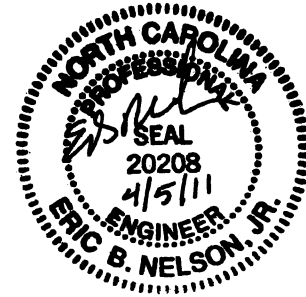


**PROJECT SPECIAL PROVISIONS****SCOPE OF WORK****Description of Work**

This work shall consist of furnishing all labor, materials and equipment to make structural steel repairs to the webs, bottom flanges, stiffener/connector plates; modify the bent diaphragms to allow jacking of the spans and replace existing steel bearings with elastomeric bearings for Edgecombe county Bridge #104; and clean and paint the structural steel of Edgecombe county Bridge #104, Franklin County Bridge #11 and Nash County Bridge #154 and #169 as shown in the contract documents and plans. Contractor shall provide all necessary access; underdeck platforms, scaffolding, ladders, etc.; provide all traffic control; provide all staging area, material storage, boat storage and boat access; provide environmental controls to limit loss of materials into water and air; jacking equipment, sawing equipment, and chipping equipment; and all else necessary to complete the work.

The contractor shall be responsible for fulfilling all requirements of the NCDOT Standard Specifications for Roads and Structures dated July 2006, except as otherwise specified herein.

**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**

**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.

**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.

**Crane Inspections:** Inspection records for all cranes shall be current and readily accessible for review upon request.

**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.

**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 State Bridge Management Unit.

**Addresses and Contacts**

Mr. Rick Nelson, PE Asst. State Bridge Management Engineer NC Dept. of Transportation State Bridge Management Unit 4809 Beryl Drive Raleigh, NC 27606 Fax: 919.733.2348 Ph: 919.733.4362 Email: enelson@ncdot.gov	Mr. Aaron Dacey Coatings & Corrosion Engineer NC Dept. of Transportation Materials & Tests Unit 1563 Mail Service Center 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 State Bridge 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**

<b>Submittal</b>	<b>Copies Required by SBMU</b>	<b>Copies Required by Materials&amp;Tests</b>	<b>Contract Reference Requiring Submittal</b>
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 AND FORMWORK**

(8-4-09)

**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.

**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.

**Design Requirements****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.

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.

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

**Wind Loads:**

Table 2.2 of Article 2.2.5.1 is modified to include wind velocities up to 110 mph (177 km/hr). 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 (m) above ground	Pressure, lb/ft <sup>2</sup> (kPa) for Indicated Wind Velocity, mph (km/hr)				
	70 (112.7)	80 (128.7)	90 (144.8)	100 (160.9)	110 (177.0)
0 to 30 (0 to 9.1)	15 (0.72)	20 (0.96)	25 (1.20)	30 (1.44)	35 (1.68)
30 to 50 (9.1 to 15.2)	20 (0.96)	25 (1.20)	30 (1.44)	35 (1.68)	40 (1.92)
50 to 100 (15.2 to 30.5)	25 (1.20)	30 (1.44)	35 (1.68)	40 (1.92)	45 (2.15)
over 100 (30.5)	30 (1.44)	35 (1.68)	40 (1.92)	45 (2.15)	50 (2.39)

**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) (km/hr)	COUNTY	25 YR (mph) (km/hr)	COUNTY	25 YR (mph) (km/hr)
Alamance	70 (112.7)	Franklin	70 (112.7)	Pamlico	100 (160.9)
Alexander	70 (112.7)	Gaston	70 (112.7)	Pasquotank	100 (160.9)
Alleghany	70 (112.7)	Gates	90 (144.8)	Pender	100 (160.9)
Anson	70 (112.7)	Graham	80 (128.7)	Perquimans	100 (160.9)
Ashe	70 (112.7)	Granville	70 (112.7)	Person	70 (112.7)
Avery	70 (112.7)	Greene	80 (128.7)	Pitt	90 (144.8)
Beaufort	100 (160.9)	Guilford	70 (112.7)	Polk	80 (128.7)
Bertie	90 (144.8)	Halifax	80 (128.7)	Randolph	70 (112.7)
Bladen	90 (144.8)	Harnett	70 (112.7)	Richmond	70 (112.7)
Brunswick	100 (160.9)	Haywood	80 (128.7)	Robeson	80 (128.7)
Buncombe	80 (128.7)	Henderson	80 (128.7)	Rockingham	70 (112.7)
Burke	70 (112.7)	Hertford	90 (144.8)	Rowan	70 (112.7)
Cabarrus	70 (112.7)	Hoke	70 (112.7)	Rutherford	70 (112.7)
Caldwell	70 (112.7)	Hyde	110 (177.0)	Sampson	90 (144.8)
Camden	100 (160.9)	Iredell	70 (112.7)	Scotland	70 (112.7)
Carteret	110 (177.0)	Jackson	80 (128.7)	Stanley	70 (112.7)
Caswell	70 (112.7)	Johnston	80 (128.7)	Stokes	70 (112.7)
Catawba	70 (112.7)	Jones	100 (160.9)	Surry	70 (112.7)
Cherokee	80 (128.7)	Lee	70 (112.7)	Swain	80 (128.7)
Chatham	70 (112.7)	Lenoir	90 (144.8)	Transylvania	80 (128.7)
Chowan	90 (144.8)	Lincoln	70 (112.7)	Tyrell	100 (160.9)
Clay	80 (128.7)	Macon	80 (128.7)	Union	70 (112.7)

Cleveland	70 (112.7)	Madison	80 (128.7)	Vance	70 (112.7)
Columbus	90 (144.8)	Martin	90 (144.8)	Wake	70 (112.7)
Craven	100 (160.9)	McDowell	70 (112.7)	Warren	70 (112.7)
Cumberland	80 (128.7)	Mecklenburg	70 (112.7)	Washington	100 (160.9)
Currituck	100 (160.9)	Mitchell	70 (112.7)	Watauga	70 (112.7)
Dare	110 (177.0)	Montgomery	70(112.7)	Wayne	80 (128.7)
Davidson	70 (112.7)	Moore	70 (112.7)	Wilkes	70 (112.7)
Davie	70 (112.7)	Nash	80 (128.7)	Wilson	80 (128.7)
Duplin	90 (144.8)	New Hanover	100 (160.9)	Yadkin	70 (112.7)
Durham	70 (112.7)	Northampton	80 (128.7)	Yancey	70 (112.7)
Edgecombe	80 (128.7)	Onslow	100 (160.9)		
Forsyth	70 (112.7)	Orange	70 (112.7)		

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, metallize or otherwise protect these devices as directed by the Engineer. Any coating required by the Engineer will be considered incidental to the various pay items requiring temporary works.

### 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.

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.

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.

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

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. 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. 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.

### 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 (25 mm). 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.

**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.

**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.

**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.

**Method of Measurement**

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

**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.

**ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS**

(6-11-07)

**General**

Installation and Testing of Adhesively anchored anchor bolts and dowels shall be in accordance with Section 420-13, 420-21 and 1081-1 of the Standard Specifications except as modified in this provision.

**Installation**

Installation of the adhesive anchors shall be in accordance with manufacturer's recommendations and shall occur when the concrete is above 40 degrees Fahrenheit and has reached its 28 day strength.

The anchors shall be installed before the adhesive's initial set ('gel time').

**Field Testing**

Replace the third paragraph of Section 420-13 (C) with the following:

"In the presence of the Engineer, field test the anchor bolt or dowel in accordance with the test level shown on the plans and the following:.

Level One Field testing: Test a minimum of 1 anchor but not less than 10% of all anchors to 50% of the yield load shown on the plans. If less than 60 anchors are to be installed, install and test the required number of anchors prior to installing the remaining anchors. If more than 60 anchors are to be installed, test the first 6 anchors prior to installing the remaining anchors, then test 10% of the number in excess of 60 anchors.

Level Two Field testing: Test a minimum of 2 anchors but not less than 10% of the all anchors to 80% of the yield load shown on the plans. If less than 60 anchors are to be installed, install and test the required number of anchors prior to installing the remaining anchors. If more than 60 anchors are to be installed, test the first 6 anchors prior to installing the remaining anchors, then test 10% of the number in excess of 60 anchors.

Testing should begin only after the Manufacturer's recommended cure time has been reached. For testing, apply and hold the test load for three minutes. If the jack experiences any drop in gage reading, the test must be restarted. For the anchor to be deemed satisfactory, the test load must be held for three minutes with no movement or drop in gage reading."

**Removal and Replacement of Failed Test specimens:**

Remove all anchors and dowels that fail the field test without damage to the surrounding concrete. Redrill holes to remove adhesive bonding material residue and clean the hole in accordance with specifications. For reinstalling replacement anchors or dowels, follow the same procedures as new installations. Do not reuse failed anchors or dowels unless approved by the Engineer.

**Usage**

The use of adhesive anchors for overhead installments is not permitted without written permission from the Engineer.

**Basis of Payment**

No separate measurement or payment will be made for furnishing, installing, and testing anchor bolts/dowels. Payment at the contract unit prices for the various pay items will be full compensation for all materials, equipment, tools, labor, and incidentals necessary to complete the work.

**SPAN JACKING****SPECIAL****Scope of Work**

Work includes jacking the bridge at the bents to remove existing bearings, drilling anchor bolt holes in the bent caps, and installing new anchor bolts and bearings. Install blocking while the bridge is in the raised condition. While in the raised condition, remove existing steel bearings; install sole plates and elastomeric bearing pads. Prior to bridge jacking, complete all diaphragm modifications at the pier being jacked as required in the plans. Jack all girders in a span on one side of the bent (or end bent) simultaneously.

**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.

**Basis of Payment**

*Span Jacking Bridge #104* will be paid for at the contract price bid for each and will be full compensation for all materials, shop drawings, equipment, tools, labor, and incidentals necessary to jack the bridge.

*Elastomeric Bearings* will be paid for in accordance with Section 430 of the *Standard Specifications*.

Payment will be made under:

**Pay Item**

Span Jacking Bridge #104

**Pay Unit**

Each

**DIAPHRAGM MODIFICATION****General**

Modify the steel diaphragms at End Bent 1, Bent 3, Bent 6 and End Bent 2 as shown on the plans in preparation for jacking.



**Scope of Work**

Work for diaphragm modification includes removal of existing steel diaphragm members, fabrication and installation of proposed steel members, and all welding, drilling and bolting required to install the components. Welding shall be performed by certified welders as specified in the Standard Specifications.

**Basis of Payment**

*Diaphragm Modification Bridge #104* will be paid for at the contract price bid for the actual pounds structural steel used for diaphragm modifications that have been satisfactorily completed and accepted. Such payment will be full compensation for all materials, fabrication, bolting, welding, equipment, tools, labor, and incidentals necessary to complete the work.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Diaphragm Modification Bridge #104	Pound

**GIRDER REPAIR****General**

Cut and remove severely deteriorated bottom flange and web of girders above the bearings or plate over moderately deteriorated flanges and webs of girders at the locations indicated in the plans. The Engineer will determine the extent of the section to be removed on a per girder basis. Prepare web, bearing stiffeners and or connector plates, and bottom flange for welding proposed replacement section as shown on the plans. Weld new sections in place. Welding shall be performed by certified welders and in accordance with the *Standard Specifications*.

**Field Alterations**

Since this repair involves working with an existing structure where dimensions may vary throughout the structure, the contractor should expect and shall be prepared to make alterations in the field. This includes, but is 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.

**Basis of Payment**

*Girder Repair Bridge #104* will be paid for at the contract price bid for actual pounds structural steel used for girder repairs that have been satisfactorily completed and accepted. Such payment will be full compensation for all materials, fabrication, bolting, cutting, welding, equipment, tools, labor, and incidentals necessary to complete the work.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Girder Repair Bridge #104	Pound

**HIGH STRENGTH BOLTS****(5-25-10)**

The 2006 Standard Specifications shall be revised as follows:

In Section **440-8(A) - General**, revise the third paragraph and insert a new paragraph four, respectively, as follows:

Make sure that plain bolts and washers have a thin coat of lubricant at the time of installation.

Use nuts that are pre-waxed by the producer/supplier prior to shipping to the project.

In Section **440-8(D) – Inspection** replace the first sub-paragraph under the third paragraph with the following:

At least once each working day, place 3 calibration sample bolts of the same grade, size, representative length, and conditions as those under inspection in a tension indicating calibration device. Furnish a tension indicating calibration device certified by an approved independent testing lab within 12 calendar months prior to testing the bolts under inspection. The calibration device should be in good working order and provide accuracy within plus or minus 10 percent for the range of loads between 25,000 and 40,000 pounds. Place a washer under the part turned in tightening for each bolt if washers are so used in the structure. If no washer is used make sure that the material abutting the part turned is the same as that used in the structure.

**DIRECT TENSION INDICATORS****(6-12-09)**

The 2006 Standard Specifications shall be revised as follows:

Replace Section **440-8(C)(6) – Direct Tension Indicators** with the following:

Supply direct tension indicators in accordance with the requirements of ASTM F959 and Article 1072-7.

Furnish the Engineer with at least one metal feeler gage for each container of direct tension indicators shipped before beginning installation.

Make sure that the lot number on the containers of direct tension indicators is for the same lot number tested as indicated on the test documents.

Furnish to the Engineer three samples of load indicating washers from each lot number, each size and type for tests and two each of the metal feeler gages required for performing the tests.

Install the direct tension indicator under the bolt head. If it is necessary to install the direct tension indicator under the nut, or if the bolt head shall be turned, install additional hardened washers between the nut or bolt head and the direct tension indicator.

Provide a tension indicating device on the project for determining the tension imposed on a fastener when the protrusions on direct tension indicator are properly compressed.

Test 3 samples from each lot of direct tension indicators in the presence of the Engineer. Achieve a minimum bolt tension of 5% greater than that required by Table 440-1 of Article 440-8.

Do not substitute direct tension indicators for hardened steel washers required with short slotted or oversized holes. If desired, use direct tension indicators in conjunction with hardened steel washers.

Install direct tension indicators initially to a snug tight condition as specified in Subarticle 440-8(C)(3). After initial tightening, fully tighten beginning at the most rigid part of the joint and continuing toward its free edges.

For tightening fasteners containing direct tension indicators, use a clean and lubricated wrench. Maintain air supply and hoses in good condition and provide air pressure of at least 100 psi at the wrench.

When tightening the fasteners, ensure that the part of the fastener being restrained from turning does not rotate during the tightening process. Ensure that no portion of the direct tension indicator protrusions is accidentally partially flattened before installing in the structural steel joints.

Do not reuse direct tension indicators. If it is necessary to loosen a bolt previously tensioned, discard and replace the direct tension indicator.

## **GROUT FOR STRUCTURES**

7-12-07

### **DESCRIPTION**

This special provision addresses grout for use in structures, including continuous flight auger (CFA) piles, micropiles, soil nail and anchored retaining walls and backfilling crosshole sonic logging (CSL) tubes or grout pockets, shear keys, dowel holes and recesses for cored slabs and box beams. This provision does not apply to grout placed in post-tensioning ducts for bridge beams, girders, or decks. Provide grout composed of portland cement, water and at the Contractor's option, fine aggregate and/or pozzolan. If necessary, use set controlling admixtures. Proportion, mix and place grout in accordance with the plans, the applicable section of the *Standard Specifications* or special provision for the application and this provision.

### **MATERIALS**

Refer to Division 10 of the *Standard Specifications*:

<b>Item</b>	<b>Article</b>
Portland Cement	1024-1
Water	1024-4
Fine Aggregate	1014-1
Fly Ash	1024-5
Ground Granulated Blast Furnace Slag	1024-6
Admixtures	1024-3

At the Contractor's option, use an approved packaged grout in lieu of the materials above with the exception of the water. Contact the Materials and Tests (M&T) Unit for a list of approved packaged grouts. Consult the manufacturer to determine if the packaged grout selected is suitable for the application and meets the compressive strength and shrinkage requirements.

**REQUIREMENTS**

Unless required elsewhere in the Contract, provide non-metallic grout with minimum compressive strengths as follows:

<b>Property</b>	<b>Requirement</b>
Compressive Strength @ 3 days	2500 psi (17.2 MPa)
Compressive Strength @ 28 days	4500 psi (31.0 MPa)

For applications other than micropiles, soil nails and ground anchors, use non-shrink grout with shrinkage of less than 0.15%.

When using approved packaged grout, a grout mix design submittal is not required. Submit grout mix designs in terms of saturated surface dry weights on M&T Form 312U in accordance with the applicable section of the *Standard Specifications* or special provision for the structure. Use an approved testing laboratory to determine the grout mix proportions. Adjust proportions to compensate for surface moisture contained in the aggregates at the time of mixing. Changes in the saturated surface dry mix proportions will not be permitted unless a revised grout mix design submittal is accepted.

For each grout mix design, provide laboratory test results for compressive strength, density, flow and if applicable, aggregate gradation and shrinkage. Submit compressive strength for at least 3 cube and 2 cylinder specimens at the age of 3, 7, 14 and 28 days for a total of at least 20 specimens tested. Perform laboratory tests in accordance with the following:

<b>Property</b>	<b>Test Method</b>
Compressive Strength	AASHTO T106 and T22
Density	AASHTO T133
Flow for Sand Cement Grout	ASTM C939 (as modified below)
Flow for Neat Cement Grout (no fine aggregate)	Marsh Funnel and Cup API RP 13B-1, Section 2.2
Aggregate Gradation for Sand Cement Grout	AASHTO T27
Shrinkage for Non-shrink Grout	ASTM C1090

When testing grout for flow in accordance with ASTM C939, modify the flow cone outlet diameter from ½ to ¾ inch (13 to 19 mm).

When grout mix designs are submitted, the Engineer will review the mix designs and notify the Contractor as to their acceptability. Do not use grout mix designs until written acceptance has been received. Acceptance of grout mix designs or use of approved packaged grouts does not relieve the Contractor of responsibility to furnish a product that meets the Contract requirements.

Upon written request from the Contractor, a grout mix design accepted and used satisfactorily on a Department project may be accepted for use on other projects.

**SAMPLING AND PLACEMENT**

The Engineer will determine the locations to sample grout and the number and type of samples collected for field and laboratory testing. Use API RP 13B-1 for field testing grout flow and

density of neat cement grout. 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.

Do not place grout if the grout temperature is less than 50°F (10°C) or more than 90°F (32°C) or if the air temperature measured at the location of the grouting operation in the shade away from artificial heat is below 40°F (4°C).

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. Place grout before the time between adding the mixing water and placing the grout exceeds that in the table below.

<b>ELAPSED TIME FOR PLACING GROUT (with continuous agitation)</b>		
<b>Air or Grout Temperature Whichever is Higher</b>	<b>Maximum Elapsed Time</b>	
	<b>No Set Retarding Admixture Used</b>	<b>Set Retarding Admixture Used</b>
90°F (32°C) or above	30 min.	1 hr. 15 min.
80°F (27°C) through 89°F (31°C)	45 min.	1 hr. 30 min.
79°F (26°C) or below	60 min.	1 hr. 45 min.

**MISCELLANEOUS**

Comply with Articles 1000-9 through 1000-12 of the *Standard Specifications* to the extent applicable for grout in lieu of concrete.

**CLEANING AND PAINTING EXISTING STRUCTURE**

**SPECIAL**

**SPECIALTY ITEMS:**

**Work Schedule** – Prior to beginning work, the Contractor shall submit his work schedule to the Engineer. Schedule shall be kept up to date, with a copy of the revised schedule being provided to the Engineer in a timely manner.

**SSPC QP-2 Certification** - The existing paint systems include toxic substances such as red lead oxide, which are considered hazardous if improperly removed. Only contractors who are currently SSPC QP-2, Category A certified, and have successfully<sup>1</sup> completed lead paint removal on similar structures within 18 months prior to this bid, may bid on and perform this work. **The**

<sup>1</sup> Successfully: Lead abatement work 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 NCDOT Std. Specification, Section 102-2.

**The apparent low bidder shall submit a list of projects for which QP2 work was performed within the last 18 months including owner contact information and submit to the Assistant State Bridge Management Engineer 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>**

**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.
- Painted surfaces have an adhesion that meets an ASTM D-3359, 3A rating.

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

**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 responds in writing about the acceptability of said plan. Such plan must meet or exceed the requirements of a Class 2A containment in accordance with SSPC Guide 6. Enclosure drawings and loads supported by the structure must be prepared, signed and sealed by a Registered North Carolina Professional Engineer.

In the containment plan describe how debris are contained and collected. Describe the type of tarpaulin and 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 vehicles 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) (See link below for NCDOT Guidelines for Managing Bridge Wash Water). 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 state and federal regulations.

**<http://www.ncdot.gov/projects/ncbridges/#stats>**

**Waste Handling of Paint and Abrasives** – The Contractor will 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 included in the APPENDIX which cites the specific regulations for each Generator category. Quantities of waste by weight and dates of waste generation must be recorded. Waste stored at the project site must be properly labeled.

The North Carolina Department of Environment and Natural Resources (NCDENR) has adopted RCRA as the North Carolina Hazardous Waste Management Rules and is 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://www.wastenotnc.org/HWHOME/WEBRules/NCHWRule.html>

The Contractor is required to maintain compliance with all federal, state and local regulations. Failure to comply with the regulations could result in fines and loss of qualified status with NCDOT.

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

Southern Logistics, Inc. – 312 Orvil Wright Blvd, 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)

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 must be disposed of as hazardous waste. Random sampling using composite samples of at least 20% (minimum of 2 composite samples) of the waste is required for characterization of the waste. A composite sample consists of equal mass samples from 3 to 4 drums. The Contractor shall furnish the Engineer certified test reports showing TCLP results of the paint chips stored on site, with disposal being in accordance with "Flowchart on Lead Waste Identification and Disposal".

([www.wastenotnc.org/hwhome/guidance/guidance.htm](http://www.wastenotnc.org/hwhome/guidance/guidance.htm)).

Until test results are received, all waste shall be stored and labeled as "NCDOT Bridge Paint Removal Waste-Pending Analysis" and include the date generated and contact information for the Division HazMat Manager or Project Engineer. Waste containers shall be stored in a covered and secured storage container. Once test results are received and characterized, waste shall be labeled as either "Hazardous Waste-Pending Disposal" or "Paint Waste-Pending Disposal".

Once the waste has been collected, and the quantity determined, the Contractor prepares the appropriate shipping documents and manifests and presents 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 permit application fees) 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:

[www.wastenotnc.org/HWHOME/ProvisionalIDRequirements.pdf](http://www.wastenotnc.org/HWHOME/ProvisionalIDRequirements.pdf)

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

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

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

#### **SUBLETTING OF CONTRACT:**

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

#### **SPECIFICATIONS:**

The North Carolina Department of Transportation (NCDOT) Standard Specifications for Roads and Structures dated July 2006, together with these Special Provisions apply to this project. Surface preparation and painting are performed in accordance with Section 442 except where otherwise noted in these Special Provisions. The Paint materials must meet the applicable



materials specifications under Section 1080. Materials approvals are in accordance with 4.0 Materials of this Special Provision.

### **1.0 PREPARATION OF SURFACES:**

- 1.1 Power washing with low pressure water – Before any other surface preparation are conducted, all surfaces shall be power washed to remove dust, salts, dirt and other contaminants. All wash water shall meet the requirements of NCDOT Managing Bridge Wash Water specification.
- 1.2 Blasting is done with recyclable steel grit meeting the requirements of Section 1080-15. The profile must be between 1.0 and 3.0 mils when measured on a smooth steel surface. A minimum of two tests per beam/girder and two tests per span of diaphragms/cross bracing shall be conducted and documented.
- 1.3 Before the contractor departs from the work site at the end of the work day, all debris generated during surface preparation are collected in approved containers.
- 1.4 The Contractor cleans a two square foot area at each structure to demonstrate the specified finish and the inspector preserves this area by covering it with tape, plastic or some other suitable means so that it can be retained as a site standard.
- 1.5 Any area of corroded steel (steel which has lost more than 50% of its original thickness) must not be painted until the Engineer observes its condition.
- 1.6 All parts of the bridges not to be painted, and the travelling public, shall be protected from overspray. The Contractor shall submit a plan to protect all parts of bridge that are not required to be painted, in addition to a plan to protect the traveling public and surrounding environment while applying all layers paint to a structure.
- 1.7 Surface chloride levels for painting are  $7 \text{ ug/cm}^2$  or below.
- 1.8 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.

### **2.0 PAINTING OF STEEL:**

Paint System 1, as specified in these special provisions and Section 442 of NCDOT's Standard Specifications, is to be used for this work. System 1 is an inorganic zinc primer and acrylic topcoats used over blast cleaned surfaces in accordance with SSPC-SP-10 (Near White Blast).

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

### **3.0 MATERIALS:**

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

#### **4.0 INSPECTION:**

Quality Assurance Inspection - The Contractor furnishes all necessary 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.

Contractor must insure that chloride levels on the surfaces are  $7 \text{ ug/cm}^2$  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. Test areas selected shall represent the greatest amount of corrosion in the span as determined by the Engineers' representative.

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.

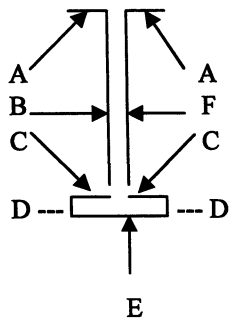
The Contractor informs the Engineer of all scheduled and unannounced inspections from SSPC, OSHA, EPA and/or others that come on site and furnishes the Engineer a copy of all inspection reports.

Inspection Instruments - The Contractor furnishes at least the following calibrated instruments at site and conducts the quality control testing:

- Sling Psychrometer - ASTM E-337 – bulb type
- Surface Temperature Thermometer
- Wind Speed Indicator
- Tape Profile Tester – ASTM D-4417 Method C
- Surface Condition Standards – SSPC VIS-1 and VIS-3
- Wet Film Thickness Gage – ASTM D-4414
- Dry Film Thickness Gage – SSPC-PA2 Modified
- Solvent Rub Test Kit – ASTM D-4752
- Adhesion Test Kit – ASTM D-3359 Method A (Tape Test)
- Adhesion Pull test – ASTM D-4541
- Surface Contamination Analysis Kit or (Chloride Level Test Kit)

The contractor maintains a daily quality control record in accordance with Section 442-12 and such records must be available at the job site for review by the inspector and be submitted to the Engineer as directed. In addition to the information required on M&T-610, the Contractor shall submit all DFT readings as required on M&T611.

- A. The dry film thickness is measured at each spot as indicated on the attached diagram at no less than three random locations along each girder in each 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 readings in accordance with SSPC PA-2.



	A	B	C	D	E	F
Loc. 1	_____	_____	_____	_____	_____	_____
Loc. 2	_____	_____	_____	_____	_____	_____
Loc. 3	_____	_____	_____	_____	_____	_____

Randomly select one A, one C and one D spot along with B, E and F.

- B. Two random adhesion tests (1 test=3 dollies) per span are conducted on interior surfaces in accordance with ASTM D-4541 after the prime coat has been properly cured in accordance with ASTM D-4752 with no less than a 4 resistance rating, and will be touched up by the Contractor. The required minimum average adhesion is 400 psi.
- C. Cure of the intermediate and stripe coats shall be accessed by utilizing the thumb test prior to the application of any successive layers of paint.
- D. One random Cut Tape adhesion test per span is conducted in accordance with ASTM D-3359 on interior surface after the finish coat is cured. Repair areas shall be properly tapered and touched up by the Contractor.

**5.0 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.

**6.0 ENVIRONMENTAL MONITORING:**

Comply with Section 442-13(B) of NCDOT’s Standard Specifications.

A “Competent Person<sup>2</sup>” is on site during all surface preparation activities and monitors the effectiveness of containment and dust collection systems. Any visible emissions outside the containment enclosure or pump monitoring results exceeding the level of 30 µg/m<sup>3</sup> TWA is justification to suspend the work. Before any work begins the Contractor provides a written summary of the responsible person’s safety training.

**7.0 HEALTH AND SAFETY RESPONSIBILITY:**

<sup>2</sup> **Competent Person** as defined in OSHA 29 CFR 1926.62 is 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 have authorization to take prompt corrective measures to eliminate them.

Comply with Section 442-13(C) of NCDOT's Standard Specifications. Insure 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 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.

**8.0 STORAGE OF PAINT AND EQUIPMENT:**

The Prime Contractor provides a location for materials, equipment and waste storage. Tarpaulins are spread over all pavements and surfaces underneath equipment utilized for abrasive recycling and other lead handling equipment or containers. All storage of paint, solvents and other

materials applied to structures shall be stored in accordance with Section 442 of the Specifications or manufacturers' requirements. The more restrictive requirements will apply.

**9.0 UTILITIES:**

The Contractor protects all utility lines or mains which may be supported on, under, or adjacent to bridge work sites from damage and paint over-spray.

**10.0 PAYMENT:**

The cost of inspection, surface preparation and repainting the existing structure is included in the lump sum price bid for *Cleaning and Repainting Bridge #\_\_\_*. 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, traffic and property; and furnishing blast cleaning equipment, paint spraying equipment, lighting equipment, brushes, rollers and any other hand or power tools and any other equipment; containment, handling and disposal of debris and wash water, all personal protective equipment, and all personal hygiene requirements.

*Pollution Control* will be paid for at the contract lump sum price which price will be full compensation for all collection, handling and disposal of debris and wash water, all personal protective equipment, and all personal hygiene requirements, and all equipment, material and labor necessary to fully contain the blast debris; daily collection of the blast debris into specified containers; and any measures necessary to ensure conformance to all safety and environments regulations as directed by the Engineer.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Cleaning and Repainting Bridge # ___	Lump Sum
Pollution Control	Lump Sum

## DESCRIPTION OF BRIDGES

**Bridge #104 Edgecombe County:** The bridge was built in 1967 and carries US 64 Byp East over the Tar River. The superstructure consists of 7 spans of 7 lines of W36 I-Beams @ 8'-4" spacing. The bridge is 490' in length with a concrete deck and a 48'-0" total deck width. The vertical clearance to normal water surface is 38'. The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is **29,430** sq. ft.

**Bridge #11 Franklin County:** The bridge was built in 1973 and carries NC 39 over US 64. The superstructure consists of 2 spans of 6 lines of W33 I-Beams and 2 spans of 6 lines of 54" plate girders @ 8'-0" spacing. The bridge is 276' in length with a concrete deck and a 46'-0" total deck width. The minimum roadway under clearance is 16'-8". The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is **22,360** sq. ft.

**Bridge #154 Nash County:** The bridge was built in 1960 and carries SR1603 over US 64. The superstructure consists of 4 spans of 4 lines of W33 I-Beams @ 8'-0" spacing. The bridge is 221' in length with a concrete deck and a 31'-6" total deck width. The minimum roadway under clearance is 15'-11". The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is **7,839** sq. ft.

**Bridge #169 Nash County:** The bridge was built in 1972 and carries SR1544 over US 64. The superstructure consists of 2 spans of 5 lines of W24 I-Beams and 2 spans of 5 lines of 54" plate girders @ 8'-3" spacing. The bridge is 297' in length with a concrete deck and a 38'-0" total deck width. The minimum roadway under clearance is 16'-2". The existing paint system is aluminum over red lead, and the estimated area to be cleaned and painted is **22,021** 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.

### MANAGING BRIDGE WASH WATER

SPECIAL

#### 1.0 Description

Collect and properly dispose of Bridge Wash Water from bridge decks.

#### 2.0 Construction Methods

(A) Prepare a written Bridge Wash Water management plan in accordance with the Guidelines for Managing Bridge Wash Water available at <http://www.ncdot.org/doh/preconstruct/ps/contracts/letting.html>. Submit plan and obtain approval from the Engineer prior to beginning of the bridge cleaning operation.

(B) Prior to final payment, submit a paper copy of all completed records pertaining to disposal of Bridge Wash Water.

#### 3.0 Measurement and Payment

Payment for collecting, sampling, testing, pH adjustment, monitoring, handling, discharging, hauling, disposing of the bridge wash water, documentation, record keeping, and obtaining permits if applicable, shall be included in the payment for other items.