve. This definition applies to sodium sulfate soundness test.
- e. Once an aggregate's soundness and abrasion quality has been determined, additional quality testing for soundness and abrasion loss will be at the Engineer's discretion.
- f. All aggregates or combine aggregates that have been washed or coming from a wet pit shall be stockpiled for a minimum of 48 hours before being introduced into concrete.

3. Portland Cement Concrete Aggregates:

a. Fine Aggregate:

- (1) Aggregate shall be washed and composed of clean, hard, durable and uncoated particles.
- (2) Aggregates produced from wet pits by pumping must be adequately washed by means approved by the Department.
- (3) Aggregates from dry pits shall be adequately washed by means approved by the Department and have a Sand Equivalent value not less than 90 in accordance with AASTHO T 176.
 - (i) If the Sand Equivalent is less than 90, the Engineer may elect to stop aggregate production until such a time ASTM C 109 has been completed. The aggregate, when subjected to the test for mortar-making properties, shall produce a mortar having a compressive strength at the age of 7 days equal to or greater than that developed by mortar of the same proportions and consistency made of the same cement and aggregate after the aggregate has been washed to a sand equivalent greater than 90. Materials failing to produce equal or greater strength shall be unacceptable.
- (4) Aggregate for concrete shall have a soundness loss of not more than 10% by weight at the end of 5 cycles using Sodium Sulfate Soundness test AASHTO T 104.
- (5) The weight of the aggregate shall not contain more than 0.5% clay lumps.
- (6) Aggregate subjected to the colorimetric test for organic impurities which produces a color darker than the standard shall be further tested for its mortar-making properties in accordance with AASHTO T 71. The Engineer may elect to stop aggregate production until such a time AASHTO T 71 testing has been completed.
 - (i) Aggregate, when subjected to the test for mortar-making properties, shall produce a mortar having a compressive strength at the age of 7 days equal to or greater than that developed by mortar of the same proportions and consistency made of the same cement and aggregate after the aggregate has been treated in a 3% solution of sodium hydroxide. Materials failing to produce equal or greater strength shall be unacceptable, except when determined to be acceptable under the provisions of Subsection 105.03.

- (7) Aggregate shall meet the requirement in Tables 1033.02A, 1033.02B and 1033.03C.
- (8) Lightweight pieces (measured by percent by volume values) shall not exceed 3.5%. For Class R aggregate, fine aggregate is defined as any material passing a No. 4 sieve.

Table 1033.02A

		Percentage	Percent Passing									
			1 1/2"	1"	3/4"	1/2"	3/8"	No.4	No.10	No.20	No.30	No.200
AGGREGATE SPECIFICATION RANGE	Class A	Max	--	--	--	--	100	100	90	--	40	3
		Min	--	--	--	--	100	92	64	--	10	0
	Class B	Max	--	100	--	--	--	97	70	--	40	3
		Min	--	100	--	--	--	77	50	--	16	0
	Class C	Max	--	100	--	--	--	88	50	--	20	3
		Min	--	100	--	--	--	44	24	--	4	0

Table 1033.02B

Aggregate Classes and Uses	
Aggregate Class	Concrete Description
A	Overlay Concrete SF
B	47BD, 47B-HE, 47B-OL, PR 1 and PR 3
C	BX

b. Coarse Aggregate:

- (1) Aggregate shall consist of Limestone, Quartzite, Dolomite, Gravel and Granite composed of clean, hard, durable, and uncoated particles.
- (2) The percent of clay lumps, shale, soft particles or lightweight pieces shall not exceed the following amounts:

Clay Lumps	0.5%
Shale	1.0%
Soft Particles	3.5%
Lightweight Pieces	3.5%

- (3) Any combination of clay lumps, shale and soft particles (all percent by weight values), plus the lightweight pieces (a percent by volume value) shall not exceed 3.5%. For Class R aggregate, coarse aggregate is defined as any materials retained on a No. 4 sieve.
- (4) Aggregate for concrete shall be free of coatings that will inhibit bond and free of injurious quantities of loam, alkali, organic matter, thin or laminated pieces, chert, or other deleterious substances as determined by the Engineer.
- (5) Aggregate for concrete shall not have a soundness loss greater than 8.0% by weight at the completion of 16 cycles of alternate freezing and thawing.
- (6) Aggregates for concrete shall have a Los Angeles Abrasion loss percentage of not more than 40.

- (7) All fractions passing the No.4 sieve shall meet quality requirement of soundness loss of not more than 10% by weight at the end of 5 cycles using sodium sulfate solution.
- (8) The coarse aggregate shall be tested according to ASTM C 1260.
 - (a) The mortar bars for the ASTM C 1260 shall not exceed 0.10% expansion at 28 days.
 - (i) If the proposed coarse aggregate exceeds 0.10% expansion at 28 days, the aggregate proportions used on the project shall be tested in accordance to ASTM C 1567.
 - a. The ASTM C 1567 mortar bars shall be composed of Interground/blended cement being used on the project.
 - b. If the expansion is greater than 0.10%, the coarse aggregate shall not be used.
- (9) Aggregate shall meet the requirements in Tables 1033.03A, B, and C.

Table 1033.03A

AGGREGATE SPECIFICATION RANGE	Class	Percent	Percent Passing									
			1 1/2"	1"	3/4"	1/2"	3/8"	No.4	No.10	No.20	No.30	No.200
			Max	100	100	90	--	45	12	--	*4	--
Min	100	92	66	--	15	0	--	0	--	0		
Class F	Max	--	--	100	100	90	30	8	--	--	3	
	Min	--	--	100	96	40	4	0	--	--	0	

*If the No. 200 sieve is less than 1.5% passing the No.20 sieve could be increased to maximum of 6% passing.

Table 1033.03B

Aggregate Classes and Uses	
Aggregate Class	Concrete Description
E	47BD, 47B-HE, PR 1 and PR 3
F	47B-OL, Overlay Concrete SF

c. Combined Aggregates:

- (1) The Contractor shall design and meet the specification requirements. It is the Contractor's responsibility to provide desirable mix properties; such as, but not limited to, workability, resistance to segregation, stable air void system, good finishing properties and good consolidation properties.
- (2) The combined blended aggregate shall meet the requirement in Table 1033.03C and 1033.03D.

Table 1033.03C

*Class R - Combined Aggregate Gradation Limits (Percent Passing)								
Sieve Size	1 1/2 inch	1 inch	3/4 inch	No.4	No.10	No.30	No. 50	No.200
Max	100	100	98.0	70.0	50.0	30.0	12.0	3.0
Min	-	92.0	85.0	45.0	31.0	8.0	2.0	0

* Refer to Subsection 1002.04, Paragraph 1.b.(8) for the traditional 47B Mix Design

Table 1033.03D

Aggregate Classes and Uses	
Aggregate Class	Concrete Description
R	47B

d. Aggregate Production and Testing:

- (1) Any change greater than 3% in the original verified constituent percentage of the combined aggregates gradation will be considered non-compliant. Any change of the combined gradation targets must remain within the Combined Aggregate Gradation Limits in Table 1033.03C. The Contractor shall resubmit a new mix design if the material is deemed non-compliant in accordance with Subsection 1002.04, Paragraph 1.
- (2) The blended gradation tolerance ranges from the approved mix design are established in Table 1033.03E.
 - (i) The Contractor shall assume the responsibility to cease operations when the specifications are not met. Production shall not be started again without the approval of the Engineer.

Table 1033.03E Blended Aggregate Production Tolerances

Sieve Size	Tolerances
No. 4 or greater	± 5%
No. 10 to No. 30	± 4%
No. 50	± 3%
Minus No. 200	± 1%

- (3) Coarse aggregate from a dry pit shall be uniformly saturated with water before it is used. The wetting shall begin 24 hours before concrete mixing to allow complete saturation.

**DOWEL BARS
(J-15-0812)**

Paragraph 1.c. of Subsection 1022.01 in the Standard Specifications is void and superseded by the following:

1. c. Both Type A and Type B coated dowel bars shall be coated with a bond breaker shown on the NDR Approved Products List, dipped in asphalt or paraffin, or greased in accordance with the specified requirements as shown in the Standard Plans.

**EPOXY COATED REINFORCING STEEL
(J-15-0509)**

Paragraph 5. of Subsection 1021.03 in the Standard Specifications is void and superseded by the following:

5. In order to protect the coated reinforcement from damage, the Contractor shall use padded or nonmetallic slings and padded straps. Bundled bars shall be handled in a manner which will prevent excessive sagging of bars which will damage the coating. If circumstances require storing coated steel reinforcing bars outdoors for more than two months, protective storage measures shall be implemented to protect the material from sunlight, salt spray and weather exposure. Coated steel reinforcing bars, whether individual bars or bundles of bars, or both, shall be covered with opaque polyethylene sheeting or other suitable opaque protective material. For stacked bundles, the protective covering shall be draped around the perimeter of the stack. The covering shall be secured adequately, and allow for air circulation around the bars to minimize condensation under the covering. Coated steel reinforcing bars, whether individual bars or bundles of bars, or both, shall be stored off the ground on protective cribbing. The bundled bars shall not be dropped or dragged. If, in the opinion of the Engineer, the coated bars have been extensively damaged, the material will be rejected. The Contractor may propose, for the approval of the Engineer, alternate precautionary measures.

**PROPOSAL GUARANTY
(A-40-0307)**

As an evidence of good faith in submitting a bid for this work, the bidder shall indicate the type of bid bond applied to this project in accordance with the Proposal Guaranty Bid Bond Section of these Special Provisions.

* * * * *

200INFSEP16

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CONTRACT ID: 2631X

PROJECT(S): STR-275-7(1045)

CALL ORDER NO.: 200

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

SECTION 1 GROUP 6 BRIDGE AT STATION 140+75.77 MULTIPLE SPAN RIVER BRIDGE REPAIR AND OVERLAY

0001	0001.08	BARRICADE, TYPE II	5880.000 BDAY	0.50000		2,940.00
0002	0001.10	BARRICADE, TYPE III	3220.000 BDAY	.		.
0003	0001.90	SIGN DAY	6468.000 EACH	.		.
0004	0001.99	CONTRACTOR FURNISHED SIGN DAY	350.000 EACH	.		.
0005	0002.18	4" WHITE REMOVABLE WET REFLECTIVE TAPE, TYPE 4	11250.000 LF	.		.
0006	0002.19	4" YELLOW REMOVABLE WET REFLECTIVE TAPE, TYPE 4	10000.000 LF	.		.
0007	0002.28	TEMPORARY PAVEMENT MARKING REMOVAL	500.000 LF	.		.
0008	0002.30	PAVEMENT MARKING REMOVAL	500.000 LF	.		.
0009	0002.44	TEMPORARY PAVEMENT MARKING, TYPE PAINT	500.000 LF	.		.
0010	0002.47	TEMPORARY PAVEMENT MARKING SURFACE PREPARATION	500.000 LF	.		.
0011	0002.97	FLASHING ARROW PANEL	280.000 DAY	.		.
0012	0010.04	FIELD OFFICE	1.000 EACH	.		.
0013	0030.60	MOBILIZATION	LUMP	LUMP		.
0014	6016.20	MULTI-LAYER EPOXY POLYMER OVERLAY	41365.000 SY	.		.
0015	6020.27	DRILL DRAIN HOLE	262.000 EACH	.		.

CONTRACT ID: 2631X

PROJECT(S): STR-275-7(1045)

CALL ORDER NO.: 200

LINE NO	ITEM DESCRIPTION		APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
				DOLLARS	CTS	DOLLARS	CTS
0016	6030.00	PREPARATION OF BRIDGE AT STATION 140+75.77	1.000 EACH	.		.	
0017	6052.72	INSPECTION ACCESS SYSTEM	LUMP	LUMP		.	
0018	6131.23	PENETRATING CONCRETE SEALER	107629.000 SF	.		.	
0019	6406.27	REMOVE AND REINSTALL FENCE	635.000 LF	.		.	
0020	6415.30	DRAINAGE TROUGH	176.000 SY	.		.	
0021	6430.00	PAINTING STRUCTURE AT STATION 140+75.77	LUMP	LUMP		.	
0022	6617.25	CONCRETE REPAIR	10.000 SF	.		.	
0023	6618.27	SEAL EXPOSED GIRDER END	68.000 EACH	.		.	
0024	6801.28	CRACK EPOXY INJECTION	347.000 LF	.		.	
0025	7515.37	5" WHITE WET REFLECTIVE POLYUREA PAVEMENT MARKING	12500.000 LF	.		.	
0026	7515.39	12" WHITE WET REFLECTIVE POLYUREA PAVEMENT MARKING	1250.000 LF	.		.	
0027	7520.06	ARROW, PERMANENT PAVEMENT MARKING	4.000 EACH	.		.	
0028	L860.50	ENVIRONMENTAL COMMITMENTS - CONTRACTOR COMPLIANCE	LUMP	LUMP		.	
	SECTION 1 TOTAL					.	
TOTAL BID						.	