

PROJECT SPECIAL PROVISIONS

Project No.: 17BP.12.P.5 Catawba, Cleveland, Gaston, Iredell, and Lincoln Counties

SCOPE OF WORK

This work shall consist of furnishing all labor, equipment, and materials to repair structural steel, clean and paint the structural steel, replace expansion joints, replace elastomeric bearing pads and repair or replace bearings for existing bridges, as specified in plans. Contractor shall provide all necessary access; underdeck platforms, scaffolding, ladders, etc.; provide all traffic control; provide all staging areas, material storage, waste disposal, provide environmental controls to limit loss of materials in water and air; painting equipment, jacking equipment, sawing equipment, and chipping equipment; and all else necessary to complete the work. No separate payment will be made for portable lighting as the cost of such is incidental to the work being performed.

The contractor shall be responsible for fulfilling all requirements of the NCDOT Standard Specifications for Roads and Structures dated January 2012, except as otherwise specified herein.

SECURING OF VESSELS

(12-5-12)

Secure vessels in accordance with Section 107 of the Standard Specifications and the following provision.

When utilizing barges, tugboats or other vessels, take all necessary precautions to ensure that such vessels are securely anchored or moored when not in active operation. Take all necessary measures to ensure that the vessels are operated in a manner that avoids damage to or unnecessary contact with bridges and other highway structures and attachments. If severe weather conditions are anticipated, or should be anticipated through reasonable monitoring of weather forecasts, take additional measures to protect bridges and other highway structures and attachments from extreme conditions. The Contractor is strictly liable for damages to any bridge or other highway structure or attachment caused by a vessel owned or controlled by the Contractor. The Contractor is also liable to third parties for property damages and loss of revenue caused by vessels under the Contractor's control.

WORK IN, OVER, OR ADJACENT TO NAVIGABLE WATERS

(12-5-12)

All work in, over, or adjacent to navigable waters shall be in accordance with the special provisions and conditions contained in the permits obtained by the Department from the U.S. Coast Guard, U.S. Army Corps of Engineers, or other authority having jurisdiction. The work shall have no adverse effect on navigation of the waterway including traffic flow, navigational

depths, and horizontal and vertical clearances without approval from the authorities granting the permits.

The Contractor shall prepare drawings necessary to obtain any permits which may be required for his operations which are not included in the Department's permit including but not limited to excavation and dumping, constructing wharves, piers, ramps, and other structures connecting to bank or shore, and drawings for constructing falsework, cofferdams, sheeting, temporary bridges, and any other construction within the waterway. Submittals shall show locations of such work with respect to the navigational opening. The Contractor shall coordinate the submittal of drawings with the Engineer.

All construction shall progress and be maintained in a safe and timely manner. Temporary construction facilities shall be removed completely and promptly upon discontinuation of their useful purpose. Navigational lights, signals, or facilities shall be provided and maintained by the Contractor on temporary or permanent construction or vessels until such facilities are no longer needed as determined by the Engineer or permitting agency.

The Contractor shall immediately notify the appropriate authorities and take corrective measures as needed when any situation occurs that imposes a threat to the public. He shall also immediately correct any acts or occurrences that contradict or violate any requirements in the plans, special provisions, or permits when corrective measures can be performed in a safe manner. The Contractor shall notify the appropriate authorities when such corrective measures cannot be performed in a safe manner.

All costs incurred by the Contractor in complying with the above requirements shall be included in the prices bid for the various pay items and no additional payment will be made.

SUBMITTAL OF WORKING DRAWINGS

SPECIAL

General

Submit working drawings in accordance with Article 105-2 of the *Standard Specifications* and this provision. For this provision, "submittals" refers to only those listed in this provision. The list of submittals contained herein does not represent a complete list of required submittals for the project. Submittals are only necessary for those items as required by the contract. **Make submittals that are not specifically noted in this provision directly to the Resident Engineer.**

To minimize review time, make sure all submittals are complete when initially submitted. The first submittal may be made via email. Provide a contact name and information with each submittal. Direct any questions regarding submittal requirements to the Resident Engineer or Structures Management Unit.

Addresses and Contacts

Mr. Rick Nelson, PE Assistant State Structures Engineer – Operations NC Dept. of Transportation Structures Management Unit	Mr. Aaron Dacey Coatings & Corrosion Engineer NC Dept. of Transportation Materials & Tests Unit 1563 Mail Service Center
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1000 Birch Ridge Drive Raleigh, NC 27610 Fax: 919.250-4082 Ph: 919.707-6530 Email: enelson@ncdot.gov	Raleigh, NC 27699-1563 Fax: 919.733.8742 Ph: 919.329.4090 Email: adacey@ncdot.gov
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Furnish one complete copy of each submittal, including all attachments, to the Resident Engineer. At the same time, submit the number of copies shown below of the same complete submittal directly to the Structures Management Unit and the Materials & Tests Unit.

The table below covers “Submittals”. The Resident Engineer will receive review comments and drawing markups for these submittals from the State Bridge Management Unit.

Unless otherwise required, submit one set of supporting calculations to the State Bridge Management Unit. Provide additional copies of any submittal as directed by the Engineer.

SUBMITTALS

Submittal	Copies Required by SMU	Copies Required by Materials & Tests	Contract Reference Requiring Submittal
Bridge Painting Submittals (Under Structure Platforms, Containment, Product Data, Health & Safety, QC Plan, etc.)	1 via email, Then 5 hard copies	1 via email	Special Provision
Falsework & Forms (superstructure)	8	0	Article 420-3 & “Falsework and Formwork”
Adhesively Anchored Anchor Bolts or Dowels	8	0	Article 420-13
Structural Steel	2, then 7	0	Article 1072-8
Jacking Plan	1 via email, Then 1 hard copy		Special Provisions
Expansion Joint Seals (modular)	2, then 9	0	“Modular Expansion Joint Seals”

FALSEWORK AND FORMWORK

(4-5-12)

1.0 DESCRIPTION

Use this Special Provision as a guide to develop temporary works submittals required by the Standard Specifications or other provisions; no additional submittals are required herein. Such temporary works include, but are not limited to, falsework and formwork.

Falsework is any temporary construction used to support the permanent structure until it becomes self-supporting. Formwork is the temporary structure or mold used to retain plastic or fluid concrete in its designated shape until it hardens. Access scaffolding is a

temporary structure that functions as a work platform that supports construction personnel, materials, and tools, but is not intended to support the structure. Scaffolding systems that are used to temporarily support permanent structures (as opposed to functioning as work platforms) are considered to be falsework under the definitions given. Shoring is a component of falsework such as horizontal, vertical, or inclined support members. Where the term “temporary works” is used, it includes all of the temporary facilities used in bridge construction that do not become part of the permanent structure.

Design and construct safe and adequate temporary works that will support all loads imposed and provide the necessary rigidity to achieve the lines and grades shown on the plans in the final structure.

2.0 MATERIALS

Select materials suitable for temporary works; however, select materials that also ensure the safety and quality required by the design assumptions. The Engineer has authority to reject material on the basis of its condition, inappropriate use, safety, or nonconformance with the plans. Clearly identify allowable loads or stresses for all materials or manufactured devices on the plans. Revise the plan and notify the Engineer if any change to materials or material strengths is required.

3.0 DESIGN REQUIREMENTS

A. Working Drawings

Provide working drawings for items as specified in the contract, or as required by the Engineer, with design calculations and supporting data in sufficient detail to permit a structural and safety review of the proposed design of the temporary work.

On the drawings, show all information necessary to allow the design of any component to be checked independently as determined by the Engineer.

When concrete placement is involved, include data such as the drawings of proposed sequence, rate of placement, direction of placement, and location of all construction joints. Submit the number of copies as called for by the contract.

When required, have the drawings and calculations prepared under the guidance of, and sealed by, a North Carolina Registered Professional Engineer who is knowledgeable in temporary works design.

If requested by the Engineer, submit with the working drawings manufacturer’s catalog data listing the weight of all construction equipment that will be supported on the temporary work. Show anticipated total settlements and/or deflections of falsework and forms on the working drawings. Include falsework footing settlements, joint take-up, and deflection of beams or girders.

As an option for the Contractor, overhang falsework hangers may be uniformly spaced, at a maximum of 36 inches, provided the following conditions are met:

Member Type (PCG)	Member Depth, (inches)	Max. Overhang Width, (inches)	Max. Slab Edge Thickness, (inches)	Max. Screenshot Wheel Weight, (lbs.)	Bracket Min. Vertical Leg Extension, (inches)
II	36	39	14	2000	26
III	45	42	14	2000	35
IV	54	45	14	2000	44
MBT	63	51	12	2000	50
MBT	72	55	12	1700	48

Overhang width is measured from the centerline of the girder to the edge of the deck slab.

For Type II, III & IV prestressed concrete girders (PCG), 45-degree cast-in-place half hangers and rods must have a minimum safe working load of 6,000 lbs.

For MBT prestressed concrete girders, 45-degree angle holes for falsework hanger rods shall be cast through the girder top flange and located, measuring along the top of the member, 1'-2 1/2" from the edge of the top flange. Hanger hardware and rods must have a minimum safe working load of 6,000 lbs.

The overhang bracket provided for the diagonal leg shall have a minimum safe working load of 3,750 lbs. The vertical leg of the bracket shall extend to the point that the heel bears on the girder bottom flange, no closer than 4 inches from the bottom of the member. However, for 72-inch members, the heel of the bracket shall bear on the web, near the bottom flange transition.

Provide adequate overhang falsework and determine the appropriate adjustments for deck geometry, equipment, casting procedures and casting conditions.

If the optional overhang falsework spacing is used, indicate this on the falsework submittal and advise the girder producer of the proposed details. Failure to notify the Engineer of hanger type and hanger spacing on prestressed concrete girder casting drawings may delay the approval of those drawings.

Falsework hangers that support concentrated loads and are installed at the edge of thin top flange concrete girders (such as bulb tee girders) shall be spaced so as not to exceed 75% of the manufacturer's stated safe working load. Use of dual leg hangers (such as Meadow Burke HF-42 and HF-43) are not allowed on concrete girders with thin top flanges. Design the falsework and forms supporting deck slabs and overhangs on girder bridges so that there will be no differential settlement between the girders and the deck forms during placement of deck concrete.

When staged construction of the bridge deck is required, detail falsework and forms for screed and fluid concrete loads to be independent of any previous deck pour components when the mid-span girder deflection due to deck weight is greater than 3/4".

Note on the working drawings any anchorages, connectors, inserts, steel sleeves or other such devices used as part of the falsework or formwork that remains in the permanent structure. If the plan notes indicate that the structure contains the necessary corrosion protection required for a Corrosive Site, epoxy coat, galvanize or metalize these devices. Electroplating will not be allowed. Any coating required by the Engineer will be considered incidental to the various pay items requiring temporary works.

Design falsework and formwork requiring submittals in accordance with the 1995 AASHTO *Guide Design Specifications for Bridge Temporary Works* except as noted herein.

1. Wind Loads

Table 2.2 of Article 2.2.5.1 is modified to include wind velocities up to 110 mph. In addition, Table 2.2A is included to provide the maximum wind speeds by county in North Carolina.

Table 2.2 - Wind Pressure Values

Height Zone feet above ground	Pressure, lb/ft ² for Indicated Wind Velocity, mph				
	70	80	90	100	110
0 to 30	15	20	25	30	35
30 to 50	20	25	30	35	40
50 to 100	25	30	35	40	45
over 100	30	35	40	45	50

2. Time of Removal

The following requirements replace those of Article 3.4.8.2.

Do not remove forms until the concrete has attained strengths required in Article 420-16 of the Standard Specifications and these Special Provisions.

Do not remove forms until the concrete has sufficient strength to prevent damage to the surface.

Table 2.2A - Steady State Maximum Wind Speeds by Counties in North Carolina

COUNTY	25 YR (mph)	COUNTY	25 YR (mph)	COUNTY	25 YR (mph)
Alamance	70	Franklin	70	Pamlico	100
Alexander	70	Gaston	70	Pasquotank	100
Alleghany	70	Gates	90	Pender	100
Anson	70	Graham	80	Perquimans	100
Ashe	70	Granville	70	Person	70
Avery	70	Greene	80	Pitt	90
Beaufort	100	Guilford	70	Polk	80
Bertie	90	Halifax	80	Randolph	70
Bladen	90	Harnett	70	Richmond	70
Brunswick	100	Haywood	80	Robeson	80
Buncombe	80	Henderson	80	Rockingham	70
Burke	70	Hertford	90	Rowan	70
Cabarrus	70	Hoke	70	Rutherford	70
Caldwell	70	Hyde	110	Sampson	90
Camden	100	Iredell	70	Scotland	70
Carteret	110	Jackson	80	Stanley	70
Caswell	70	Johnston	80	Stokes	70
Catawba	70	Jones	100	Surry	70
Cherokee	80	Lee	70	Swain	80
Chatham	70	Lenoir	90	Transylvania	80
Chowan	90	Lincoln	70	Tyrell	100
Clay	80	Macon	80	Union	70
Cleveland	70	Madison	80	Vance	70
Columbus	90	Martin	90	Wake	70
Craven	100	McDowell	70	Warren	70
Cumberland	80	Mecklenburg	70	Washington	100
Currituck	100	Mitchell	70	Watauga	70
Dare	110	Montgomery	70	Wayne	80
Davidson	70	Moore	70	Wilkes	70
Davie	70	Nash	80	Wilson	80
Duplin	90	New Hanover	100	Yadkin	70
Durham	70	Northampton	80	Yancey	70
Edgecombe	80	Onslow	100		
Forsyth	70	Orange	70		

B. Review and Approval

The Engineer is responsible for the review and approval of temporary works' drawings.

Submit the working drawings sufficiently in advance of proposed use to allow for their review, revision (if needed), and approval without delay to the work.

The time period for review of the working drawings does not begin until complete drawings and design calculations, when required, are received by the Engineer.

Do not start construction of any temporary work for which working drawings are required until the drawings have been approved. Such approval does not relieve the Contractor of the responsibility for the accuracy and adequacy of the working drawings.

4.0 CONSTRUCTION REQUIREMENTS

All requirements of Section 420 of the Standard Specifications apply.

Construct temporary works in conformance with the approved working drawings. Ensure that the quality of materials and workmanship employed is consistent with that assumed in the design of the temporary works. Do not weld falsework members to any portion of the permanent structure unless approved. Show any welding to the permanent structure on the approved construction drawings.

Provide tell-tales attached to the forms and extending to the ground, or other means, for accurate measurement of falsework settlement. Make sure that the anticipated compressive settlement and/or deflection of falsework does not exceed 1 inch. For cast-in-place concrete structures, make sure that the calculated deflection of falsework flexural members does not exceed 1/240 of their span regardless of whether or not the deflection is compensated by camber strips.

A. Maintenance and Inspection

Inspect and maintain the temporary work in an acceptable condition throughout the period of its use. Certify that the manufactured devices have been maintained in a condition to allow them to safely carry their rated loads. Clearly mark each piece so that its capacity can be readily determined at the job site.

Perform an in-depth inspection of an applicable portion(s) of the temporary works, in the presence of the Engineer, not more than 24 hours prior to the beginning of each concrete placement. Inspect other temporary works at least once a month to ensure that they are functioning properly. Have a North Carolina Registered Professional Engineer inspect the cofferdams, shoring, sheathing, support of excavation structures, and support systems for load tests prior to loading.

B. Foundations

Determine the safe bearing capacity of the foundation material on which the supports for temporary works rest. If required by the Engineer, conduct load tests to verify proposed bearing capacity values that are marginal or in other high-risk situations.

The use of the foundation support values shown on the contract plans of the permanent structure is permitted if the foundations are on the same level and on the same soil as those of the permanent structure.

Allow for adequate site drainage or soil protection to prevent soil saturation and washout of the soil supporting the temporary works supports.

If piles are used, the estimation of capacities and later confirmation during construction using standard procedures based on the driving characteristics of the pile is permitted. If preferred, use load tests to confirm the estimated capacities; or, if required by the Engineer conduct load tests to verify bearing capacity values that are marginal or in other high risk situations.

The Engineer reviews and approves the proposed pile and soil bearing capacities.

5.0 REMOVAL

Unless otherwise permitted, remove and keep all temporary works upon completion of the work. Do not disturb or otherwise damage the finished work.

Remove temporary works in conformance with the contract documents. Remove them in such a manner as to permit the structure to uniformly and gradually take the stresses due to its own weight.

6.0 METHOD OF MEASUREMENT

Unless otherwise specified, temporary works will not be directly measured.

7.0 BASIS OF PAYMENT

Payment at the contract unit prices for the various pay items requiring temporary works will be full compensation for the above falsework and formwork.

CRANE SAFETY

(8-15-05)

Comply with the manufacturer specifications and limitations applicable to the operation of any and all cranes and derricks. Prime contractors, sub-contractors, and fully operated rental companies shall comply with the current Occupational Safety and Health Administration regulations (OSHA).

Submit all items listed below to the Engineer prior to beginning crane operations involving critical lifts. A critical lift is defined as any lift that exceeds 75 percent of the manufacturer's

crane chart capacity for the radius at which the load will be lifted or requires the use of more than one crane. Changes in personnel or equipment must be reported to the Engineer and all applicable items listed below must be updated and submitted prior to continuing with crane operations.

CRANE SAFETY SUBMITTAL LIST

- A. **Competent Person:** Provide the name and qualifications of the “Competent Person” responsible for crane safety and lifting operations. The named competent person will have the responsibility and authority to stop any work activity due to safety concerns.
- B. **Riggers:** Provide the qualifications and experience of the persons responsible for rigging operations. Qualifications and experience should include, but not be limited to, weight calculations, center of gravity determinations, selection and inspection of sling and rigging equipment, and safe rigging practices.
- C. **Crane Inspections:** Inspection records for all cranes shall be current and readily accessible for review upon request.
- D. **Certifications:** By July 1, 2006, crane operators performing critical lifts shall be certified by NC CCO (National Commission for the Certification of Crane Operators), or satisfactorily complete the Carolinas AGC’s Professional Crane Operator’s Proficiency Program. Other approved nationally accredited programs will be considered upon request. All crane operators shall also have a current CDL medical card. Submit a list of anticipated critical lifts and corresponding crane operator(s). Include current certification for the type of crane operated (small hydraulic, large hydraulic, small lattice, large lattice) and medical evaluations for each operator.

GROUT FOR STRUCTURES

9-30-11

1.0 DESCRIPTION

This special provision addresses grout for use in pile blockouts, grout pockets, shear keys, dowel holes and recesses for structures. This provision does not apply to grout placed in post-tensioning ducts for bridge beams, girders, or decks. Mix and place grout in accordance with the manufacturer’s recommendations, the applicable sections of the Standard Specifications and this provision.

2.0 MATERIAL REQUIREMENTS

Use a Department approved pre-packaged, non-shrink, non-metallic grout. Contact the Materials and Tests Unit for a list of approved pre-packaged grouts and consult the manufacturer to determine if the pre-packaged grout selected is suitable for the required application.

When using an approved pre-packaged grout, a grout mix design submittal is not required.

The grout shall be free of soluble chlorides and contain less than one percent soluble sulfate. Supply water in compliance with Article 1024-4 of the Standard Specifications.

Aggregate may be added to the mix only where recommended or permitted by the manufacturer and Engineer. The quantity and gradation of the aggregate shall be in accordance with the manufacturer's recommendations.

Admixtures, if approved by the Department, shall be used in accordance with the manufacturer's recommendations. The manufacture date shall be clearly stamped on each container. Admixtures with an expired shelf life shall not be used.

The Engineer reserves the right to reject material based on unsatisfactory performance.

Initial setting time shall not be less than 10 minutes when tested in accordance with ASTM C266.

Test the expansion and shrinkage of the grout in accordance with ASTM C1090. The grout shall expand no more than 0.2% and shall exhibit no shrinkage. Furnish a Type 4 material certification showing results of tests conducted to determine the properties listed in the Standard Specifications and to assure the material is non-shrink.

Unless required elsewhere in the contract the compressive strength at 3 days shall be at least 5000 psi. Compressive strength in the laboratory shall be determined in accordance with ASTM C109 except the test mix shall contain only water and the dry manufactured material. Compressive strength in the field will be determined by molding and testing 4" x 8" cylinders in accordance with AASHTO T22. Construction loading and traffic loading shall not be allowed until the 3 day compressive strength is achieved.

When tested in accordance with ASTM C666, Procedure A, the durability factor of the grout shall not be less than 80.

3.0 SAMPLING AND PLACEMENT

Place and maintain components in final position until grout placement is complete and accepted. Concrete surfaces to receive grout shall be free of defective concrete, laitance, oil, grease and other foreign matter. Saturate concrete surfaces with clean water and remove excess water prior to placing grout.

Do not place grout if the grout temperature is less than 50°F or more than 90°F or if the air temperature measured at the location of the grouting operation in the shade away from artificial heat is below 45°F.

Provide grout at a rate that permits proper handling, placing and finishing in accordance with the manufacturer's recommendations unless directed otherwise by the Engineer. Use grout free of any lumps and undispersed cement. Agitate grout continuously before placement.

Control grout delivery so the interval between placing batches in the same component does not exceed 20 minutes.

The Engineer will determine the locations to sample grout and the number and type of samples collected for field and laboratory testing. The compressive strength of the grout will be considered the average compressive strength test results of 3 cube or 2 cylinder specimens at 28 days.

4.0 BASIS OF PAYMENT

No separate payment will be made for “Grout for Structures”. The cost of the material, equipment, labor, placement, and any incidentals necessary to complete the work shall be considered incidental to the structure item requiring grout.

PAINTING EXISTING STRUCTURE

(12-5-12)

DESCRIPTION

This work shall consist of furnishing all labor, equipment, and materials necessary to clean and paint the structural steel of the existing bridge. Work includes: removal, containment and disposal of the existing paint system; preparation of the surface to be painted and applying the new paint system; a containment enclosure; and any incidentals necessary to complete the project as specified and shown on the plans.

CERTIFICATION

The existing paint systems include toxic substances such as red lead oxide, which are considered hazardous if improperly removed. The contractor shall be currently SSPC QP 2, Category A certified, and have successfully completed lead paint removal and field painting on similar structures within 18 months prior to this bid.

The apparent low bidder shall submit a list of projects for which QP 2 work was performed within the last 18 months including owner contact information and submit to the Assistant State Structures Engineer (Operations) a “Lead Abatement Affidavit” by 12:00 noon of the third day following the opening of bids. This form may be downloaded from: <http://www.ncdot.gov/projects/ncbridges/#stats>.

The Engineer will evaluate the work history to verify all lead abatement work was completed in accordance with contract specifications, free of citation from safety or environmental agencies. Lead abatement work shall include, but not be limited to: abrasive blasting; waste handling, storage and disposal; worker safety during lead abatement activities (fall protection, PPE, etc.); and containment. This requirement is in addition to the contractor pre-qualification requirements covered by Article 102-2 of the *2012 Standard Specifications*.

TWELVE-MONTH OBSERVATION PERIOD

The Contractor maintains responsibility for the coating system for a 12 month observation period beginning upon the satisfactory completion of all the work required in the plans or as directed by the Engineer. The Contractor shall guarantee the coating system under the payment and performance bond (refer to Article 109-10 of the *2012 Standard Specifications*). To successfully complete the observation period, the coating system shall meet the following requirements after 12 months service:

- (A) No visible rust, contamination or application defect is observed in any coated area.
- (B) Painted surfaces have a uniform color and gloss.
- (C) Painted surfaces have an adhesion that meets an ASTM D3359, 3A rating.

Final acceptance is made only after the paint system meets the above requirements.

SUBMITTALS

Submit all of the following to the Engineer for review and approval before scheduling the pre-construction meeting. Allow at least 2 weeks for the review process.

- (A) Work schedule which shall be kept up to date, with a copy of the revised schedule being provided to the Engineer in a timely manner,
- (B) Containment Drawings in accordance with SSPC Guide 6, Class 2A sealed by a Professional Engineer licensed by the State of North Carolina,
- (C) Bridge wash water sampling and disposal plan,
- (D) Subcontractor identification,
- (E) Lighting plan for night work in accordance with Section 1413 of the *2012 Standard Specifications*,
- (F) Traffic control plan with NCDOT certified supervisors, flaggers and traffic control devices,
- (G) Health and safety plan addressing at least the required topics as specified by the SSPC QP 1 and QP 2 program and including hazard communication, respiratory health, emergency procedures, and local hospital and treatment facilities with directions and phone numbers, disciplinary criteria for workers who violate the plan and accident investigation. The plan shall address the following: hazardous materials, personal protective equipment, general health and safety, occupational health and environmental controls, fire protection and prevention, signs signals, and barricades, materials handling, storage, use, and disposal, hand and power tools, welding and cutting, electrical, scaffolds, fall protection, cranes, derricks, hoists, elevators, and conveyors, ladders, toxic and hazardous substances, airless injection and HPWJ.
- (H) Provide the Engineer a letter of certification that all employees performing work on the project have blood lead levels that are below the OSHA action level.
- (I) Provide the Engineer with Competent Person qualifications and summary of work experience.
- (J) Environmental Compliance Plan

- (K) Quality Control Plan (Project Specific) with quality control qualifications and summary of work experience.
- (L) Bridge and Public Protection Plan (Overspray, Utilities, etc. - Project/Task Specific)
- (M) Abrasive Blast Media
 - (1) Product Data Sheet
 - (2) Blast Media Test Reports in accordance with Article 1080-13 of the *2012 Standard Specification*.
- (N) Coating Material
 - (1) NCDOT HICAMS Test Reports (testing performed by NCDOT Materials and Tests Unit),
 - (2) Product Data Sheets,
 - (3) Material Safety Data Sheets,
 - (4) Product Specific Repair Procedures, and
 - (5) Acceptance letters from paint manufacturer's for work practices that conflict with Project Special Provisions and/or paint manufactures product data sheets.

PRE-CONSTRUCTION MEETING

Submittals shall be reviewed and approved by the Engineer prior to scheduling the pre-construction meeting. Allow no less than 2 weeks for a review process. When requesting a pre-construction meeting, contact the Engineer at least 7 working days in advance of the desired pre-construction date. The contractor's project supervisor, Competent person, quality control personnel and certified traffic control supervisor shall be in attendance at the pre-construction meeting in order for the Contractor and NCDOT team to establish responsibilities for various personnel during project duration and to establish realistic timeframes for problem escalation.

CONTAINMENT PLAN

No work begins until the Contractor furnishes the Engineer with a containment plan for surface preparation and coating operations and the Engineer reviews and approves, in writing, the acceptability of said plan. Allow a minimum of two weeks for review of the plan. Such plan shall meet or exceed the requirements of Class 2A containment in accordance with SSPC Guide 6. Enclosure drawings and loads supported by the structure shall be prepared, signed and sealed by a Professional Engineer licensed by the State of North Carolina.

In the containment plan describe how debris is contained and collected. Describe the type of tarpaulin, bracing materials and the maximum designed wind load. Describe the dust collection system and how a negative pressure of 0.03 inches of water column is maintained inside the enclosure while blasting operations are being conducted. Describe how the airflow inside the containment structure is designed to meet all applicable OSHA Standards. Describe how water run-off from rain will be routed by or through the enclosure. Describe how wash water will be contained and paint chips separated. Describe what physical containment will be provided during painting application to protect the public and areas not to be painted.

WASH WATER SAMPLING AND DISPOSAL PLAN

No work begins until the Contractor furnishes the Engineer with a containment plan for surface preparation and coating operations and the Engineer reviews and approves in writing said plan. All wash water shall be collected and sampled prior to disposal. Representative sampling and testing methodology shall conform to 15A NCAC 02B.0103, “Analytical Procedures”. Wash water shall be tested for pollutants listed in 15A NCAC 02B.0211(3), 15A NCAC 02T.0505(b)(1) and 15A NCAC 2T.0905(h). Depending on the test results, wash water disposal methods shall be described in the disposal plan. Wash water shall be disposed of in accordance with all current Federal and State regulations. See link for NCDOT Guidelines for Managing Bridge Wash Water: <http://www.ncdot.gov/projects/nbridges/#stats>.

WASTE HANDLING OF PAINT AND ABRASIVES

Comply with all Federal, State and local regulations. Failure to comply with the regulations could result in fines and loss of qualified status with NCDOT.

Comply with the Resource Conservation and Recovery Act (RCRA - 40 CFR 261 - 265) and the Occupational Safety and Health Act (OSHA - 29 CFR 1910 - 1926) regulations for employee training, and for the handling, storage, labeling, recordkeeping, reporting, inspections and disposal of all hazardous waste generated during paint removal.

A summary of Generator Requirements is available at the above NCDOT web link which cites the specific regulations for each Generator category. Quantities of waste by weight and dates of waste generation shall be recorded. Waste stored at the project site shall be properly labeled. All waste, hazardous or non-hazardous, requires numbered shipping manifests.

The North Carolina Department of Environment and Natural Resources (NCDENR) have adopted RCRA as the North Carolina Hazardous Waste Management Rules and are responsible for enforcement. The “Hazardous Waste Compliance Manual for Generators of Hazardous Waste” is published by the Compliance Branch of the Division of Waste Management of NCDENR, and can be found at: <http://portal.ncdenr.org/web/wm/hw/rules>.

Use a company from the below list of approved waste management companies. Immediately after award of the contract, arrange for waste containers, sampling, testing, transportation and disposal of all waste. No work shall begin until the Contractor furnishes the Engineer with a written waste disposal plan. Any alternative method for handling waste shall be pre-approved by the Engineer.

Southern Logistics, Inc. – 312 Orville Wright Dr., Greensboro, NC 27409
(Ph. 336-662-0292)

A&D Environmental – PO Box 484, High Point, NC 27261
(Ph. 336-434-7750)

Poseidon Environmental Services, Inc. – 837 Boardman-Canfield Rd #209, Youngstown, OH

(Ph. 330-726-1560)

Clean Harbors Reidsville, LLC – 208 Watlington Industrial Drive, Reidsville, NC 27320

(Ph. 336-342-6106)

All removed paint and spent abrasive media shall be tested for lead following the SW-846 TCLP Method 1311 Extraction, as required in 40 CFR 261, Appendix 11, to determine whether it shall be disposed of as hazardous waste. Furnish the Engineer certified test reports showing TCLP results and Iron analysis of the paint chips stored on site, with disposal in accordance with “Flowchart on Lead Waste Identification and Disposal” at:

http://portal.ncdenr.org/c/document_library/get_file?p_l_id=38491&folderId=328599&name=DLFE-9855.pdf

All sampling shall be done in presence of the Engineer’s representative.

The Competent Person shall obtain composite samples from each barrel of the wash water and waste generated by collecting two or more portions taken at regularly spaced intervals during accumulation. Composite the portions into one sample for testing purposes. Acquire samples after 10% or before 90% of the barrel has accumulated. The intent is to provide samples that are representative of widely separated portions, but not the beginning and end of wash water or waste accumulation.

Perform sampling by passing a receptacle completely through the discharge stream or by completely diverting the discharge into a sample container. If discharge of the wash water or waste is too rapid to divert the complete discharge stream, discharge into a container or transportation unit sufficiently large to accommodate the flow and then accomplish the sampling in the same manner as described above.

Comply with the NCDENR Hazardous Waste Compliance Manual for Generators of Hazardous Waste. Record quantities of waste by weight and dates of waste generation. Until test results are received, store all waste, and label as “NCDOT Bridge Paint Removal Waste - Pending Analysis” and include the date generated and contact information for the Division HazMat Manager or Project Engineer. Store waste containers in an enclosed, sealed and secured storage container protected from traffic from all directions. Obtain approval for the protection plan for these containers from the Engineer. If adequate protection cannot be obtained by use of existing guardrail, provide the necessary supplies and equipment to maintain adequate protection. Once test results are received and characterized, label waste as either “Hazardous Waste - Pending Disposal” or “Paint Waste - Pending Disposal”.

Once the waste has been collected, and the quantities determined, prepare the appropriate shipping documents and manifests and present them to the Engineer. The Engineer will verify the type and quantity of waste and obtain a Provisional EPA ID number from the:

NC Hazardous Waste Section
North Carolina Department of Environment & Natural Resources
1646 Mail Service Center
Raleigh, NC 27699
Phone (919) 508-8400, Fax (919) 715-4061

At the time of shipping, the Engineer will sign, date and add the ID number in the appropriate section on the manifest. The maximum on-site storage time for collected waste shall be 90 days. All waste whether hazardous or non-hazardous will require numbered shipping manifests. The cost for waste disposal (including lab and Provisional EPA ID number) is included in the bid price for this contract. Note NC Hazardous Waste Management Rules (15A NCAC 13A) for more information. Provisional EPA ID numbers may be obtained at this link:

<http://portal.ncdenr.org/web/wm/provisional-hw-notification-page>.

Testing labs shall be certified in accordance with North Carolina State Laboratory Public Health Environmental Sciences. List of certified laboratories may be obtained at this link:

<http://slphreporting.ncpublichealth.com/EnvironmentalSciences/Certification/CertifiedLaboratory.asp>.

All test results shall be documented on the lab analysis as follows:

1. For leachable lead:
 - a. Soils/Solid/Liquid- EPA 1311/200.7/6010

Area sampling will be performed for the first 2 days at each bridge location. The area sample will be located within five feet of the containment and where the highest probability of leakage will occur (access door, etc.). Results from the area sampling will be given to the Engineer within 72 hours of sampling (excluding weekends). If the results of the samples exceed $20 \mu\text{g}/\text{m}^3$ corrective measures shall be taken and monitoring shall be continued until 2 consecutive sample results are less than $20 \mu\text{g}/\text{m}^3$.

TWA may suspend the work if there are visible emissions outside the containment enclosure or pump monitoring results exceeding the level of $30 \mu\text{g}/\text{m}^3$.

Where schools, housing and/or buildings are within 500 feet of the containment, the Contractor shall perform initial TSP-Lead monitoring for the first 10 days of the project during abrasive blasting, vacuuming and containment removal. Additional monitoring will be required during abrasive blasting 2 days per month thereafter. Results of the TSP monitoring at any location shall not exceed $1.5 \mu\text{g}/\text{m}^3$.

EQUIPMENT MOBILIZATION

The equipment used in any travel lanes and paved shoulder shall be mobile equipment on wheels that has the ability to move on/off the roadway in less than 30 minutes. All work conducted in travel lanes shall be from truck or trailer supported platforms and all equipment shall be self-propelled or attached to a tow vehicle at all times.

QUALITY CONTROL INSPECTOR

Provide a quality control inspector in accordance with the SSPC QP guidelines to ensure that all processes, preparation, blasting and coating application are in accordance with the requirements of the contract. The inspector shall have written authority to perform QC duties to include continuous improvement of all QC internal procedures. The presence of the engineer or inspector at the work site shall in no way lessen the contractor's responsibility for conformity with the contract.

QUALITY ASSURANCE INSPECTOR

The quality assurance inspector which may be a Department employee or a designated representative of the Department shall observe, document, assess and report that the Contractor is complying with all of the requirements of the contract. Inspectors employed by the Department are authorized to inspect all work performed and materials furnished. Such inspection may extend to all or any part of the work and to the preparation, fabrication or manufacture of the materials to be used. The inspector is not authorized to alter or waive the requirements of the contract. Each stage in preparing the structure to be coated which includes but not limited to washing, blasting, coating testing and inspection shall be inspected and approved by the Engineer or his authorized representative.

SUBLETTING OF CONTRACT

Only contractors certified to meet SSPC QP 2, Category A, and have successfully completed lead paint removal and field painting on all similar structures within 18 months prior to this bid are qualified for this work. Work is only sublet by approval of the Engineer.

PREPARATION OF SURFACES

Before any other surface preparation is conducted, all surfaces shall be power washed to remove dust, salts, dirt and other contaminants. All wash water shall be contained, collected and tested in accordance with the requirements of NCDOT Managing Bridge Wash Water specification. Obtain approval of the Engineer and allow all cleaned surfaces to dry to the touch and without standing water before beginning surface preparation or painting activities.

Surface preparation is done with materials meeting Article 1080-13 of the *2012 Standard Specifications*. No silica sand or other silica materials are permitted for use. The profile

shall be between 1.0 and 3.0 mils when measured on a smooth steel surface. Conduct and document at least 2 tests per beam/girder and 2 tests per span of diaphragms/cross bracing.

Spread tarpaulins over all pavements and surfaces underneath equipment used for abrasive blasting as well as equipment and containers used to collect abrasive media. This requirement will be enforced during activity and inactivity of equipment.

Before the Contractor departs from the work site at the end of the work day, collect all debris generated during surface preparation and all dust collector hoses, tarps or other appurtenances containing blasting residue in approved containers.

Clean a 3" x 3" area at each structure to demonstrate the specified finish, and the inspector will preserve this area by covering it with tape, plastic or some other suitable means so that it can be retained as the Dry Film Thickness (DFT) gauge adjustment standard. An acceptable alternative is for the Contractor to provide a steel plate with similar properties and geometry as the substrate to be measured.

The contractor and or quality assurance representative shall notify the Engineer of any area of corroded steel which has lost more than 50% of its original thickness.

All parts of the bridges not to be painted and the travelling public shall be protected from overspray. Submit a plan to protect all parts of bridge that are not required to be painted and a plan to protect the traveling public and surrounding environment while applying all coats of paint to a structure.

Ensure that chloride levels on the surfaces are $7 \mu\text{g}/\text{cm}^2$ or lower using an acceptable sample method in accordance with SSPC Guide 15. The frequency of testing shall be 2 tests per span after all surface preparation has been completed and immediately prior to painting. Select test areas representing the greatest amount of corrosion in the span as determined by the Engineers' representative. Additional testing may be required if significant amounts of chloride are detected.

All weld splatter, slag or other surface defects resulting in a raised surface above the final paint layer shall be removed prior to application of primer coat.

PAINTING OF STEEL

Paint System 1, as specified in these special provisions and Section 442 of the *2012 Standard Specifications*, is to be used for this work. System 1 is an inorganic zinc primer, two coats acrylic paint and one stripe coat of acrylic paint over blast cleaned surfaces in accordance with SSPC-SP-10 (Near White Blast). Perform all mixing operations over an impervious surface with provisions to prevent runoff to grade of any spilled material. The contractor is responsible for reporting quantities of thinner purchased as well the amounts used. No container with thinner shall be left uncovered, when not in use.

Apply 2" stripe coat, by brush or roller only, to all exposed edges of steel including fasteners before applying the finish coat. Locate the edge or corner in the approximate center of the paint stripe.

Any area where newly applied paint fails to meet the specifications shall be repaired or replaced by the Contractor. The Engineer approves all repair processes before the repair is made. Repaired areas shall meet the specifications. The Contractor applies an additional finish coat of paint to areas where the tape adhesion test is conducted.

MATERIALS

Only paint suppliers that have a NCDOT qualified inorganic zinc primer may furnish paints for this project. All paints applied to a structure shall be from the same supplier. Before any paints are applied the Contractor shall provide the Engineer a manufacturer's certification that each batch of paint meets the requirements of the applicable Section 1080 of the *2012 Standard Specifications*.

The inspector randomly collects a one pint sample of each paint product used on the project. Additional samples may be collected as needed to verify compliance to the specifications.

Do not expose paint materials to rain, excessive condensation, long periods of direct sunlight, or temperatures above 110°F or below 40°F. In addition, the Contractor shall place a device which records the high, low and current temperatures inside the storage location. Follow the manufacturer's storage requirements if more restrictive than the above requirements.

INSPECTION

Surface Preparation for System 1 shall be in accordance with SSPC SP-10. Any area(s) not meeting the requirements of SSPC SP-10 shall be remediated prior to application of coating. Surface inspection is considered ready for inspection when all blast abrasive, residue and dust is removed from surfaces to be coated.

(A) Quality Assurance Inspection

The Contractor furnishes all necessary OSHA approved apparatus such as ladders, scaffolds and platforms as required for the inspector to have reasonable and safe access to all parts of the work. The contractor illuminates the surfaces to be inspected to a minimum of 50-foot candles of light. All access points shall be illuminated to a minimum of 20-foot candles of light.

NCDOT reserves the right for ongoing QA (Quality Assurance) inspection to include but not limited to surface contamination testing, adhesion pull testing and DFT readings as necessary to assure quality.

Inform the Engineer and the Division Safety Engineer of all scheduled and unannounced inspections from SSPC, OSHA, EPA and/or others that come on site. Furnish the Engineer a copy of all inspection reports except for reports performed by a third party and or consultant on behalf of the Contractor.

(B) Inspection Instruments

At a minimum, furnish the following calibrated instruments and conduct the following quality control tests:

- (1) Sling Psychrometer - ASTM E337 - bulb type
- (2) Surface Temperature Thermometer
- (3) Wind Speed Indicator
- (4) Tape Profile Tester - ASTM D4417 Method C
- (5) Surface Condition Standards - SSPC VIS-1 and VIS-3
- (6) Wet Film Thickness Gage - ASTM D4414
- (7) Dry Film Thickness Gage - SSPC-PA2 Modified
- (8) Solvent Rub Test Kit - ASTM D4752
- (9) Adhesion Test Kit - ASTM D3359 Method A (Tape Test)
- (10) Adhesion Pull test - ASTM D4541
- (11) Surface Contamination Analysis Kit or (Chloride Level Test Kit)
SSPC Technology Guide 15

(C) Quality Control

Maintain a daily quality control record in accordance with Article 442-13 of the *2012 Standard Specifications* and make such records available at the job site for review by the inspector and submit to the Engineer as directed. In addition to the information required on M&T-610, submit all Dry Film Thickness (DFT) readings on a form equivalent to M&T-611.

- (1) Measure DFT at each spot on the attached diagram and at the required number of locations as specified below:
 - (a) For span members less than 45 feet; three random locations along each girder in each span.
 - (b) For span members greater than 45 feet; add one additional location for each additional 10 feet in span length.

DFT measurements for the prime coat shall not be taken for record until the zinc primer has cured in accordance with ASTM D4752 (MEK Rub Test) with no less than a four resistance rating.

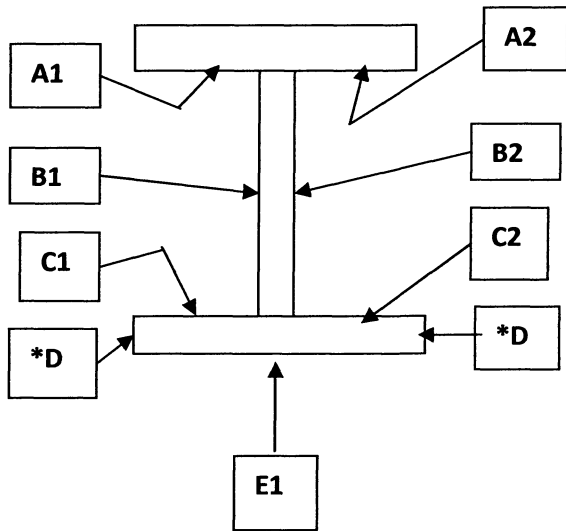
Stiffeners and other attachments to beams and or plate girders shall be measured at no less than five random spots per span. Also dry film

thickness is measured at no less than six random spots per span on diaphragms/"K" frames.

Each spot is an average of three to five individual gage readings as defined in SSPC PA-2. No spot average shall be less than 80% of minimum DFT for each layer applied; this does not apply to stripe coat application. Spot readings that are non-conforming shall be re-accessed by performing additional spot measurements not to exceed one foot intervals on both sides of the low areas until acceptable spot averages are obtained. These non-conforming areas shall be corrected by the Contractor prior to applying successive coats.

Less than 36" in height and/or bottom flanges less than 16" in width.

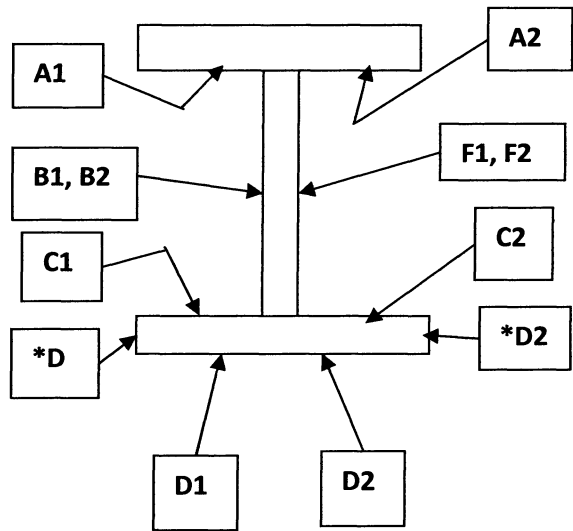
7 Spot Areas
21 Individual DFT Readings



***D areas are only included when flange thickness is one inch (1") or greater.**

36" in height or greater and/or bottom flanges greater than 16" in width.

10 Spot Areas
30 Individual DFT Readings



***D areas are only included when flange thickness is one inch (1") or greater.**

- (2) Two random adhesion tests (1 test=3 dollies) per span are conducted on interior surfaces in accordance with ASTM D4541 (Adhesion Pull Test) after the prime coat has been properly cured in accordance with ASTM D4752 (MEK Rub Test) with no less than a 4 resistance rating, and will be touched up by the Contractor. The required minimum average adhesion is 400 psi.
- (3) Cure of the intermediate and stripe coats shall be accessed by using the thumb test in accordance with ASTM D1640 (Curing Formation Test) prior to the application of any successive layers of paint.
- (4) One random Cut Tape adhesion test per span is conducted in accordance with ASTM D3359 (X-Cut Tape Test) on interior surface after the finish coat is cured. Repair areas shall be properly tapered and touched up by the Contractor.

SAFETY AND ENVIRONMENTAL COMPLIANCE PLANS

Personnel access boundaries are delineated for each work site using signs, tape, cones or other approved means. Submit copies of safety and environmental compliance plans that comply with SSPC QP 2 Certification requirements.

HEALTH AND SAFETY RESPONSIBILITIES

This project may involve toxic metals such as arsenic, lead, cadmium and hexavalent chromium. It is the contractor's responsibility to test for toxic metals and if found, comply with the OSHA regulations, which may include medical testing.

Ensure a "Competent Person" as defined in OSHA 29 CFR 1926.62; one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them; is on site during all surface preparation activities and monitors the effectiveness of containment, dust collection systems and waste sampling. Before any work begins, provide a written summary of the Competent Person's safety training.

Comply with Subarticle 442-14(B) of the *2012 Standard Specifications*.

Comply with Subarticle 442-14(D) of the *2012 Standard Specifications*. Ensure employee blood sampling test results are less than 50 micrograms per deciliter. Remove employees with a blood sampling test of 50 or more micrograms per deciliter from work activities involving any lead exposure.

An employee who has been removed with a blood level of 50 micrograms per deciliter or more shall have two consecutive blood sampling tests spaced one week apart indicating that the employee's blood lead level is at or below 40 micrograms per deciliter before returning to work activities involving any lead exposure.

All OSHA recordable accidents that occur during the project duration are to be reported to the Engineer within twenty-four (24) hours of occurrence. In addition, for accidents that involve civilians or property damage that occurs within the work zone the Division Safety Engineer shall be notified immediately.

Prior to blasting operations, the Contractor shall have an operational OSHA approved hand wash station at each bridge location and a decontamination trailer at each bridge or between bridges unless the work is on the roadway, or the Contractor shall show reason why it is not feasible to do so and provide an alternative site as approved by the Engineer. The Contractor shall assure that all employees whose airborne exposure to lead is above the PEL shall shower at the end of their work shift.

STORAGE OF PAINT AND EQUIPMENT

Provide a location for materials, equipment and waste storage. Spread tarpaulins over all pavements and surfaces underneath equipment used for abrasive recycling and other waste handling equipment or containers. All land and or lease agreements that involve private property shall disclose to the property owner that heavy metals may be present on the Contractor's equipment. Prior to storing the Contractor's equipment on private property, provide a notarized written consent signed by the land owner received by the Engineer at least forty-eight (48) hours before using property. All storage of paint, solvents and other materials applied to structures shall be stored in accordance with Section 442 of the *2012 Standard Specifications* or the manufacturers' requirements. The more restrictive requirements will apply.

UTILITIES

Protect all utility lines or mains which may be supported on, under, or adjacent to bridge work sites from damage and paint overspray.

MEASUREMENT AND PAYMENT

The cost of inspection, surface preparation and repainting the existing structure is included in the lump sum price bid for *Painting Existing Structure*. This price is full compensation for furnishing all inspection equipment, all paint, cleaning abrasives, cleaning solvents and all other materials; preparing and cleaning surfaces to be painted; applying paint in the field; protecting work area, traffic and property; and furnishing blast cleaning equipment, paint spraying equipment, brushes, rollers, any other hand or power tools and any other equipment; and a containment enclosure.

Pollution Control will be paid at the contract lump sum price which will be full compensation for all collection, handling, storage, air monitoring, and disposal of debris and wash water, all personal protective equipment, and all personal hygiene requirements, and all equipment, material and labor necessary for the daily collection of the blast debris

into specified containers; and any measures necessary to ensure conformance to all safety and environmental regulations as directed by the Engineer.

Payment will be made under:

Pay Item	Pay Unit
Painting Existing Structure Bridge # ____	Lump Sum
Pollution Control Bridge # ____	Lump Sum

DESCRIPTION OF BRIDGES

Bridge #19: This bridge was built in 1947 and is located on NC 16 BUS. over US 70 in Catawba County, NC. The bridge has an overall length of 127'-3" and consists of 3 simple spans with 10 lines of 21W82 steel girders and diaphragm. The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is

7,408 sq. ft.

Bridge #20: This bridge was built in 1969 and is located on NC 10 over the South Fork of the Catawba River near Newton in Catawba County, NC. The bridge has an overall length of 280'-0" and consists of 5 total spans with 4- 52'-6" foot long spans with a 70'-0" long center span with 5 lines of 36W135 steel girders with diaphragms. The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is

13,862 sq. ft.

Bridge #91: This bridge was built in 1968 as is located on NC 127 over Lake Hickory on the Catawba Co. and Alexander Co. line near Hickory in Catawba County, NC. The bridge has an overall length of 941'-5" and consists of 7 total spans with 2-35 foot long spans on approaches to with 4 lines of 36W135 steel girders and a 5 span 871'-5" long continuous unit composed of 4 lines of welded structural steel plate girders with variable depth webs, cross frame diaphragms and longitudinal wind bracing. The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is

93,433 sq. ft.

Bridge #99: This bridge was built in 1965 and is located on NC 150 over the Seaboard Coastline RR near Lake Norman in Catawba County, NC. The bridge has an overall length of 154'-8" and consists of 3 total spans with 2-51'-10" long spans and 1-51'-0" long center span with 4 lines of 33WF118 steel girders with diaphragms. The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is

5,850 sq. ft.

Bridge #16: This bridge was built in 1950 and is located on NC 182 over the First Broad River near Lawndale in Cleveland County, NC. The bridge has an overall length of 328'-2" and consists of 6 total spans with 2-57'-1" long spans and 4-55'-0" long center spans with 4 lines of 30WF124 steel girders with cover plates and diaphragms. The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is

12,107 sq. ft.

Bridge #18: This bridge was built in 1948 and is located on NC 150 over the Broad River south of Boiling Springs near NC/SC line in Cleveland County, NC. The bridge has an overall length of 650'-0" and consists of 10 continuous spans 65'-0" long spans with 4 lines of 30WF108 steel girders with diaphragms. The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is

19,627 sq. ft.

Bridge #32: This bridge was built in 1950 and is located on NC 18 over US 74/NC 226 in Shelby in Cleveland County, NC. The bridge has an overall length of 183'-5" and consists of 4 total spans with 2-42'-6" long spans and 1-48'-6" long span and 1-49'-11" long span with 10 lines of various sized steel girders (30WF108, 33WF130 and 36WF150) with diaphragms. The existing paint system is foliage green (ALKYD) over zinc, and the estimated area to be cleaned and painted is

17,364 sq. ft.

Bridge #76: The bridge was built in 1955 as is located on NC 150 over Buffalo Creek on the near Stubbs in Cleveland County, NC. The bridge has an overall length of 225'-0" and consists of 5 total spans with 45 foot long spans with 4 lines of 36W150 steel girders with diaphragms. The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is

8,536 sq. ft.

Bridge #79: This bridge was built in 1936 and is located on US 74 EBL over the First Broad River in Shelby in Cleveland County, NC. The bridge has an overall length of 332'-0" and consists of 5 total spans with 2-67'-0" long spans and 3- 66'-0" long spans with 5 lines of various sized steel girders (36WF170 for exterior girder end span, 33WF152 interior girders end spans, 36WF150 for exterior girders interior spans and 33WF132 for interior girders interior spans) with diaphragms. The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is

15,754 sq. ft.

Bridge #80: This bridge was built in 1963 and is located on US 74 WBL over the First Broad River in Shelby Cleveland County, NC. The bridge has an overall length of 330'-0" and consists of 5 total spans with 5-66'-0" long spans with 4 lines of 36WF150 exterior girders and 36WF135 interior steel girders with diaphragms. The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is

13,073 sq. ft.

Bridge #88: This bridge was built in 1950 and is located on Morgan St. over US 74 in Shelby in Cleveland County, NC. The bridge has an overall length of 170'-0" and consists of 4 total spans with 2-37'-6" long spans, 1-48'-0" long span and 1-47'-0" long span with 4 lines of 30WF116 exterior girders and 30WF108 interior girders with diaphragms. The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is

5,076 sq. ft.

Bridge #56: This bridge was built in 1953 and is located on NC 275 over the South Fork of the Catawba River near Dallas in Gaston County, NC. The bridge has an overall length of 335'-6" and consists of 8 total spans with 2-35'-3" long spans, 3-35'-0" long spans and 3-65'-0" long spans with 4 lines of 27WF102 steel girders with diaphragms on spans 1,2,6,7&8 and 36WF150 steel girders with cover plates on spans 3&4 with diaphragms. The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is

12,523 sq. ft.

Bridge #71: This bridge was built in 1939 and is located on US29/74 over Southern Railway in Lowell in Gaston County, NC. The bridge has an overall length of 162'-8" and consists of 3 total spans with 2-39'-7" long spans and 1-83'-6" long spans with 15 lines of 33WF125 steel girders with cover plates on the original 9 interior girders and 30WF132 steel girders with cover plates on newer section of bridge with diaphragms. The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is

21,250 sq. ft.

Bridge #133: This bridge was built in 1960 and is located on Aberdeen Blvd. over I-85 in Gastonia in Gaston County, NC. The bridge has an overall length of 292'-2" and consists of 4 total spans with 1-73'-6" long span, 1-75'-8" long span, 1-75'-10" long span and 1-67'-2" long span with 4 lines of various size steel girders(Span 1 Ext. 36WF160 and Int. 36WF150, Span 2& 3 36WF230, Span 4 Ext. 36WF194 and Int. 36WF 170) with diaphragms. The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is

11,831 sq. ft.

Bridge #1: This bridge was built in 1960 and is located on SR 2362 over Third Creek near the Iredell Co. and Rowan Co. line near Statesville in Iredell County, NC. The bridge has an overall length of 192'-0" and consists of 5 total spans with 2-36'-0" long spans, 2-35'-0" long spans and 1 50'-0" long spans with 4 lines of 27WF94 steel girders with diaphragms for all spans except span 4 it has 4 lines of 33WF130 steel girders with diaphragms. The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is

5,881 sq. ft.

Bridge #50: This bridge was built in 1955 and is located on SR 1502 over I-40 on the Iredell Co. and Catawba Co. line in Iredell County, NC. The bridge has an overall length of 192'-0" and consists of 4 total spans with 2-43'-0" long spans and 2-53'-0" long spans with 4 lines of 36W160 steel girders with diaphragms on the interior spans and 4 lines of 36WF150 girders on exterior girders end spans and 30WF124 girders for interior girders end spans with diaphragms. The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is

6,836 sq. ft.

Bridge #174: This bridge was built in 1969 and is located on I-40 EBL over Five Mile Branch near Statesville in Iredell County, NC. The bridge has an overall length of 105'-0" and consists of 3 total spans with 3-35 foot long spans with 6 lines of 30W99 exterior steel girders and 30W108 interior steel girders with diaphragms. The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is

5,533 sq. ft.

Bridge #35: This bridge was built in 1955 and is located on NC 150 over the South Fork of the Catawba River near Lincolnton in Lincoln County, NC. The bridge has an overall length of 370'-6" and consists of 7 total spans with 2-40'-3" long spans, 3-70'-0" long spans and 2-40'-0" long spans with 4 lines of 33WF141 steel girders for spans 1,4,5&6 and 36WF182 steel girders for spans 2 &3 with diaphragms. The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is

13,307 sq. ft.

Bridge #50: This bridge was built in 1961 and is located on NC 73 over the Catawba River on the Lincoln Co. and Mecklenburg Co. line in Lincoln County, NC. The bridge has an overall length of 882'-6" and consists of 11 total spans with 2-70'-0" long spans with 4 lines of 36WF182 exterior girders and 36WF170 interior girders and a 9 span 742'-6" long continuous unit composed of 4 lines of 36WF182 structural steel girders with cover plates and diaphragms. The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is

30,897 sq. ft.

Paints on all bridges (regardless of color), contain red lead and other hazardous constituents. All cleaning and surface preparation activities must prevent dispersion of debris into the environment.

Surface area shown is approximate and may vary from the actual quantity to be painted. The Contractor is responsible for determining the actual area to be painted.

UNDER STRUCTURE WORK PLATFORM

(12-5-12)

Prior to any painting operations on the structure, provide details for a sufficiently sized under structure work platform which will provide access for cleaning and painting the bridge. The Contractor shall determine the required capacity of the platform, but the capacity shall not be less than that required by Federal or State regulations. Design steel members to meet the requirements of the American Institute of Steel Construction Manual. Design timber members in accordance with the "National Design Specification for Stress-Grade Lumber and Its Fastenings" of the National Forest Products Association. The platform shall be constructed of materials capable of withstanding damage from any of the work required on this project and shall be fireproof. Submit the platform design and plans for review and approval. The design and plans shall be sealed and signed by a North Carolina registered Professional Engineer. Do not install the platform until the design and plans are approved. Drilling holes in the superstructure for the purpose of attaching the platform is prohibited. Upon completion of work, remove all anchorages in the substructure and repair the substructure at no additional cost to the Department.

The platform shall be cleaned after each work day to prevent materials from falling or washing below.

Under Structure Work Platform Bridge #___ will be paid at the lump sum contract price and will be full compensation for the design, materials, installation, maintenance, and removal of the platform

Payment will be made under:

Pay Item	Pay Unit
Under Structure Work Platform Bridge #___	Lump Sum

BRIDGE JACKING

SPECIAL

1.0 GENERAL

Bridge jacking is to facilitate repairs to girders and to replace bearings, as indicated in the plans. Contractor shall submit, for review and approval, a proposed Jacking Plan. Prior to bridge jacking, complete all diaphragm modifications at the pier being jacked. Jack girders

on one side of the bent at the locations shown on the plans and in the sequence noted on the Jacking Plan.

2.0 UTILITY COORDINATION

Utility owners with active utilities on the bridge shall be notified by the contractor of the jacking operation 30 days before the operation begins.

3.0 SCOPE OF WORK

Work for bridge jacking includes setting blocking and jacks, jacking bridge girders, mechanically locking jacks, setting and maintaining devices to monitor location of girders, and lowering bridge spans onto bearing assemblies, after required repairs are complete.

4.0 BASIS OF PAYMENT

Payment will be made at the lump sum price bid for *Bridge Jacking Bridge #*___. Such lump sum price will be full compensation for all materials, equipment, tools, labor, and incidentals necessary to complete the work.

TEMPORARY STEEL COVER FOR EXPANSION JOINT SEAL REPAIR SPECIAL

Description

Install temporary steel plate covers on deck slab areas subject to demolition and reconstruction of expansion joint modifications for Bridge 91 in Catawba County for traffic maintenance. Steel plate covers shall be installed as needed to maintain vehicular traffic over work areas when necessary throughout all stages of joint construction. This work shall be in accordance with the details shown in the plans, and as directed by the Engineer. Steel plate covers shall be sized and detailed to permit installation, removal, and reuse as work progresses in the reconstruction of the expansion joint seals through all stages of construction.

Materials

Refer to Division 10 of the Standard Specifications

Item	Section
Structural Steel	1072
Elastomeric Bearing Strip	1079
Removable Anchorage for Steel Cover Plate	1074-2, 1081-1
High Strength, Nonmetallic Grout	1081
Epoxy, Type 2	1081
Aggregate, #1S	1005-3

Structural steel shall conform to AASHTO M270 Grade 36.

Elastomeric Bearing Strip shall be plain unreinforced elastomer sheets furnished to width and thickness specified in the plans and with length sufficient to continuously support steel cover plates. Elastomer material shall be Grade 50 (durometer hardness). Elastomeric Bearing Strips shall be furnished with holes of size and spacing conforming to requirement shown in the plans

and as verified in the field to permit passage of bolts for anchorage of steel cover plates to concrete surfaces.

Removable Anchorage for Steel Cover Plate may be in the form of approved expansion type anchors or epoxy adhesive anchoring systems. Anchor bolts furnished for steel cover plates shall permit multiple installations involving removal and replacement of cover plates during construction. Anchor bolts shall be capable of developing ultimate tension (pull out) and shear resistance specified in the plans. Length and/or projection of anchor bolts shall be sized to preclude projection of any part of the anchor bolt above the top surface of the steel cover plate. Contractor shall propose a suitable means of anchorage for cover plates in bituminous roadway pavement.

Material furnished for filling holes in finished concrete surfaces once anchor bolts are removed and no longer needed for plate anchorage shall be of an approved high strength, nonmetallic grout. Grout used shall be approved by the Engineer.

Construction Methods

Contractor shall furnish detailed shop drawings providing construction sequencing, steel plate details, bearing strip details, and product data sheets for all components required for Temporary Steel Cover for Expansion Joint Seal Repair. Submissions shall be in accordance with requirements of Submittal of Working Drawings. Steel plate details shall show plate dimensions, all anchor bolt hole locations as well as provisions for lifting steel plates during joint installation. Galvanizing steel plates will not be required. Shop drawings shall make provision for bolt hole locations that will avoid conflicts with existing deck reinforcement. Plate fabrication shall not proceed until shop drawings have been approved by the Department.

Top surface areas of cover plates shall be coated with a combination of epoxy and aggregate to provide skid resistance for steel surfaces. Epoxy shall be applied at a rate of 0.15 – 0.20 gal/yd². Once epoxy is applied to the steel surface and before it is cured, aggregate shall be broadcast over coated surfaces at a rate of 10 – 15 lbs/yd². Care shall be taken to ensure that epoxy material is kept out of recessed holes in plates used for anchorage. Contractor shall monitor performance of the epoxy aggregate coating once cover plates are in service and shall repair any damaged areas as directed by the Engineer.

Contractor shall drill holes into existing concrete bridge deck and roadway surfaces by means of a template or jig to ensure proper hole locations are met. Care shall be exercised to avoid cutting existing reinforcement in the deck slab. Holes may be repositioned slightly as found necessary to clear reinforcing steel. Contractor shall take all reasonable measures to ensure that bolt hole positions do not conflict with existing reinforcing bars. These hole positions shall be incorporated into cover plate details.

Elastomeric Bearing Strips shall be placed between concrete surfaces and temporary steel cover plates at all times. Traffic shall not be permitted to operate on cover plates that are not supported on bearing strips. In the event that bearing strips are damaged by construction activities or traffic operations, the contractor shall replace damaged components with bearing strips that meet with the approval of the Engineer.

Provide 5/8" diameter x 10" long anchor studs welded to retainer rails. Use ASTM A108 Grade 1018 steel for all studs. Type A studs in accordance with ANSI/AWS/AASHTO Bridge Welding Code D1.5 shall be furnished.

Provide 1/2" diameter weep holes in the retainer rails at 2 foot centers to allow bleeding of trapped air and/or water. Do not obstruct the weep holes with falsework.

Use lubricant adhesive conforming to ASTM D4070.

Use a neoprene gland that is an extruded synthetic rubber utilizing virgin polychloroprene as the only polymer. Require the manufacturer to provide Type 4 certification, in accordance with the Standard Specifications, that the gland has been tested for the following properties:

PHYSICAL PROPERTY	TEST METHOD	REQUIREMENTS
Tensile Strength, psi (min.)	ASTM D412	2000
Elongation at break, % (min.)	ASTM D412	250
Hardness, Type A durometer, points	ASTM D2240 Modified	60 ± 10
Oven aging, 70h @ 212°F Tensile strength, % change (max.) Elongation, % change (max.) Hardness, points change (max.)	ASTM D573	-20 -20 0 to +10
Oil Swell, ASTM Oil No. 3, 70h @ 212°F Weight change, % (max.)	ASTM D471	45
Ozone resistance 20% strain, 300 pphm in air 70h @ 104°F	ASTM D1149 Modified	No cracks
Low temperature stiffening, 7 days @ 14°F Hardness, Type A durometer, points change	ASTM D2240	0 to +15
Compression Set, 70h @ 212°F (max.)	ASTM D395 Method B (modified)	40%

Use one continuous neoprene gland for the entire length of the joint. Only vulcanized shop splicing of the gland is permitted. Field splicing of the neoprene gland is not permitted.

3.0 SHOP DRAWINGS

Submit working drawings in accordance with these provisions to the Engineer for review, comments and acceptance. Have someone other than the one who prepares the drawings check all detailed drawings and include the signatures of both the drafter and checker on each sheet of the drawings. The Engineer returns unchecked drawings to the Contractor.

Provide all completed drawings well in advance of the scheduled installation time for the strip seal expansion joint.

Show all dimensions, stud anchor locations, welded splice details, splice locations and any other data necessary to fabricate the joint on the shop drawings. Draw all details to scale. Identify, in detail, welding procedures to be performed in fabricating the joint. As a minimum, also show the following on the drawings:

The method of supporting retainer rails horizontally and vertically during joint installation and placement of concrete to ensure stability and proper alignment. Place supports near field splices of retainer rails to ensure that splices are straight and even.

A section detail through the joint showing horizontal offset dimensions of the rails from the centerline joint. This detail is required when the vertical face of the joint opening is not perpendicular to the roadway surface (e.g. when the roadway grade is significant).

Details of the shipping device for retainer rails.

4.0 SHIPMENT

Bolt the steel retainer rails together in the shop to form matching pairs. Clearly mark each pair to identify where they are to be placed. Ship the neoprene gland concurrently with the steel retainer rails and clearly mark them to identify where they are to be placed.

5.0 INSTALLATION

Follow the manufacturer's recommended installation procedures. Have a manufacturer's representative present during installation of the joint.

6.0 INSPECTION

When concrete is cast, use a non-aluminum, 10 foot, true to line straight edge to check and grade the top of the slab on each side of the joint to ensure smooth transition between spans.

The Engineer inspects the joint system for proper alignment and proper stud placement and attachment. If any aspect of the strip seal expansion joint is deemed unacceptable, make the necessary corrections.

Watertight Integrity Test

Upon completion of each strip seal expansion joint, perform a water test on the top surface to detect any leakage. Cover the roadway section of the joint from the roadway centerline to curb with water, either ponded or flowing, not less than one (1) inch above the roadway surface at all points. Block sidewalk sections and secure an unnozzled water hose delivering approximately 1 gallon of water per minute to the inside face of the bridge railing, trained in a downward position about 6 inches above the sidewalk, such that there is continuous flow of water across the sidewalk and down the curb face of the joint.

Maintain the ponding or flowing of water on the roadway and continuous flow across sidewalks and curbs for a period of 5 hours. At the conclusion of the test, the underside of the joint is to be closely examined for leakage. The strip seal expansion joint is considered watertight if no obvious wetness is visible on the Engineer's finger after touching a number of underdeck areas. Damp concrete that does not impart wetness to the finger is not considered a sign of leakage.

If the joint system leaks, locate the place(s) of leakage and take any repair measures necessary to stop the leakage at no additional cost to the Department. Use repair measures recommended by the manufacturer and approved by the Engineer prior to beginning corrective work.

If measures to eliminate leakage are taken, perform a subsequent water integrity test subject to the same conditions as the original test. Subsequent tests carry the same responsibility as the original test and are performed at no additional cost to the Department.

7.0 BASIS OF PAYMENT

Basis of payment for all strip seals will be at the lump sum contract price for "Strip Seals" which price and payment will be full compensation for furnishing all material, including any steel accessory plates for sidewalks, medians and rails, labor, tools, and incidentals necessary for installing the strip seal in place and including all materials, labor, tools and incidentals for performing the original watertight integrity test.

THERMAL SPRAYED COATINGS (METALLIZATION)

(9-30-11)

1.0 DESCRIPTION

Apply a thermal sprayed coating (TSC) and sealer to metal surfaces as specified herein when called for on the plans or by other Special Provisions, or when otherwise approved by the Engineer in accordance with the SSPC-CS 23.00/AWS C2.23/NACE No. 12 Specification. Only Arc Sprayed application methods are used to apply TSC coatings, the Engineer must approve other methods of application.

2.0 QUALIFICATIONS

Only use NCDOT approved TSC Contractors meeting the following requirements:

1. The capability of blast cleaning steel surfaces to SSPC SP-5 and SP-10 Finishes.
2. Employ Spray Operator(s) qualified in accordance with AWS C.16/C2.16M2002 and Quality Control Inspector(s) who have documented training in the applicable test procedures of ASTM D-3276 and SSPC-CS 23.00.

A summary of the contractor's related work experience and the documents verifying each Spray Operator's and Quality Control Inspector's qualifications are submitted to the Engineer before any work is performed.

3.0 MATERIALS

Provide wire in accordance with the metallizing equipment manufacturer’s recommendations. Use the wire alloy specified on the plans which meets the requirements in Annex C of the SSPC-CS 23.00 Specification. Have the contractor provide a certified analysis (NCDOT Type 2 Certification) for each lot of wire material.

Apply an approved sealer to all metallized surfaces in accordance with Section 9 of SSPC-CS 23. The sealer must either meet SSPC Paint 27 or is an alternate approved by the Engineer.

4.0 SURFACE PREPARATION AND TSC APPLICATION

Grind flame cut edges to remove the carbonized surface prior to blasting. Bevel all flame cut edges in accordance with Article 442-10(D) regardless of included angle. Blast clean surfaces to be metallized with grit or mineral abrasive in accordance with Steel Structures Painting Council SSPC SP-5/10(as specified) to impart an angular surface profile of 2.5 - 4.0 mils. Surface preparation hold times are in accordance with Section 7.32 of SSPC-CS 23. If flash rusting occurs prior to metallizing, blast clean the metal surface again. Apply the thermal sprayed coating only when the surface temperature of the steel is at least 5°F above the dew point.

At the beginning of each work period or shift, conduct bend tests in accordance with Section 6.5 of SSPC-CS 23.00. Any disbonding or delamination of the coating that exposes the substrate requires corrective action, additional testing, and the Engineer’s approval before resuming the metallizing process.

Apply TSC with the alloy to the thickness specified on the plans or as provided in the table below. All spot results (the average of 3 to 5 readings) must meet the minimum requirement. No additional tolerance (as allowed by SSPC PA-2) is permitted. (For Steel Beams: For pieces with less than 200 ft² measure 2 spots/surface per piece and for pieces greater than 200 ft² add 1 additional spots/surface for each 500 ft²).

Application	Thickness	Alloy	Seal Coat
Pot Bearings	8 mil	85/15 Zinc (W-Zn-Al-2)	0.5 mil
Armored Joint Angles	8 mil	85/15 Zinc (W-Zn-Al-2)	0.5 mil
Modular Joints	8 mil	99.99% Zn (W-Zn-1)	0.5 mil
Expansion Joint Seals	8 mil	99.99% Zn (W-Zn-1)	0.5 mil
Optional Disc Bearings	8 mil	85/15 Zinc (W-Zn-Al-2)	0.5 mil

When noted on the plans or as specified in the above chart, apply the sealer to all metallized surfaces in accordance with the manufacturer’s recommendations and these provisions. Apply the seal coat only when the air temperature is above 40°F and the surface temperature of the steel is at least 5°F above the dew point. If the sealer is not

applied within eight hours after the final application of TSC, the applicator verifies acceptable TSC surfaces and obtains approval from the Engineer before applying the sealer.

5.0 INSPECTION FREQUENCY

The TSC Contractor must conduct the following tests at the specified frequency and the results documented in a format approved by the Engineer.

Test/Standard	Location	Frequency	Specification
Ambient Conditions	Site	Each Process	5°F above the dew point
Abrasive Properties	Site	Each Day	Size, angularity, cleanliness
Surface Cleanliness SSPC Vis 1	All Surfaces	Visual All Surfaces	SSPC-SP-10 Atmospheric Service SSPC-SP - 5 Immersion Service
Surface Profile ASTM D-4417 Method C	Random Surfaces	3 per 500 ft ²	2.5 - 4.0 mils
Bend Test SSPC-CS 23.00	Site	5 per shift	Pass Visual
Thickness SSPC PA-2R SSPC-CS 23.00	Each Surface	Use the method in PA-2 Appendix 3 for Girders and Appendix 4 for frames and miscellaneous steel. See Note 1.	Zn - 8 mils minimum Al - 8 mils minimum Zn Al - 8 mils minimum Areas with more than twice the minimum thickness are inspected for compliance to the adhesion and cut testing requirements of this specification.
Adhesion ASTM 4541	Random Surfaces Splice Areas	1 set of 3 per 500 ft ²	Zn > 500 psi Al > 1000 psi Zn Al > 750 psi
Cut Test - SSPC-CS 23.00	Random Surfaces	3 sets of 3 per 500 ft ²	No peeling or delamination
Job Reference Std. SSPC-CS 23.00	Site	1 per job	Meets all the above requirements

6.0 REPAIRS

All Repairs are to be performed in accordance with the procedures below, depending on whether the repair surface is hidden or exposed. As an exception to the following, field welded splices on joint angles and field welding bearing plates to girders may be repaired in accordance with the procedures for hidden surfaces.

For hidden surfaces (including but not limited to interior girders, interior faces of exterior girders, and below-grade sections of piles):

1. Welding of metallized surfaces may be performed only if specifically permitted by the Engineer. Remove metallizing at the location of field welds by blast cleaning (SSPC SP-6 finish), or hand (SSPC SP-2 finish) or power tool cleaning (SSPC SP-3 finish) just prior to welding. Clean sufficiently to prevent contamination of the weld. All repairs to welded connections are metallized in accordance with SSPC CS 23.00.

2. Minor areas less than or equal to 0.1 ft² exposing the substrate are metallized in accordance with SSPC CS 23.00 or painted in accordance with ASTM A780, "Repair of Damaged and Uncoated Areas of Hot Dip Galvanized Coatings."
3. Large areas greater than 0.1 ft² exposing the substrate are metallized in accordance with SSPC CS 23.00.
4. Damaged (burnished) areas not exposing the substrate with less than the specified coating thickness are metallized in accordance with SSPC CS 23.00 or painted in accordance with ASTM A780, "Repair of Damaged and Uncoated Areas of Hot Dip Galvanized Coatings."
5. Damaged (burnished) areas not exposing the substrate with more than the specified coating thickness are not repaired.
6. Defective coating is repaired by either method 2 or 3 depending on the area of the defect.

For Exposed Surfaces (including but not limited to exterior faces of exterior girders and above-grade sections of piles):

1. Welding of metallized surfaces may be performed only if specifically permitted by the Engineer. Remove metallization at the location of field welds by blast cleaning (SSPC SP-6 finish), or hand (SSPC SP-2 finish) or power tool cleaning (SSPC SP-3 finish) just prior to welding. Clean sufficiently to prevent contamination of the weld. All repairs to welded connections are metallized in accordance with SSPC CS 23.00.
2. All areas exposing the substrate are metallized in accordance with SSPC CS 23.00
3. Defective coating is repaired by either method 2 or 3 depending on the area of the defect.

7.0 TWELVE MONTH OBSERVATION PERIOD

The contractor maintains responsibility for the coating system for a twelve (12) month observation period beginning upon the satisfactory completion of all the work required in the plans or as directed by the engineer. The contractor must guarantee the coating system under the payment and performance bond (refer to Article 109-10). To successfully complete the observation period, the coating system must meet the following requirements after twelve(12) months service:

- No visible rust, contamination or application defect is observed in any coated area.
- Painted surfaces have a uniform color and gloss.
- Surfaces have an adhesion of no less than 500 psi when tested in accordance with ASTM D-4541.

8.0 BASIS OF PAYMENT

No separate payment will be made for thermal sprayed coatings. The cost of such work will be considered incidental to the various items in the contract.

PARTIAL REMOVAL OF EXISTING STRUCTURE

SPECIAL

Scope of Work

Work to repair deck and joints includes removal of existing joint seal materials and concrete at the expansion bents of the simply supported spans and/or continuous units throughout the length of the bridge as shown in the plans.

Remove existing concrete, elastomeric or asphaltic concrete seal materials, as well as any and all existing metal joint cover hardware in joint areas, in addition to any other existing joint materials to limits shown in the plans. Contractor shall remove existing concrete with concrete saws and hand tools. Use of hoe rams and wrecking balls will not be permitted. Dispose of debris once removed from the structure in accordance with the standard specifications. Contractor shall exercise care to ensure that all existing deck slab and diaphragm reinforcing steel exposed by concrete and joint material removal remains undamaged. All damaged reinforcing steel shall be repaired by the contractor at contractor's expense to the satisfaction of the engineer.

Tools and equipment used for partial demolition of existing structure shall be approved by the Engineer.

Upon removal of deck sections install deck forms and reinforcing steel as applicable; and place Concrete for Deck Repair to match the finished deck surface elevations in accordance with applicable provisions detailed in Section 420 of the *Standard Specifications* or as required by these special provisions. Unless otherwise indicated on the plans, groove finished surface areas in accordance with Article 420-14(B) of the *Standard Specifications*.

Measurement and Payment

Partial Removal of Existing Structure will be paid for at the lump sum contract price and will be full compensation for all materials, shop drawings, equipment, tools, labor, and incidentals necessary to remove the existing deck, elastomeric concrete or asphalt concrete infill materials, any remaining metal joint cover hardware, foam joint seal materials, or other portions of the existing structure as indicated in the plans.

Costs to replace the sections of deck removed, including labor for placement of reinforcing steel, shop drawings as required for formwork as well as labor and materials for construction of formwork, finishing Concrete for Deck Repair, and all other incidentals necessary for replacement of existing concrete removed for joint repairs shall be paid for by the contract bid price per square foot of *Reinforced Concrete Deck Slab*. Payment will be full compensation to complete the work as described in the plans and these provisions.

Payment will be made under:

Pay Item	Pay Unit
Partial Removal of Existing Structure Bridge # _____	Lump Sum
Reinforced Concrete Deck Slab	Square Feet

CONCRETE FOR DECK REPAIR

SPECIAL

Description

Work described herein details requirements for procurement and placement of high early strength structural concrete to be used for reconstruction of deck slab and bent diaphragm regions as noted in the plans.

Materials

Furnish pre-proportioned, bagged concrete mix or bulk concrete materials in a mix proportioned to satisfy provisions for Class AA Concrete detailed in Section 1000-4 of the *Standard Specifications* or as otherwise noted in these provisions. Concrete mix shall meet the following requirements:

Physical Property	Threshold Limitation	Test Method
Compressive Strength (psi) @ 3 hrs.	4,500 (min.)	ASTM C 39/C109
Physical Property	Threshold Limitation	Test Method
Slump (in.)	4 (min.) 7 (max.)	AASHTO T 119
Maximum Water to Cement Ratio	0.450	N/A
Modulus of Elasticity (ksi) @ 28 days	5,200 (max.)	ASTM C 469
Coefficient of Thermal Expansion (in./in./°F) @ 28 days	4.5 (min.) 5.5 (max.)	AASHTO TP 60
Concrete Setting Times (Minutes)		ASTM C 191
Initial Set	30 (max.)	
Final Set	40 (max)	

Concrete furnished for deck repairs shall be capable of placement on existing concrete substrate surfaces within the following temperature limitations:

- 40 °F (4.4 °C) (min.)
- 100 °F (37.7 °C) (max.)

For equipment, proportioning and mixing of concrete compositions, see Section 1000-12 of the *Standard Specifications* and the Special Provision entitled “High performance Volumetric Mixers”. Prior to beginning any work, obtain approval for all equipment to be used for

preparation of expansion joint areas, mixing, placing, finishing, and curing the deck repair concrete.

Measurement for determination of concrete material compositions shall be in accordance with Section 1000-8 of the *Standard Specifications* and the following modifications:

Page 10-11, last paragraph of 1000-8, add the following:

Submit pre-packaged concrete mix contents by analysis or concrete mix design, including laboratory compressive strength data for a minimum of six 4-inch by 8-inch cylinders at an age of 1.) 3 hours; and 2.) 1 day to the Engineer for review. Include test results for the slump and air content of the laboratory mix. Perform tests in accordance with AASHTO T 22, T 119 and T 152.

Preparation of Existing Concrete Surfaces

Remove existing deck slab concrete to limits shown in the plans. Existing concrete that is deteriorated, cracked or spalled shall be removed to sound material. Completely clean all surfaces of grease, oil, curing compounds, acids, dirt, or loose debris no more than 24 hours prior to placing deck repair concrete unless otherwise approved.

Thoroughly soak and cover existing clean concrete surfaces for at least 2 hours prior to placing Concrete for Deck Repair. Immediately prior to placing the Concrete for Deck Repair, remove any standing water from existing surfaces surface.

Placing and Finishing

Prior to placing Concrete for Deck Repair at foam joint seal installations, install a rigid bulkhead at expansion joints to the required grade and profile.

Secure strip seal retainer rails in final position to match existing grade line profile and cross slope at each location. Furnish falsework to support retainer rails during installation as described in the special provision entitled "Strip Seals".

Secure guides in position to ensure finishing the new surface at expansion joint locations to the required profile and cross slope. Do not treat screed rails with parting compound to facilitate their removal.

To establish a mechanical bond, all concrete substrate surfaces shall be prepared with a minimum profile of one-eighth of an inch (1/8").

Place the Concrete for Deck Repair monolithically in one operation. Concrete shall not be placed in layers. Sections to be reconstructed are to be filled full depth and shall progress horizontally. Deviation from this procedure shall be cause for rejection.

Construction joints other than those shown on the plans will not be permitted unless approved by the Engineer.

When a tight, uniform surface is achieved and before the concrete becomes non-plastic, further finish the top surface of the deck repair by burlap dragging or another acceptable method that produces an acceptable uniform surface texture.

As soon as the surface supports burlap without deformations, cover the surface with a single layer of clean, wet burlap.

Place Concrete for Deck Repair only after the burlap is saturated and approved by the Engineer. Drain excess water from the wet burlap before placement.

Wet cure the Concrete for Deck Repair for a minimum of 3 hours or until at least 4500 psi compressive strength is obtained. Wet cure the fresh concrete through maintenance of a wet saturated surface as soon as it is possible to place burlap on the surface without damaging the finished surface. Place a layer of 4 mil (0.100 mm) white opaque polyethylene film on the wet burlap and cure the surface a minimum of 3 hours. Other wet cure methods are permitted but must be approved by the Engineer prior to start of placement.

As soon as practical, after the concrete has hardened sufficiently, test the finished surface with an approved rolling straightedge that is designed, constructed, and adjusted so that it will accurately indicate or mark all floor areas which deviate from a plane surface by more than 1/8 inch in 10 feet (3 mm in 3 m). Remove all high areas in the hardened surface in excess of 1/8 inch in 10 feet (3 mm in 3 m) with an approved grinding or cutting machine. Where variations are such that the corrections extend below the limits of the top layer of grout, seal the corrected surface with an approved sealing agent if required by the Engineer. If approved by the Engineer, correct low areas in an acceptable manner.

Groove finished concrete surfaces in the vicinity of expansion joint seals deck unless otherwise shown in the plans.

Limitations of Operations

The volumetric mixer may be permitted on the bridge deck. Submit mixer size and weight data to the Engineer for review.

No vehicular or construction traffic is permitted on finished Concrete for Deck Repair prior to evidence being provided that the minimum compressive strength referred to above is satisfied by compressive strength tests made in accordance with AASHTO T 22 and T 23.

Do not place Concrete for Deck Repair if the temperature of the concrete surface on which the overlay is to be placed is below 40°F (4.4°C) or above 95°F (35.0°C). Measure the surface temperature by placing a thermometer under insulation placed against the surface.

Prior to placing Concrete for Deck Repair, the Engineer shall determine the air temperature and wind speed. Do not place Concrete for Deck Repair if the ambient air temperature is below 45°F (7.2°C) or above 85°F (29.4°C), or if the wind velocity is in excess of 10 mph (16 km/h). If working at night, provide approved lighting. Provide aggregates for use in Concrete for Deck Repair that are free from ice, frost and frozen particles when introduced into the mixer.

Do not place concrete when the temperature of the Concrete for Deck Repair is below 45°F (7.2°C) or above 85°F (29.4°C).

If the rate of evaporation of surface moisture from the Concrete for Deck Repair exceeds 0.10 pounds per square foot per hour during placement, measures shall be taken to reduce the rate of evaporation. The evaporation rate is calculated using the following formula:

$$E=(T_c^{2.5}-rT_a^{2.5})(1+0.4V)(10^{-6}) \text{ where,}$$

$$E=\text{Evaporation Rate, } T_c=\text{Concrete Temp (}^{\circ}\text{F), } r=\text{Relative Humidity (\%/100)}$$

T_a =Air Temp ($^{\circ}$ F), V=Wind Velocity (mph)

Do not place Concrete for Deck Repair if the National Weather Service predicts the air temperature at the site to be below 35 $^{\circ}$ F (1.7 $^{\circ}$ C) during the next 72 hours. If this predicted air temperature is above 35 $^{\circ}$ F (1.7 $^{\circ}$ C) but below 50 $^{\circ}$ F (10 $^{\circ}$ C), then use insulation to protect the concrete for a period of at least 48 hours. Use insulation that meets the requirements of Subarticle 420-7(C) of the *Standard Specifications* and, if required, place it on fresh concrete surfaces as soon as initial set permits. When using insulation to protect Concrete for Deck Repair during the wet curing period, do not remove the insulation until the ambient air temperature is at least 40 $^{\circ}$ F (4.4 $^{\circ}$ C) and rising.

Contractor assumes all risks connected with the placement of Concrete for Deck Repair under cold weather conditions referred to above.

Stop all placement operations during periods of precipitation. Take adequate precautions to protect freshly placed Concrete for Deck Repair from sudden or unexpected precipitation. Keep an adequate quantity of protective coverings at the worksite to protect the freshly placed concrete from precipitation.

Measurement and Payment

Concrete for Deck Repair will be measured and paid as the number of cubic yards incorporated into the completed and accepted structure. This price and payment will be full compensation for furnishing and placing the Concrete for Deck Repair.

Pay Item

Concrete for Deck Repair

Pay Unit

Cubic Yard

HIGH PERFORMANCE VOLUME MIXERS

SPECIAL

Description

Work described herein details requirements for batching Concrete for Deck Repair at the point of delivery using a Mobile High Performance Volume Mixer (MHPVM). Work shall be in accordance with general requirements of Section 1000-12 of the *Standard Specifications* and as amended by these provisions.

Materials

Contractor shall produce high early strength concrete in accordance with the Special Provision entitled “Concrete for Deck Repair” with MHPVM equipment. Contractor shall furnish project site storage facilities that will provide protection of constituent materials in accordance with the *Standard Specifications* and all material suppliers’ recommendations.

Equipment

MHPVM devices shall have stamped metal plate or plates from the Volumetric Mixers Manufacturers Bureau stating that the equipment conforms to the requirements of ASTM C685 prominently displayed.

Hydraulic cement concrete shall be mixed at the point of delivery by a combination of materials transport and mixer unit conforming to the following:

- 1.) The unit shall be equipped with calibrated proportioning devices for each ingredient added to the concrete mix. The unit shall be equipped with a working recording meter that is visible at all times and furnishes a ticket printout with the calibrated measurement of the mix being produced. If at any time the mixer fails to discharge a uniform mix, production of concrete shall be suspended until such time that problems are corrected.
- 2.) Each unit shall have a metal plate(s) attached in a prominent place by the manufacturer on which the following are plainly marked: a.) the gross volume of the transportation unit in terms of mixed concrete, b.) the discharge speed, c.) the mass calibrated constant of the machine in terms of volume.
- 3.) MHPVMs shall be calibrated by a Department approved testing agency in accordance with the manufacturer's recommendations at an interval of every 6 months or a maximum production of 2500 cubic yards, whichever comes first prior to use on the project. The yield shall be maintained within a tolerance of +/- 1 percent and verified using a minimum 2 cubic feet container every 500 cubic yards or a minimum of once per week.
- 4.) The three cubic feet initially discharged from the truck shall be discarded and not used for concrete placement. Acceptance of the concrete shall comply with the Standard Specifications except that the sample secured for acceptance testing will be taken after four cubic feet is discharged from the delivery vehicle. During discharge, the consistency as determined by ASTM C 143 on representative samples taken from the mixer discharge at random intervals shall not vary by more than 1 inch. Acceptance tests shall be performed on each load. If test data demonstrates that acceptable consistency of concrete properties is being achieved, the Engineer may reduce testing requirements.
- 5.) MHPVM equipment shall be operated by a person who is a certified operator by the equipment manufacturer. Any equipment adjustments made during the on-site production of concrete shall be done under the direct on-site supervision of the producer's NCDOT Certified Concrete Batch Technician.

Uniformity and Acceptance

The contractor is responsible for having a Certified Concrete Plant Technician available during batching operations, and a Certified Concrete Field Technician shall be present during placing operations

Measurement and Payment

No separate payment will be made for High Performance Volumetric Mixers. The contract unit price bid for "Concrete for Deck Repair" will be full compensation for furnishing all equipment, labor, and materials to properly execute the work.

REPLACE BEARINGS

SPECIAL

1.0 GENERAL

This item consists of furnishing, fabrication and installation of new steel sliding plate bearings to replace existing bearings according to the recommendations specified herein and the contract drawings.

2.0 SCOPE OF WORK

Use AASHTO M270 Grade 50W (345W) for all steel in the sliding plate bearings. The existing bearings shall be replaced with bearings as shown on the contract drawings.

The girders shall be jacked according to the Bridge Jacking special provisions before commencing any work for bearing replacement. Thoroughly clean the exposed surfaces of all bearing plates, anchor bolts, nuts, washers, and steel plates embedded in the concrete girders, in the existing structure in accordance with the Article 442-7(B) of the Standard Specifications after jacking. Have the Engineer inspect and approve the replacement of bearing after cleaning. Do not install any bearing before the Engineer approves the new bearings. The sole plate shall be welded to the steel bridge beams according to contract drawings. Anchor bolts must be replaced after bearing replacement.

3.0 BASIS OF PAYMENT

Payment for all replacement bearings will be at the lump sum contract price bid for “Replace Bearings” which includes full compensation for furnishing all sliding plate bearings, labor, materials, tools, equipment, and incidentals required to complete the work in accordance with this Special Provision and as directed by the Engineer.

Payment will be made under:

Pay Item	Pay Unit
Replace Expansion Bearings	Each
Replace Fixed Bearings	Each

GIRDER REPAIR

SPECIAL

1.0 GENERAL

Cut and remove deteriorated girder portions at locations determined by Engineer, after blasting and priming for new paint system. The Engineer will determine the extent of the section to be removed. The repaired girder section shall be inspected by NCDOT during fit-up and approved before welding the new section may begin. After approval of the fit-up girder section, weld fit-up girder section into place. Welding shall be performed by certified welders as specified in the Standard Specifications.

2.0 FIELD ALTERATIONS

Since this repair involves working with an existing structure where the dimensions may vary throughout the structure, the contractor should expect and shall be prepared to make alterations in the field. This includes, but not limited to, having qualified personnel on hand to perform necessary alterations and having extra material on hand (or the ability to procure extra material in a timely manner). All such alterations shall be brought to the attention of the engineer and agreed upon prior to alteration.

3.0 BASIS OF PAYMENT

Payment will be made at the contract price bid per pounds structural steel used for *Girder Repair*. Such payment will be full compensation for all materials, equipment, tools, labor, welding, miscellaneous steel and incidentals necessary to complete the work.

SPECIAL PROVISIONS FOR PROTECTION OF RAILWAY INTEREST

Under the terms of these provisions, the North Carolina Department of Transportation shall hereinafter be called "Department", and the Norfolk Southern Railway Company shall hereinafter be called "Railroad".

1. AUTHORITY OF RAILROAD ENGINEER AND DEPARTMENT ENGINEER:

The authorized representative of the Railroad, hereinafter referred to as Railroad Engineer, shall have final authority in all matters affecting the safe maintenance of Railroad traffic including the adequacy of the foundations and structures supporting the Railroad tracks.

The authorized representative of the North Carolina Department of Transportation, hereinafter referred to as the Department Engineer, shall have authority over all other matters as prescribed herein including Project Specifications, Special Provisions, and the plans.

2. NOTICE OF STARTING WORK:

A. The Contractor shall not commence any work on Railroad right of way until he has complied with the following conditions:

- (1) Give the Railroad written notice, with copy to the Department Engineer who is designated to be in charge of the work, at least ten (10) days in advance of the date he proposes to begin work on Railroad right of way to:

Office of Chief Engineer - Bridges & Structures
Norfolk Southern Corporation
1200 Peachtree Street NE
Internal Box 142
Atlanta, Georgia 30309

- (2) Obtain written approval from the Railroad of Railroad Protective Liability Insurance coverage as required by section 14 herein. The Railroad does not accept notation of Railroad protective insurance on a certificate of liability insurance form or Binders as Railroad must have the full original countersigned policy. The policy will be reviewed for compliance prior to written approval. Due to the number of projects system-wide, it typically takes a minimum of 30-45 days for Railroad to review.
- (3) Obtain Railroad's Flagging Services as required by section 7 herein.

- (4) Obtain written authorization from the Railroad to begin work on Railroad's right of way, such authorization to include an outline of specific conditions with which he must comply.
 - (5) Furnish a schedule for all work within the Railroad right of way as required by section 7B1 herein.
- B. The Railroad's written authorization to proceed with the work will include the names, addresses, and telephone numbers of the Railroad's representatives who are to be notified as hereinafter required. Where more than one representative is designated, the area of responsibility of each representative will be specified.
3. INTERFERENCE WITH RAILROAD OPERATIONS:
- A. The Contractor shall so arrange and conduct his work that there will be no interference with Railroad operations, including train, signal, telephone and telegraphic services, or damage to the property of the Railroad or to poles, wires, and other facilities of tenants on the right of way of the Railroad. Whenever work is liable to affect the operations or safety of trains, the method of doing such work shall first be submitted to the Railroad Engineer for approval, but such approval shall not relieve the Contractor from liability. Any work to be performed by the Contractor which requires flagging service or inspection service (watchman) shall be deferred by the Contractor until the flagging protection or inspection service required by the Railroad is available at the job site.
 - B. Whenever work within Railroad's right of way is of such a nature that impediment to Railroad operations such as use of runaround tracks or necessity for reduced speed is unavoidable, the Contractor shall schedule and conduct his operations so that such impediment is reduced to the absolute minimum.
 - C. Should conditions arising from, or in connection with the work, require that immediate and unusual provisions be made to protect operations and property of the Railroad, the Contractor shall make such provisions. If in the judgment of the Railroad Engineer, or in his absence, the Railroad's Division Engineer, such provision is insufficient, either may require or provide such provisions as he deems necessary. In any event, such unusual provisions shall be at the Contractor's expense and without cost to the Railroad or the Department.

4. TRACK CLEARANCES:

A. The minimum track clearances to be maintained by the Contractor during construction are as follows:

(1) Horizontal clearance measured from centerline of track to falsework:

13'-0" on tangent track

14'-0" on curved track

(2) Vertical clearance from top of rail to falsework: 22'-0"

B. However, before undertaking any work within Railroad's right of way, or before placing any obstruction over any track, the Contractor shall:

(1) Notify the Railroad Engineer at least 72 hours in advance of the work.

(2) Receive assurance from the Railroad Engineer that arrangements have been made for flagging service as may be necessary.

(3) Receive permission from the Railroad Engineer to proceed with the work.

(4) Ascertain that the Department Engineer has received copies of notice to the Railroad and of the Railroad's response thereto.

5. CONSTRUCTION PROCEDURES:

A. General:

Construction work and operations by the Contractor on Railroad's property shall be:

(1) Subject to the inspection and approval of the Railroad.

(2) In accord with the Railroad's written outline of specific conditions.

(3) In accord with the Railroad's general rules, regulations and requirements including those relating to safety, fall protection and personal protective equipment.

(4) In accord with these Special Provisions.

B. Work Plan:

A Work Plan detailing all aspects of the maintenance activities on and around railroad right-of-way must be submitted to the Railroad and approved in writing prior to entry to or any work beginning in the railroad right-of-way the Work Plan shall include a detailed

construction schedule for the duration of the project clearly indicating the time periods for all work on and around the railroad right-of-way.

Provide a listing and location of the anticipated equipment to be used and ensure a contingency plan of action is in place should a primary piece of equipment malfunction. All work in the vicinity of railroad property that has the potential of affecting train operations must be submitted and approved by the Railroad prior to work being performed.

If a containment system is proposed over the track(s), the submittal must include a written installation and removal procedure and a plan showing the details of the system. This submittal is to include any work platforms with design loads and supporting calculations signed and sealed by a North Carolina registered Professional Engineer. The design of the system shall also be in accordance with OSHA and all applicable environmental standards. The containment system must provide 22'- 0" vertical clearance measured from the top of rail to the lowest point of the containment structure within 6'- 0" from the centerline of track. If the existing vertical clearance is less than 22'- 0", no reduction in vertical clearance is permissible. The containment system shall not encroach upon the horizontal clearance envelope of fourteen feet (14'- 0"). As measured perpendicularly from the centerline of the nearest track. Any proposed variances to the clearance requirements must be provided in writing and will require railroad approval, which may be withheld for any reason.

C. Maintenance of Railroad Facilities:

- (1) The Contractor will be required to maintain all ditches and drainage structures free of silt or other obstructions which may result from his operations and provide and maintain any erosion control measures as required. The Contractor will promptly repair eroded areas within Railroad's right of way and repair any other damage to the property of the Railroad or its tenants.
- (2) All such maintenance and repair of damages due to the Contractor's operations shall be done at the Contractor's expense.

D. Storage of Materials and Equipment:

Materials and equipment shall not be stored where they will interfere with Railroad operations, nor on the right of way of the Railroad without first having obtained permission from the Railroad Engineer, and such permission will be with the understanding that the Railroad will not be liable for damage to such material and equipment from any cause and that the Railroad Engineer may move or require the Contractor to move, at the Contractor's expense, such material and equipment.

All grading or construction machinery that is left parked near the track unattended by a watchman shall be effectively immobilized so that it cannot be moved by unauthorized persons. The Contractor shall protect, defend, indemnify and save Railroad, and any associated, controlled or affiliated corporation, harmless from and against all loss, costs,

expenses, claim or liability for loss of or damage to property or the loss of life or personal injury, arising out of or incident to the Contractor's failure to immobilize grading or construction machinery.

E. Cleanup:

Upon completion of the work, the Contractor shall remove from within the limits of the Railroad's right of way, all machinery, equipment, surplus materials, falsework, rubbish or temporary buildings of the Contractor, and leave said right of way in a neat condition satisfactory to the Chief Engineer of the Railroad or his authorized representative.

6. DAMAGES:

- A. The Contractor shall assume all liability for any and all damages to his work, employees, servants, equipment and materials caused by Railroad traffic.
- B. Any cost incurred by the Railroad for repairing damages to its property or to property of its tenants, caused by or resulting from the operations of the Contractor, shall be paid directly to the Railroad by the Contractor.

7. FLAGGING SERVICES:

A. Requirements:

Flagging services will not be provided until the Contractor's insurance has been reviewed and approved by the Railroad.

Under the terms of the agreement between the Department and Railroad, the Railroad has sole authority to determine the need for flagging required to protect its operations. In general, the requirements of such services will be whenever the Contractor's men or equipment are, or are likely to be, working on the Railroad's right of way, or across, over, adjacent to or under a track, or when such work has disturbed or is likely to disturb a Railroad structure, Railroad roadbed, or surface and alignment of any track to such extent that the movement of trains must be controlled by flagging.

Normally, the Railroad will assign one flagman to a project; but in some cases, more than one may be necessary, such as yard limits where three (3) flagmen may be required. However, if the Contractor works within distances that violate instructions given by the Railroad Engineer or performs work that has not been scheduled with the Railroad Engineer, a flagman or flagmen may be required full time until the project has been completed. Should such violations or unscheduled, unauthorized work by the Contractor result in full time flagging being required by the Railroad, the additional cost of such flagging above normal flagging cost shall be deducted from the final payment to the Contractor as provided in Article 109-9 of the Standard Specifications. Neither Department nor Railroad will be liable for damages resulting from unscheduled or unauthorized work.

B. Scheduling and Notification:

- (1) The Contractor's work requiring railroad flagging should be scheduled to limit the presence of a flagman at the site to a maximum of 50 hours per week. The Contractor shall receive Railroad approval of work schedules requiring a flagman presence in excess of 40 hours per week.
- (2) No later than the time that approval is initially requested to begin work on Railroad right of way, the Contractor shall furnish to the Department and Railroad a schedule for all work required to complete the portion of the project within Railroad right of way and arrange for a job site meeting between the Contractor, Department, and Railroad. Flagman or flagmen may not be provided until the job site meeting has been conducted and the Contractor's work scheduled.
- (3) The Contractor will be required to give the Railroad Engineer at least 10 working days of advance written notice of intent to begin work within Railroad's right of way in accordance with this special provision. Once begun, when such work is then suspended at any time, or for any reason, the Contractor will be required to give the Railroad Engineer at least 3 working days of advance notice before resuming work on Railroad's right of way. Such notices shall include sufficient details of the proposed work to enable the Railroad Engineer to determine if flagging will be required. If such notice is in writing, the Contractor shall furnish the Department Engineer a copy; if notice is given verbally, it shall be confirmed in writing with a copy to the Department Engineer.
- (4) If flagging is required, no work shall be undertaken until the flagman, or flagmen, is present at the job site. It may take up to 30 days to obtain flagging initially from the Railroad. When flagging begins, the flagman is usually assigned by the Railroad to work at the project site on a continual basis until no longer needed and cannot be called for on a spot basis. If flagging becomes unnecessary and is suspended, it may take up to 30 days to again obtain from the Railroad. Due to labor agreements, it is necessary to give 5 working days' notice before flagging service may be discontinued and responsibility for payment stopped.
- (5) If, after the flagman is assigned to the project site, emergencies arise which require the flagman's presence elsewhere, the Contractor shall delay work on Railroad right of way until such time as the flagman is again available. Any additional costs resulting from such delay shall be borne by the Contractor and not the Department or Railroad.

C. Payment:

- (1) The Department will be responsible for paying the Railroad directly for any and all costs of flagging which may be required to accomplish the construction. The Contractor shall reimburse the Railroad for any costs of the flagging which is required for work for the benefit of the Contractor.
- (2) The estimated cost of flagging service is the current rate per day based on a 10-hour work day. This cost includes the base pay for each flagman, overhead, and a per diem charge for travel expenses, meals and lodging. The charge by the Railroad will be the actual cost based on the rate of pay for the Railroad's employees who are available for flagging service at the time the service is required.
- (3) Work by a flagman in excess of 8 hours per day or 40 hours per week, but not more than 12 hours a day will result in overtime pay at 1½ times the appropriate rate. Work by a flagman in excess of 12 hours per day will result in overtime pay at 2 times the appropriate rate. If work is performed on a holiday, the flagging rate is 2½ times the normal rate.
- (4) Railroad work involved in preparing and handling bills will also be charged to the Department. Charges to the Department by the Railroad shall be in accordance with applicable provisions of the Federal-Aid Policy Guide, Title 23 Subchapter B, Part 140I and Subchapter G, Part 646B issued by the Federal Highway Administration on December 9, 1991, including all current amendments. Flagging costs are subject to change. The above estimates of flagging costs are provided for information only and are not binding in any way.

D. Verification:

- (1) Railroad's flagman will electronically enter flagging time via Railroad's electronic billing system. Any complaints concerning flagman or flagmen must be resolved in a timely manner. If need for flagman or flagmen is questioned, please contact Railroad's System Engineer of Public Improvements at (404) 529-1641. All verbal complaints must be confirmed in writing by the Contractor within 5 working days with copy to the Department Engineer. Address all written correspondence to:

Office of Chief Engineer-Bridges & Structures
 Attn: System Engineer of Public Improvements
 Norfolk Southern Corporation
 1200 Peachtree St. NE
 Internal Box 142
 Atlanta, GA 30309

The Railroad flagman assigned to the project will be responsible for notifying the Department Engineer upon arrival at the job site on the first day (or as soon thereafter as possible) that flagging services begin and on the last day that he

performs such services for each separate period that services are provided. The Department Engineer will document such notification and general flagging times for verification purposes in the project records. When requested, the Department Engineer will also sign the flagman's diary showing daily time spent and activity at the project site. Also if requested, the flagman will cooperate with the Department by submitting daily timesheets or signing the Department Engineer's diary showing daily time spent at the project site.

8. HAUL ACROSS RAILROADS:

- A. Where the plans show or imply that materials of any nature must be hauled across a Railroad, unless the plans clearly show that the Department has included arrangements for such haul in its agreement with the Railroad, the Contractor will be required to make all necessary arrangements with the Railroad regarding means of transporting such materials across the Railroad. The Contractor will be required to bear all costs incidental, including flagging, to such crossings whether services are performed by his own forces or by Railroad personnel.
- B. No crossing may be established for use of the Contractor for transporting materials or equipment across the tracks of the Railroad unless specific authority for its installation, maintenance, necessary watching and flagging thereof and removal, all at the expense of the Contractor, is first obtained from the Railroad Engineer. The approval process for a temporary private crossing agreement executed between the Contractor and Railroad normally takes 90 days.

9. WORK FOR THE BENEFIT OF THE CONTRACTOR:

- A. All temporary or permanent changes in wire lines or other facilities which are considered necessary to the project are shown on the plans and included in the force account agreement between the Department and the Railroad; or will be covered by appropriate revisions to same which will be initiated and approved by the Department and/or Railroad.
- B. Should the Contractor desire any changes in addition to the above, then he shall make separate arrangements with the Railroad for same to be accomplished at the Contractor's expense.

10. COOPERATION AND DELAYS:

- A. It shall be the Contractor's responsibility to arrange a schedule with the Railroad for accomplishing stage construction involving work by the Railroad or tenants of the Railroad. In arranging his schedule he shall ascertain, from the Railroad, the lead time required for assembling crews and materials and shall make due allowance therefore. The Contractor shall cooperate with others in the construction of the project to the end that all work may be accomplished to the best advantage.

- B. No charge or claims of the Contractor against either the Department or Railroad will be allowed for hindrance or delay on account of railroad traffic, any work done by the Railroad or other delay incident to or necessary for safe maintenance of railroad traffic or for any delays due to compliance with these special provisions.
- C. The Contractor's attention is called to the fact that neither the Department nor Railroad assumes any responsibility for any work performed by others in connection with the construction of the project, and the Contractor shall have no claim whatsoever against the Department, or Railroad for any inconvenience, delay, or additional cost incurred by him on account of such operations by others.

11. TRAINMAN'S WALKWAYS:

Along the outer side of each exterior track of multiple operated tracks, and on each side of single operated track, an unobstructed continuous space suitable for trainman's use in walking along trains, extending to a line not less than 10' from centerline of track, shall be maintained. Any temporary impediments to walkways and track drainage encroachments or obstructions allowed during work hours while Railroad's protective service is provided shall be removed before the close of each work day. If there is any excavation near the walkway, a handrail, with 10'-0" minimum clearance from centerline of track shall be placed.

12. GUIDELINES FOR PERSONNEL ON RAILROAD'S RIGHT OF WAY:

- A. All persons shall wear hard hats. Appropriate eye and hearing protection must be used. Working in shorts is prohibited. Shirts must cover shoulders, back and abdomen. Working in tennis or jogging shoes, sandals, boots with high heels, cowboy and other slip-on type boots is prohibited. Hard-sole, lace-up footwear, zippered boots or boots cinched up with straps which fit snugly about the ankle are adequate. Wearing Safety boots is strongly recommended. In the vicinity of at-grade crossings, it is strongly recommended to wear reflective vests.
- B. No one is allowed within 25' of the centerline of track without specific authorization from the flagman.
- C. All persons working near track while train is passing are to lookout for dragging bands, chains and protruding or shifted cargo.
- D. No one is allowed to cross tracks without specific authorization from the flagman.
- E. All welders and cutting torches working within 25' of track must stop when train is passing.
- F. No steel tape or chain will be allowed to cross or touch rails without permission.

13. GUIDELINES FOR EQUIPMENT ON RAILROAD'S RIGHT OF WAY:

- A. No crane or boom equipment will be allowed to set up to work or park within boom distance plus 15 ft. of centerline of track without specific permission from Railroad Engineer and flagman.
- B. No crane or boom equipment will be allowed to foul track or lift a load over the track without flag protection and track time.
- C. All employees will stay with their machines when crane or boom equipment is pointed toward track.
- D. All cranes and boom equipment under load will stop work while train is passing (including pile driving).
- E. Swinging loads must be secured to prevent movement while train is passing.
- F. No loads will be suspended above a moving train.
- G. No equipment will be allowed within 25' of centerline of track without specific authorization of the flagman.
- H. Trucks, tractors or any equipment will not touch ballast line without specific permission from railroad official and flagman.
- I. No equipment or load movement within 25' or above a standing train or railroad equipment without specific authorization of the flagman.
- J. All operating equipment within 25' of track must halt operations when a train is passing. All other operating equipment may be halted by the flagman if the flagman views the operation to be dangerous to the passing train.
- K. All equipment, loads and cables are prohibited from touching rails.
- L. While clearing and grubbing, no vegetation will be removed from Railroad embankment with heavy equipment without specific permission from the Railroad Engineer and flagman.
- M. No equipment or materials will be parked or stored on Railroad's property unless specific authorization is granted from the Railroad Engineer.
- N. All unattended equipment that is left parked on Railroad's property shall be effectively immobilized so that it cannot be moved by unauthorized persons.
- O. All cranes and boom equipment will be turned away from track after each work day or whenever unattended by an operator.

14. INSURANCE:

- A. In addition to any other forms of insurance or bonds required under the terms of the contract and specifications, the Prime Contractor will be required to provide coverage conforming to the requirements of the Federal-Aid Policy Guide outlined under Title 23 Subchapter G, Part 646A for all work to be performed on Railroad's right of way by carrying insurance of the following kinds and amounts:
- (1) **Commercial General Liability Insurance** having a combined single limit of not less than \$2,000,000 per occurrence for all loss, damage, cost and expense, including attorneys' fees, arising out of bodily injury liability and property damage liability during the policy period. Said policy shall include explosion, collapse, and underground hazard (XCU) coverage, shall be endorsed to name Railroad specified in section 14A2(c) below both as the certificate holder and as an additional insured, and shall include a severability of interests provision.
 - (2) **Railroad Protective Liability Insurance** having a combined single limit of not less than \$2,000,000 each occurrence and \$6,000,000 in the aggregate applying separately to each annual period. If the project involves track over which passenger trains operate, the insurance limits required are not less than a combined single limit of \$5,000,000 each occurrence and \$10,000,000 in the aggregate applying separately to each annual period. Said policy shall provide coverage for all loss, damage or expense arising from bodily injury and property damage liability, and physical damage to property attributed to acts or omissions at the job site.

The standards for the Railroad Protective Liability Insurance are as follows:

- (a) The insurer must be rated A- or better by A.M. Best Company, Inc.
- (b) The policy must be written using one of the following combinations of Insurance Services Office ("ISO") Railroad Protective Liability Insurance Form Numbers:
 - (1) CG 00 35 01 96 and CG 28 31 10 93; or
 - (2) CG 00 35 07 98 and CG 28 31 07 98; or
 - (3) CG 00 35 10 01; or
 - (4) CG 00 35 12 04
- (c) The named insured shall read:

Norfolk Southern Railway Company
 Three Commercial Place
 Norfolk, Virginia 23510-2191
 Attn: Risk Management

- (d) The description of operations must appear on the Declarations, must match the project description in this agreement, and must include the appropriate Department project and contract identification numbers.

The Description and Designation shall read:

Description and Designation: Cleaning and painting structural steel, girder repair, and bearing replacement on existing Bridge No. #350071 on US 74/29 over Southern Railway in Gaston County, North Carolina near Milepost Main 393.34, identified as State Project 17.BP.12.P.5

- (e) The job location must appear on the Declarations and must include the city, state, and appropriate highway name/number.

NOTE: Do not include any references to milepost on the insurance policy.

- (f) The name and address of the prime contractor must appear on the Declarations.
- (g) The name and address of the Department must be identified on the Declarations as the "Involved Governmental Authority or Other Contracting Party."
- (h) Other endorsements/forms that will be accepted are:

Broad Form Nuclear Exclusion – Form IL 00 21
 30-day Advance Notice of Non-renewal or cancellation
 60-day written notice to the Department prior to cancellation or change
 Quick Reference or Index Form CL/IL 240

- (i) Endorsements/forms that are **NOT** acceptable are:

- (1) Any Pollution Exclusion Endorsement except CG 28 31
- (2) Any Punitive or Exemplary Damages Exclusion
- (3) Known injury or Damage Exclusion form CG 00 59
- (4) Any Common Policy Conditions form
- (5) Any other endorsement/form not specifically authorized in section 14A2 (h) above.

- B. If any part of the work is sublet, similar insurance, and evidence thereof as specified in section 14A1 above, shall be provided by or on behalf of the subcontractor to cover its operations on Railroad's right of way. As an alternative, the Prime Contractor may provide insurance for the subcontractor by means of separate and individual policies.
- C. Prior to entry on Railroad's right of way, the original and one duplicate copy of the Railroad Protective Liability Insurance Policy shall be submitted by the Prime Contractor to the Department at the address below for its review and transmittal to the Railroad. In addition, certificates of insurance evidencing the Prime Contractor's and any

subcontractors' Commercial General Liability Insurance shall be issued to the Department and Railroad at the addresses below, and one certified copy of the Prime Contractor and any Subcontractors policy is to be forwarded to the Department for its review and transmittal to the Railroad. All policies and certificates of insurance shall state that the insurance coverage will not be suspended, voided, canceled, or reduced in coverage or limits without (30) days advance written notice to the Department and Railroad. The Railroad will not permit any work on its right of way until it has reviewed and approved the evidence of insurance required herein.

DEPARTMENT:

NCDOT Rail Division
Engineering & Safety Branch
C/O State Railroad Agent
1556 Mail Service Center
Raleigh, NC 27699-1556

RAILROAD:

Risk Management
Norfolk Southern Railway Company
Three Commercial Place
Norfolk, Virginia 23510-2191

- D. The insurance required herein shall in no way serve to limit the liability of Department or its Contractors under the terms of this agreement.
- E. The insurance amounts specified are minimum amounts and the Contractor may carry insurance in larger amounts if he so desires. As to "aggregate limits", if the insurer establishes loss reserves equal to or in excess of the aggregate limit specified in any of the required insurance policies, the Contractor shall immediately notify the Department and shall cease all operations until the aggregate limit is reinstated. If the insurer establishes loss reserves equal to or in excess of one/half of the aggregate limit, the Contractor shall arrange to restore the aggregate limit to at least the minimum amount stated in these requirements. Any insurance policies and certificates taken out and furnished due to these requirements shall be approved by the Department and Railroad as to form and amount prior to beginning work on Railroad's right of way.
- F. All insurance herein before specified shall be carried until the final inspection and acceptance of the project by the Department and Railroad, or acceptance of that portion of the project within Railroad's right of way. At this point, no work or any other activities by the Contractor shall take place in Railroad's right of way without written permission from both the Department and Railroad.

15. TRAIN DATA

Two (2) Tracks
Twenty-eight (28) Trains per Day
60-79 MPH
Freight

16. FAILURE TO COMPLY:

- A. In the event the Contractor violates or fails to comply with any of the requirements of these Special Provisions:
- (1) The Railroad Engineer may require that the Contractor vacate Railroad's property.
 - (2) The Department Engineer may withhold all monies due the Contractor on monthly statements.

Any such orders shall remain in effect until the Contractor has remedied the situation to the satisfaction of the Department Engineer and the Railroad Engineer.

17. PAYMENT FOR COST OF COMPLIANCE:

No separate payment will be made for any extra cost incurred on account of compliance with these special provisions. All such cost shall be included in the various prices bid to perform the work.

18. COMPLETION AND ACCEPTANCE:

Upon completion of the work, the Contractor shall remove from within the limits of the Railroad's right of way all machinery, equipment, surplus materials, rubbish or temporary buildings of the Contractor, and leave said right of way in a neat and orderly condition. After the final inspection has been made and work found to be completed in a satisfactory manner acceptable to the Department and Railroad, the Department will be notified of the Railroad acceptance in writing by the Railroad's Chief Engineer or his authorized representative within ten (10) days or as soon thereafter as practicable

COORDINATION WITH NORFOLK SOUTHERN RAILWAY

The Contractor shall be responsible for coordinating with the Norfolk Southern Railway Corporation, hereafter referred to as "RAILROAD", for right-of-entry onto Railroad property or right-of-way. Coordination shall include but not be limited to the acquisition and handling of right-of-entry agreements. The Contractor shall be responsible for costs associated with all right-of-entry agreement fees.

The standard right-of-entry agreement for Norfolk Southern railroad may be obtained at the following link (Non-Environmental Rights-of-Entry within 50 Feet of a Railroad Track):

http://realestate.nscorp.com/nscrealestate/RealEstate/Real_Estate_Services/Property_Access/;jsessionid=DLG1TnlLJwL5jzzDgB2dfK6NpvprGVLwSgJnGJgrJQvSyDNdh8G6!-1475876309

Preparation for Construction within the Existing Railroad Property or Right-of-Way

The Contractor shall be required to use the following guidelines and other guidelines as required by the Railroad.

- *Norfolk Southern Corporation Special Provisions for Protection of Railway Interest*
- *Federal Aid Policy Guide 23 CFR 140I*
- *Federal Aid Policy Guide 23 CFR 646*
- *NCDOT Standard Specifications for Roads and Structures Section 107-9 (Excluding Paragraph 2)*
- *North Carolina Administrative Code Section T19A: 02B, 0150 through 0158*

Arrangements for Protection and Adjustments to Existing and Proposed Railroad Crossing Surface and Roadbeds:

The Contractor shall make the necessary arrangements with the Railroad for any necessary railroad force account estimates which may include flagging, engineering, and plan review. Force account estimate should be forwarded to the office of the NCDOT State Structures Engineer. The Contractor shall not commence any work on the Railroad property or right-of-way until all agreements have been executed, insurance acquired and approved, and all construction plans for cleaning and painting have been approved by the Railroad Engineer. The Contractor shall make the necessary arrangements with the Railroad that are required to protect against property damage that may result in loss of service, expense, or loss of life. The Contractor shall be responsible for all damage to the Railroad resulting from their operations. The Railroad may issue a stop work order until all dangerous situations are remedied. The Contractor shall be responsible for providing Railroad Protective Liability Insurance for Bodily Injury Liability, Property Damage Liability, and Physical Damage to Property.. Other insurance requirements, including those for all subcontractors, are detailed in the “*Special Provision for Protection of Railroad Interest*”. The Contractor shall be required to use the Standard NCDOT Cost Agreement and Insurance Special Provisions forms, which will be supplied by the NCDOT State Railroad Agent upon request. The Contractor shall submit executed agreements, force account estimate and plans to NCDOT’s State Structures Engineer prior to the commencement of work in the railroad property or right-of-way and prior to authorization for the Railroad to proceed with force account work

Coordination with Norfolk Southern Corporation:

The contractor shall acquire the right-of-entry agreement through the appropriate Local Norfolk Southern Railroad Division Engineer.

The Contractor shall coordinate with J. N. Carter, Jr., Chief Engineer, Bridges and Structures, Norfolk Southern Corporation, 1200 Peachtree Street, N.E., Atlanta, GA 30309-3579, (contact is Scott Overbey at telephone number 404-582-5588) to obtain plan

approval. The Department will be responsible for payment of the Railroad Force Account work up to the indicated ICT; however, the Contractor shall reimburse the Department for Force Account Estimate overruns and other damages that exceed the ICT at the rate indicated.

The plan submittal to the Railroad shall include any working drawings for cleaning and painting girders. All submittals to Railroad shall be made electronically using the pdf format for documents and drawings unless otherwise directed by the Railroad Engineer.

CSX TRANSPORTATION, INC. - RAILROAD SPECIAL PROVISIONS

NOTICE TO THE RAILROAD COMPANY OF START OF WORK:

The Contractor shall notify CSX Transportation, Inc., herein called the Railroad Company, at least thirty (30) days in advance of the date on which he expects to start work on the railroad right-of-way. A written notice is required. No work shall commence on CSXT right-of-way until the Railroad Company has received and approved the Contractor's insurance policy.

RELOCATION OF WIRE LINES:

Any temporary or permanent changes in wire lines necessitated by the construction of the project will be made by others without cost to the Contractor. However, the Contractor will be required to bear the cost of any changes that are made at his request solely for his convenience in the conduct of his operations.

DELAYS CAUSED BY OPERATIONS OF OTHERS:

The Contractor's attention is called to the fact that neither the North Carolina Department of Transportation, herein called the Department of Transportation, nor the Railroad Company assumes any responsibility for any work performed by others in connection with the construction of the project, and the Contractor shall have no claim whatsoever against the Department of Transportation or the Railroad Company for any inconvenience, delay, or additional cost incurred by him on account of such operations by others.

COOPERATION WITH OTHERS:

The Contractor shall cooperate with others participating in the construction of the project to the end that all work may be carried on to the best advantage.

AUTHORITY OF RAILROAD ENGINEER:

The authorized representative of the Railroad Company hereinafter referred to as Railroad Engineer, shall have the final authority in all matters affecting the safe maintenance of railroad traffic of his company.

CONSTRUCTION CORRESPONDENCE AND SUBMITTALS:

Initially, direct all construction related correspondence to the Philadelphia AECOM office, CSXT's General Engineering Contractor. The Philadelphia office address is:

Mr. Brian V. Harrison, PE
AECOM
1700 Market Street
Suite 1600
Philadelphia, PA 19103

And a copy to:

Clyde Gray
CSX Transportation
1610 Forest Avenue
Suite 120
Richmond, VA 23229

All required construction submittals shall be forwarded to and approved in writing by the Railroad Company prior to proceeding with construction of each applicable phase. Thirty (30) days will be required to review all construction submittals. An additional thirty (30) day will be required to review any subsequent submissions returned not approved.

EMERGENCY ACTION PLAN:

The Contractor shall develop and submit an emergency action plan indicating the location of the site, contact names and phone numbers, access to the site, instructions for emergency response, and location of the nearest hospitals. The plan shall also cover the Contractor's means of fire suppression that may include the phone number and location of the nearest fire department. The plan shall cover all items required in the event of an emergency at the site.

CONSTRUCTION SCHEDULE:

The Contractor shall prepare and submit a detailed construction schedule for the duration of the project clearly indicating the time periods while working on and around CSXT right-of-way.

INTERFERENCE WITH RAILROAD OPERATIONS:

The Contractor shall so arrange and conduct his work that there will be no interference with railroad operations, including train, signal, telephone and telegraphic services, or damage to the property of the Railroad Company or to the poles, wire, and other facilities of tenants on the rights-of-way of the Railroad Company. Wherever work is liable to affect the operations or safety of trains, the method of doing such work shall first be submitted to the Railroad Engineer for approval, but such approval shall not relieve the Contractor from liability.

Should conditions arising from or in connection with the work, require that immediate and unusual provisions be made to protect train operations and property of the Railroad Company, it shall be a part of the required services by the Contractor to make such provisions and if, in the judgement of the Railroad Engineer such provisions is insufficient, the Railroad Engineer or the Highway Engineer, may at the expense of the Contractor, require or provide such provisions as may be deemed necessary.

The Contractor will not be permitted to provide less than the following temporary clearances during construction of the proposed overhead bridge:

15'-0" horizontal clearance measured to track from centerline of track to falsework.

23'-0", or no less than existing vertical clearance from top of rail to falsework. Any temporary reduction in vertical clearance must be requested in writing for further review and approval by the Railroad.

STRUCTURE EXCAVATION AND SHORING:

The Contractor shall furnish evidence to the Department of Transportation and the Railroad Company that, upon starting construction of the proposed grade separation structure, he shall expedite the excavation and bridge work continuously and diligently to completion.

The Contractor will be required to take special precaution and care in connection with excavating and shoring pits, and in driving piles, for highway bridge footings adjacent to track to provide adequate lateral support for the track and loads which it carries without disturbance of track alignment and service, and to avoid obstructing track clearances with working equipment, tools or other material. The procedure for doing such work, including need of and plans for shoring, shall first be approved by the Railroad, but such approval shall not relieve the contractor from liability.

Shoring or sheeting protection shall be provided when excavating adjacent to an active railroad track, except as noted below.

Shoring will not be required if both the following conditions are satisfied:

1. Excavation does not encroach upon a 1½ horizontal: 1 vertical theoretical slope line starting 1'-6" below top of rail and at 12'-0" minimum from centerline of the track.
2. Track is on level ground or in a cut section and on stable soil.

When track is on embankment, excavating the toe of embankment without shoring may affect the stability of the embankment. Therefore, excavation of embankment toe without shoring will not be permitted.

Preferred protection is the cofferdam type that completely encloses the excavation. Where dictated by conditions, partial cofferdams with open sides away from the track may be used. Cofferdams shall be constructed using steel sheet piling or steel soldier beams with timber lagging. Wales and struts shall be provided as needed. The following shall be considered when designing cofferdams:

- a. Sheeting shall be designed to resist a vertical live load surcharge of 1800 lbs per square foot, in addition to active earth pressure. The surcharge shall be assumed to act on a continuous strip, 8'-6" wide. Lateral pressures due to surcharge shall be computed using the strip load formula shown in A.R.E.M.A. specifications, Chapter 8, Part 20.
- b. Allowable stresses in materials shall be in accordance with A.R.E.M.A. Specifications, Chapter 7, 8, and 15.

- c. A construction procedure for temporary shoring shall be shown on the drawing.
- d. Safety railing shall be installed when temporary shoring is within 12 feet of track.
- e. A minimum distance of 10 feet from centerline of the track to face of sheeting shall be maintained.

The Contractor shall submit the following drawings and calculations for Railroad review and approval.

- 1. Three (3) sets of detailed drawings of the shoring systems showing sizes of all structural members, details of connections, and distances from centerline of track to face of shoring. Drawing shall show a section showing height of sheeting and track elevation in relation to bottom of excavation.
- 2. One set of calculations of the cofferdam design prepared in accordance with CSXT's Criteria for Overhead Bridges dated September 14, 2007. The drawings and calculations shall be prepared by a North Carolina Registered Professional Engineer experienced in the design of shoring and cofferdams and shall bear his seal and signature.

The subgrade of an operated track shall be maintained with edge of berm at least 10' from centerline of track and not more than 24" below top of rail. Unless so indicated on the plans the Contractor will not be required to make the existing section meet this specification and if substandard, the existing section will be maintained.

DEMOLITION OF EXISTING STRUCTURE:

Railroad tracks shall be protected from damage during demolition of existing structure or replacement of deck slab.

During demolition of the deck, a protection shield shall be erected over the track to catch falling debris. The protection shield shall be supported from girders or beams and shall not be lower than allowed temporary clearance. The deck shall be removed by cutting it in sections and lifting out. All cranes and hardware used in picks is to account for a 150% Factor of Safety. Factor of safety implied in crane charts is not to be considered in determination of lifting capacity. Large pieces of deck shall not be allowed to fall on protection shield.

Blasting will not be permitted to demolish a structure over or within railroad right-of-way.

The Contractor shall submit detailed demolition plans, including protection shield details to the Railroad Engineer for approval prior to the start of demolition. The plans shall also indicate the location and capacity of the proposed cranes and estimated lifting loads. The plans shall be prepared by a North Carolina Registered Professional Engineer and shall bear his seal and signature.

BLASTING:

Explosives shall not be used adjacent to any track or other railroad property without the advance approval of the Highway Engineer and the Railroad Engineer, but such approval will not relieve the Contractor of any liability. If use of explosives is permitted, the blasting shall be done with light charges under the direct experienced supervision of a responsible officer or employee of the Contractor, or of the Department of Transportation. Electric detonating fuses or charges shall not be used on account of possible premature explosions resulting from operation of 2-way train radios. Every precaution shall be taken to avoid damage to property, injury to persons and interruption of railroad operations.

No blasting shall be done without an authorized Railroad representative present, who will determine the approximate location of trains in order that the Contractor can be certain whether or not sufficient time will be available for blasting and subsequent cleanup without delaying trains. The Contractor shall notify the Railroad Engineer at least 10 days in advance of blasting to permit arrangement for the presence of an authorized Railroad representative and such flagging service as may be deemed necessary.

The Contractor shall have adequate equipment, labor, and materials at the job site and provide sufficient time to clean up the debris resulting from the blasting without delay to trains. He will at his expense correct any track misalignment or other damage to railroad property resulting from the blasting as directed by the Railroad Engineer. If his actions result in delays to trains, the Contractor shall bear the entire cost thereof.

Blasting shall be discontinued immediately upon notice by the Railroad Engineer or the Highway Engineer that it is too hazardous.

STORAGE OF MATERIALS:

Materials and equipment shall not be stored where they will interfere with railroad operations, nor on the rights-of-way of the Railroad Company without first having obtained permission from the Railroad Engineer, and such permission will be with the understanding that the Railroad Company will not be liable for damage to such material and equipment from any cause and that the Railroad Engineer may move or require the Contractor to move, at the Contractor's expense, such material and equipment.

DAMAGES:

The Contractor shall assume all liability for any and all damages to his work, employees, servants, equipment and materials caused by railroad traffic.

MAINTENANCE OF DITCHES ADJACENT TO RAILROAD TRACKS:

The Contractor shall submit plans indicating the proposed methods of erosion control during construction, in particular, excavation for the piers and grading.

The Contractor shall exercise necessary precautions to prevent fouling of track ballast and existing ditches in the excavation of material at the proposed structure site. He shall maintain the existing railroad ditches free from obstruction and silt through the duration of his construction operations and upon completion of the structure shall leave the ditches in conditions satisfactory to the Railroad Engineer.

Should material from excavating at the proposed structure site foul the track ballast, the Contractor will be required to clean or replace the fouled ballast under the direction of and to the satisfaction of the Railroad Engineer.

Any cost incurred by the Railroad Company for repairing damage to its property or to property of its tenants, caused by or resulting from the operations of the Contractor, shall be paid by the Contractor to the Railroad Company.

TEMPORARY RAILROAD GRADE CROSSINGS:

Where the plans show or imply that equipment or materials of any nature must be transported across a Railroad, unless the Department of Transportation has included arrangements for such crossings in its agreement with the Railroad, the Contractor will be required to first obtain authority for its installation, maintenance, and removal from the Railroad Engineer. The Contractor shall execute CSX Railroad's standard private road crossing agreement. Railroad Forces will do all work within two feet of the rail and the Contractor will pay all cost associated with the installation, maintenance and removal of the temporary grade crossing. The Contractor shall arrange for any resulting necessity of watching and flagging and to furnish the Railroad Company with a separate Railroad Protective Liability Policy other than the one required by these special provisions. All the above shall be at no cost to the Department of Transportation.

In the event the Department of Transportation has made arrangements for the Temporary Grade Crossings, the Contractor will need to have a railroad flagman on site during any use of the crossing and the crossings must be physically barricaded during such times that it is not required for use. The Contractor shall construct the road and approaches such that it does not interrupt existing drainage patterns and to the satisfaction of the Railroad. Flagman must be on site for construction and the roadway must be removed upon completion of the project. The Contractor shall restore the property including any drainage ditches. The Contractor's attention is called to the fact that he will not be required to bear the cost of the flagging services required by the Railroad Company or provide any additional railroad insurance except that required by the Insurance Special Provision.

ERECTION PROCEDURE:

The Contractor shall submit a detailed procedure for erecting the spans over railroad tracks. Equipment used for the erection, or removal of structures over railroad facilities, shall have a minimum lifting capacity of one hundred-fifty percent (150%). Factor of safety implied in crane charts is not to be considered in determination of lifting capacity. The procedure shall indicate the capacity of cranes, location of cranes with respect to the tracks and estimated lifting loads. The erection procedure must follow CSX Construction Guidelines and be prepared by a

North Carolina Registered Professional Engineer and shall bear his seal and signature. The procedure must be approved by the Railroad.

FLAGGING PROTECTION OR WATCHMAN SERVICE:

The watchman and flagging service required by the Railroad Company for the safety of railroad operations because of work performed by the Contractor or subcontractors in connection with the construction of the proposed overhead bridge will be provided by CSX Transportation, Inc. and the Contractor's special attention is called to the fact that he will not be required to bear the cost of any watchman or flagging service required by CSX Transportation, Inc., other than that required at any temporary grade crossing, as the Railroad Company will be reimbursed by the Department of Transportation on bills rendered monthly. All bills to be prepared in accordance with the Federal-Aid Policy Guide 23 CFR 646B.

When the Contractor's men or equipment are working within eighteen (18) feet of the nearest rail, over, under or adjacent to the track over which trains are operated, or when work is being performed adjacent to an operated track which may present a hazard to train operations, or when equipment is being used which does, or may infringe on such limits, and at other times, when in the opinion of the Railroad Engineer such protection is necessary, the services of a man or men will be used for flagman or watchman service.

The Contractor shall give 10 days advance notice to the Railroad Engineer in order that flagging service can be arranged and provided. No work shall be undertaken until the flagman, or flagmen, are at the job site. The estimated number and classification of men are shown in the Force Account Estimate.

The estimated cost of Flagging Protection or Watchman Service is shown in the Force Account Estimates prepared by CSX Transportation, Inc., and made a part of the Plans, Specifications and Estimate.

If the Railroad Company for any reason finds it necessary to furnish a watchman or flagman of a different classification from that shown in the Force Account Estimate, bills will be rendered and shall be paid on the basis of the rate of pay for the men used whether that is above or below the rate given. If the rate of pay of any employee that is to be used for watchman or flagging service is changed before the work is started or during the progress of the work, either by law or agreement between the Railroad Company and its employees, or if the tax rates on labor are changed, bills will be rendered by the Railroad Company and paid by the Department of Transportation on the new rates.

The Contractor's attention is also called to the fact that he will be required to carry on his operations which require flagging protection or watchman service in such a manner and sequence that the cost of such will be as economical as possible.

COMPLETION AND ACCEPTANCE OF WORK:

Upon completion of the work, the Contractor shall remove from within the limits of the railroad right of way all machinery, equipment, surplus materials, rubbish or temporary buildings of the Contractor, and leave said rights-of-way in a neat and orderly condition. After the final inspection has been made and work found to be completed in a satisfactory manner acceptable to the Department of Transportation and the Railroad Company, the Department of Transportation will be notified of the Railroad Company's acceptance in writing by the Railroad Engineer within ten (10) days or as soon thereafter as practicable.

At project completion, a complete set of "As Built" plans for the proposed construction shall be submitted to CSXT Bridge Maintenance and Design Group. CSXT will keep these plans on file in Jacksonville for future reference. Please address these plans to:

Mr. Rick Garro
500 Water Street
J-350
Jacksonville, FL 32202

INSURANCE SPECIAL PROVISIONS FOR

CSX TRANSPORTATION, INC.

STRUCTURE MAINTENANCE

WBS 17BP.12.P.5

Catawba County

A. In addition to any other forms of insurance or bonds required elsewhere in the contract documents, the Contractor will be required to provide coverage conforming to the requirements of the Federal-Aid Policy Guide outlined under 23 CFR 646A for all work to be performed on Railroad right(s)-of-way under the terms of the contract by carrying insurance of the following kinds:

1. CONTRACTOR'S COMMERCIAL GENERAL LIABILITY INSURANCE:

a. The Contractor shall furnish an original and one copy of the certificates of insurance and one certified copy of the policy to the Department of Transportation as evidence that, with respect to the operations he performs on railroad right-of-way, he carries Commercial General Liability Insurance including "XCU" coverage providing for limits of liability as follows:

<u>COVERAGE</u>	<u>MINIMUM COMBINED LIMITS OF LIABILITY</u>
Bodily Injury Liability	\$ 5,000,000 Per Occurrence
Property Damage Liability	\$ 5,000,000 Aggregate

b. If any part of the work is sublet, similar insurance and evidence thereof in the same amounts as required of the Prime Contractor, shall be provided by the subcontractor to cover his operations on railroad right-of-way. As an alternative, the Prime Contractor may provide insurance for the subcontractor by means of separate and individual policies.

c. Certificates of Insurance holders are to be sent to the addressees given below. Certificates shall make reference to the project, milepost and county.

NCDOT Rail Division
Engineering & Safety Branch
c/o State Railroad Agent
1556 Mail Service Center
Raleigh, N.C. 27699-1556

CSX Transportation, Inc.
Risk Manager
500 Water Street
Jacksonville, Florida
32202

2. RAILROAD PROTECTIVE LIABILITY INSURANCE:

- a. The Contractor shall furnish to the Department of Transportation an original and one duplicate of the Railroad Protective Liability Insurance Policy with limits of liability as follows:

<u>COVERAGE</u>	<u>MINIMUM COMBINED LIMITS OF LIABILITY</u>
Bodily Injury Liability	\$5,000,000 Per Occurrence
Property Damage Liability	\$10,000,000 Aggregate Per Annual Policy Period
Physical Damage to Property	

- b. The Railroad Protective Liability Policy is to be written on the ISO/RIMA Form No. CG 00 35 10 93 (or updates thereof) including Endorsements CG 28 31 11 85 and IL 00 21 or their equivalents.
- c. The insurer must be financially stable and rated A- or better in A.M. Best & Company’s Insurance Reports.
- d. The name and address of Contractor and Department of Transportation must be shown on the Declarations page.
- e. The named insured, description of the work and designation of the job site to be shown on the Policy are as follows:

Named Insured: CSX Transportation, Inc.
 Casualty Insurance Department (J-907)
 500 Water Street
 Jacksonville, Florida 32202

Description and Designation: Cleaning and painting structural steel, girder repair, and bearing replacement on existing Bridge No. #170099 located on NC 150 over the Seaboard Coastline RR near Lake Norman in Catawba County, North Carolina near Milepost Main SFE 22.22, identified as State Project 17.BP.12.P.5

Train Data
 Freight
 One track
 3 trains
 25mph

- B. The Railroad Protective Liability Policy shall contain a clause requiring that sixty (60) days written notice be given the Department of Transportation and the Railroad Company prior to cancellation or change.

All other policies and certificates shall contain a clause requiring that thirty (30) days written notice be given to the Department of Transportation and the Railroad Company

prior to cancellation or change. The notices shall make reference to the project, milepost and county.

NOTICE TO:

Jonathan MacArthur
 Insurance Department
 CSX Corporation
 500 Water Street - C907
 Jacksonville, FL 32202
 904.359.3394 (Phone)
 904.306.5325 (Fax)
Jonathan_MacArthur@csx.com

COPY NOTICE TO:

NCDOT Rail Division
 Engineering & Safety Branch
 c/o State Railroad Agent
 1556 Mail Service Center
 Raleigh, N. C. 27699-1556

- C. All insurance herein before specified shall be carried until the final inspection and acceptance of the project, or that portion of the project within railroad right-of-way, by the Department of Transportation or, in the case of subcontractors, until the Contractor furnishes a letter to the Engineer stating that the subcontractor has completed his subcontracted work within railroad right-of-way to the satisfaction of the Contractor and that the Contractor will accomplish any additional work necessary on railroad right-of-way with his own forces. It is understood that the amounts specified are minimum amounts and that the Contractor may carry insurance in larger amounts if he so desires. As to "aggregate limits", if the insurer establishes loss reserves equal to or in excess of the aggregate limit specified in any of the required insurance policies, Contractor shall immediately notify the Department of Transportation and shall cease all operations until the aggregate limit is reinstated. If the insurer establishes loss reserves equal to or in excess of one/half of the aggregate limit, Contractor shall arrange to restore the aggregate limit to at least the minimum amount stated in these requirements. Any insurance policies and certificates taken out and furnished due to these requirements shall be approved by the Department of Transportation and the Railroad Company as to form and amount prior to beginning work on railroad right-of-way.

No extra allowance will be made for the insurance required hereunder; the entire cost of same is to be included in the unit contract price bids for the several pay items.

- D. Evidence of insurance as required above shall be furnished for review to the Department of Transportation at the address shown below after which it will be forwarded by the Department of Transportation to the Railroad.

Send to Department:

NCDOT Rail Division
Engineering & Safety Branch
c/o State Railroad Agent
1556 Mail Service Center
Raleigh, NC 27699-1556