

PROJECT SPECIAL PROVISIONS

STRUCTURE

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TERMS AND DEFINITIONS

(SPECIAL)

Unless noted otherwise, the following terms and their associated definitions are applicable throughout these Project Special Provisions:

Terms

Definitions

Railway, Railway Company,
Railroad, Railroad Company

Norfolk Southern Corporation

Railroad Engineer

The authorized representative of the Railway.

AREMA

American Railway Engineering and Maintenance-of-Way
Association.

NCDOT, Department,
Department of Transportation

North Carolina Department of Transportation.

Standard Specifications,
Specifications

NCDOT Standard Specifications for Roads and
Structures, January 2012.

Engineer, Department's Engineer
Project Engineer, Highway Engineer

The authorized representative of the NCDOT.

Inspector, Department's Inspector

The authorized inspector of the NCDOT.

126**MAINTENANCE AND PROTECTION OF TRAFFIC
BENEATH PROPOSED STRUCTURE AT STATION 3315+52.15 –MAIN–****(8-13-04)****1.0 GENERAL**

Maintain traffic on SR 1978 (Hopson Road) as shown in Traffic Control Plans and as directed by the Engineer.

Provide a minimum temporary vertical clearance of 15'-0" at all times during construction.

Submit plans and calculations for review and approval for protecting traffic and bracing girders, as described herein, at the above station before beginning work at this location. Have the drawings and design calculations prepared, signed, and sealed by a North Carolina Registered Professional Engineer. The approval of the Engineer will not relieve the Contractor of the responsibility for the safety of the method or equipment.

2.0 PROTECTION OF TRAFFIC

Protect traffic from any operation that affords the opportunity for construction materials, equipment, tools, etc. to be dropped into the path of traffic beneath the structure. Based on Contractor means and methods determine and clearly define all dead and live loads for this system, which, at a minimum, shall be installed between beams or girders over any travelway or shoulder area where traffic is maintained. Install the protective system before beginning any construction operations over traffic. In addition, for these same areas, keep the overhang falsework in place until after the rails have been poured.

3.0 BRACING GIRDERS

Brace girders to resist wind forces, weight of forms and other temporary loads, especially those eccentric to the vertical axis of the member during all stages of erection and construction. Before casting of intermediate diaphragms, decks, or connecting steel diaphragms do not allow the horizontal movement of girders to exceed ½ inch.

4.0 BASIS OF PAYMENT

Payment at the contract unit prices for the various pay items will be full compensation for the above work.

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

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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

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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.

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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

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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

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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.

C. 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.

D. 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.

SUBMITTAL OF WORKING DRAWINGS

(2-10-12)

1.0 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 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. Either the Structure Design Unit or the Geotechnical Engineering Unit or both units will jointly review submittals.

If a submittal contains variations from plan details or specifications or significantly affects project cost, field construction or operations, discuss the submittal with and submit all copies to the Resident Engineer. State the reason for the proposed variation in the submittal. To minimize review time, make sure all submittals are complete when initially submitted. Provide a contact name and information with each submittal. Direct any questions regarding submittal requirements to the Resident Engineer, Structure Design Unit contacts or the Geotechnical Engineering Unit contacts noted below.

In order to facilitate in-plant inspection by NCDOT and approval of working drawings, provide the name, address and telephone number of the facility where fabrication will actually be done if different than shown on the title block of the submitted working drawings. This includes, but is not limited to, precast concrete items, prestressed concrete items and fabricated steel or aluminum items.

2.0 ADDRESSES AND CONTACTS

For submittals to the Structure Design Unit, use the following addresses:

Via US mail:

Via other delivery service:

Mr. G. R. Perfetti, P. E.
State Bridge Design Engineer
North Carolina Department
of Transportation
Structure Design Unit
1581 Mail Service Center
Raleigh, NC 27699-1581

Mr. G. R. Perfetti, P. E.
State Bridge Design Engineer
North Carolina Department
of Transportation
Structure Design Unit
1000 Birch Ridge Drive
Raleigh, NC 27610

Attention: Mr. P. D. Lambert, P. E.

Attention: Mr. P. D. Lambert, P. E.

Submittals may also be made via email.

Send submittals to:

plambert@ncdot.gov (Paul Lambert)

Send an additional e-copy of the submittal to the following address:

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jgaither@ncdot.gov (James Gaither)

jlbolden@ncdot.gov (James Bolden)

For submittals to the Geotechnical Engineering Unit, use the following addresses:

For projects in Divisions 1-7, use the following Eastern Regional Office address:

Via US mail:

Mr. K. J. Kim, Ph. D., P. E.
Eastern Regional Geotechnical
Manager
North Carolina Department
of Transportation
Geotechnical Engineering Unit
Eastern Regional Office
1570 Mail Service Center
Raleigh, NC 27699-1570

Via other delivery service:

Mr. K. J. Kim, Ph. D., P. E.
Eastern Regional Geotechnical
Manager
North Carolina Department
of Transportation
Geotechnical Engineering Unit
Eastern Regional Office
3301 Jones Sausage Road, Suite 100
Garner, NC 27529

For projects in Divisions 8-14, use the following Western Regional Office address:

Via US mail:

Mr. John Pilipchuk, L. G., P. E.
Western Regional Geotechnical
Manager
North Carolina Department
of Transportation
Geotechnical Engineering Unit
Western Regional Office
5253 Z Max Boulevard
Harrisburg, NC 28075

Via other delivery service:

Mr. John Pilipchuk, L. G., P. E.
Western Region Geotechnical
Manager
North Carolina Department
of Transportation
Geotechnical Engineering Unit
Western Regional Office
5253 Z Max Boulevard
Harrisburg, NC 28075

The status of the review of structure-related submittals sent to the Structure Design Unit can be viewed from the Unit’s web site, via the “Contractor Submittal” link.

Direct any questions concerning submittal review status, review comments or drawing markups to the following contacts:

Primary Structures Contact:

Paul Lambert (919) 707 – 6407
(919) 250 – 4082 facsimile
plambert@ncdot.gov

Secondary Structures Contacts:

James Gaither (919) 707 – 6409
James Bolden (919) 707 – 6408

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Eastern Regional Geotechnical Contact (Divisions 1-7):

K. J. Kim (919) 662 – 4710
 (919) 662 – 3095 facsimile
kkim@ncdot.gov

Western Regional Geotechnical Contact (Divisions 8-14):

John Pilipchuk (704) 455 – 8902
 (704) 455 – 8912 facsimile
jpilipchuk@ncdot.gov

3.0 SUBMITTAL COPIES

Furnish one complete copy of each submittal, including all attachments, to the Resident Engineer. At the same time, submit the number of hard copies shown below of the same complete submittal directly to the Structure Design Unit and/or the Geotechnical Engineering Unit.

The first table below covers “Structure Submittals”. The Resident Engineer will receive review comments and drawing markups for these submittals from the Structure Design Unit. The second table in this section covers “Geotechnical Submittals”. The Resident Engineer will receive review comments and drawing markups for these submittals from the Geotechnical Engineering Unit.

Unless otherwise required, submit one set of supporting calculations to either the Structure Design Unit or the Geotechnical Engineering Unit unless both units require submittal copies in which case submit a set of supporting calculations to each unit. Provide additional copies of any submittal as directed.

Working Drawing Submittal	Copies Required by Structure Design Unit	Copies Required by Geotechnical Unit	Contract Reference Requiring Submittal
Arch Culvert Falsework	5	0	Plan Note & SN Sheet
Box Culvert Falsework ²	5	0	Plan Note & SN Sheet
Cofferdams ⁴	6	1	Articles 410-5 & 420-8
Expansion Joint Seals (hold down plate type with base angle)	9	0	Expansion Joint Seals
Expansion Joint Seals (modular)	2, then 9	0	Modular Expansion Joint Seals
Expansion Joint Seal (strip)	9	0	Strip Seals

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seals)			
Falsework & Forms (superstructure)	8	0	Article 420-3
Falsework & Forms ² (substructure)	8	0	Article 420-3
Mechanically Stabilized Earth Retaining Walls ⁴	7	1	MSE Retaining Walls
Metal Bridge Railing	8	0	Plan Note
Metal Stay-in-Place Forms	8	0	Article 420-3
Metalwork for Elastomeric Bearings	7	0	Article 1072-10
Miscellaneous Metalwork ^{5,6}	7	0	Article 1072-10
Overhead Sign Assemblies	13	0	Article 903-3©
Pile Points	7	1	Article 450-8(D) & Steel Pile Points
Placement of Equipment on Structures (cranes, etc.)	7	0	Article 420-20
Precast Concrete Box Culverts	2, then 1 reproducible	0	(Optional) Precast Reinforced Concrete Box Culvert at Station ____
Precast Retaining Wall Panels	10	0	Article 1077-2
Pot Bearings ⁵	8	0	Pot Bearings
Prestressed Concrete Deck Panels	6 and 1 reproducible	0	Article 420-3
Proprietary Retaining Walls ⁴	9	0	Applicable Project Special Provisions
Prestressed Concrete Girder (strand elongation and detensioning sequences)	6	0	Articles 1078-8 and 1078-11
Prestressed Concrete Cored Slab (detensioning sequences) ³	6	0	Article 1078-11

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Revised Bridge Deck Plans (adaptation to metal stay-in-place forms)	2, then 1 reproducilble	0	Article 420-3
Revised Bridge Deck Plans(adaptation to modular expansion joint seals)	2, then 1 reproducilble	0	Modular Expansion Joint Seals
Soil Nail Retaining Retaining Walls ⁴	4	1	Applicable Project Special Provisions
Sound Barrier Wall Steel Fabrication Plans ⁶	7	0	Article 1072-10 & Sound Barrier Wall
Sound Barrier Wall Casting Plans	10	0	Article 1077-2 & Sound Barrier Wall
Structural Steel ⁵	2, then 7	0	Article 1072-10
TFE Expansion Bearings ⁵	8	0	Article 1072-10
Temporary Detour Structures ⁴	10	1	Article 400-3 & Construction and Removal of Temporary Structure at Station ____
Temporary Shoring ⁴	6	1	Article 410-4 & Temporary Shoring for Maintenance of Traffic
Temporary Fabric for Wire Walls ⁸	0	2	Applicable Project Special Provisions
Permanent Anchored Tieback Retaining Walls ⁴	4	1	Applicable Project Special Provisions
Evazote Joint Seals ⁷	9	0	Applicable Project Special Provisions
Optional Disc Bearings ⁵	8	0	Optional Disc Bearings
Removal of Existing Struture over Railroad	5	0	Railroad Special Provisions
Drilled Pier Construction Sequence ⁸	0	1	Article 411-3
Pile Hammers ⁸	0	1	Article 450-6
Cross Hole Sonic Logging	0	1	Article 411-5

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(CSL) Reports ⁸			
Pile Driving Analyzer (PDA) Reports ⁸	0	1	Article 450-1

FOOTNOTES

1. References are provided to help locate the part of the contract where the working drawing submittals are required. References in quotes refer to the Project Special Provision by that name. Articles refer to the Standard Specifications.
2. Submittals for these items are necessary only when plan notes require them.
3. Submittals for these items may not be required. A list of pre-approved sequences is available from the producer or the Materials and Tests Unit.
4. These submittals are reviewed by the Structure Design Unit and the Geotechnical Engineering Unit. If NCDOT Shoring Standards are used, working drawings need not be submitted, but the Shoring Selection Form should be forwarded to the Geotechnical Engineering Unit.
5. The fabricator may submit these items directly to the Structure Design Unit.
6. The two sets of preliminary submittals required by Article 1072-10 of the Standard Specifications are not required for these items.
7. Submittals for Fabrication Drawings are not required. Submission of Catalogue Cuts of Proposed Material is required. See Section 5.A of the Project Special Provision.
8. Submittals for these items are reviewed by the Geotechnical Engineering Unit only and correspondence regarding these items should be directed to and will come from the Geotechnical Engineering Unit.

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.

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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.

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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.

WATERPROOFING**(SPECIAL)**

Waterproof the top surface of the bridge deck and all construction joints which will be covered by fill with a cold

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liquid-applied elastomeric membrane to the limits shown in the contract plans. Waterproofing membrane shall be a two coat, rapid cure, seamless, cold liquid spray applied membrane such as the "Eliminator" system manufactured by Stirling Lloyd Products, Inc., or the "Bridge Deck Membrane" system manufactured by Bridge Preservation L.L.C (R.J. Watson, Inc.) or approved equal. Apply waterproofing in strict accordance with manufacturer's recommendations. Immediately prior to application of membrane, clean the surfaces to be waterproofed per the manufacturer's recommendations. Membrane protection is not required, i.e., ballast may be placed directly on top of the fully cured membrane waterproofing.

The entire cost of the waterproofing complete in place shall be included in the unit contract price bid for "Waterproofing".

PORTLAND CEMENT**(SPECIAL)**

Portland Cement shall meet the requirements of the Standard Specifications for the type specified for the work. In addition, in order to minimize alkali content, the total percentage of sodium oxide (Na₂O) present plus 0.658 times the total percentage of potassium oxide (K₂O) present shall not exceed 0.60 percent. The Contractor shall furnish the Engineer with two (2) copies of certified mill test reports from the manufacturer stating that all cement meets the above requirements.

Flyash may be substituted for cement in the amounts shown in Section 1024-1 of the Standard Specifications provided that the minimum cement requirement as shown on the Plans has been satisfied. In no case shall the substitution of flyash or other admixtures approved by the Engineer be in lieu of the minimum cement requirements.

FINE AND COARSE AGGREGATE**(SPECIAL)**

The fine and coarse aggregates used in all concrete on the railway structure shall be non-reactive in accordance with the "Method of Test for Potential Reactivity of Aggregates (Chemical Method)", ASTM Designation C289-81. The Contractor shall furnish the Engineer two (2) copies of the above test reports certifying that the fine and coarse aggregates are non-reactive and will not cause an alkali reaction.

WATERSTOPS**(SPECIAL)**

Waterstops shall be made of an approved flexible polyvinyl-chloride plastic conforming to U.S. Corps of Engineers Specification CRD-C-572-74 or rubber conforming to U.S. Corps of Engineers Specification CRD-C-513-75. Waterstops shall be made in the shape and of the material specified on the Plans. The material shall form a continuous waterstop across the slab and up the parapets of bridge decks, abutment wings, or other locations as shown on the Plans. Waterstops shall be fabricated in continuous units without splices, using material of the longest length available. Where bonded joints are necessary, like materials shall be bonded together by experienced men in accordance with the manufacturer's instructions. The entire cost of the waterstop complete in place shall be included in the unit contract price bid for "Reinforced Concrete Deck Slab."

141**ELASTOMERIC FLASHING****(SPECIAL)**

The elastomeric flashing at the expansion joint between deck slabs shall be a continuous sheet of synthetic rubber 1/16" thick by 10" wide or equal based on polychloroprene having properties specified by the following test data:

Tensile Strength, ASTM D-412-80	2,000 psi minimum
Elongation, ASTM D-412-80	300% minimum
Hardness, ASTM D-2240-81	60 ± 10
Water Absorption, ASTM D-471-79	10% maximum

The adhesive for use with the flashing shall be as recommended by the manufacturer of the synthetic rubber furnished and shall be applied according to the manufacturer's instructions.

The entire cost of the elastomeric flashing, complete in place, shall be included in the unit contract price bid for "Reinforced Concrete Deck Slab."

RUBBER JOINT COMPOUNDS**(SPECIAL)**

Expansion joints shall be sealed with a two component elastomeric polymer type cold-applied synthetic joint sealer, manufactured with Thiokol polysulfide liquid polymers. The material shall be grey polysulfide rubber base caulking compound conforming to Specification ANSI A-116.1. Pouring type compound shall be used for horizontal joints and non-sag type for other joints. The mixing and application of the joint sealing compound shall be performed with the equipment recommended and in strict accordance with the manufacturer's instructions. The entire cost of rubber joint compounds shall be included in the unit contract price bid for "Reinforced Concrete Deck Slab."

STRUCTURE DRAINAGE SYSTEM**(SPECIAL)****Materials**

Ductile iron pipe (D.I.P) collector system shall be as detailed and specified on the Plans. Perforated pipe drains behind the abutments shall be corrugated steel pipe as detailed on the Plans. French drain material behind abutments shall be No. 467M crushed stone or gravel conforming to Table 1005-1, Aggregate Gradation.

Installation

Deck drains shall be located as shown on the Plans. The D.I.P. collector system shall be installed as detailed and specified on the Plans.

Perforated pipe drains behind the abutments shall be laid with perforations turned down and bedded on a layer of compacted impervious clay. The perforations shall be kept open and free from the clay bedding course, asphalt coating, or other material. The French drain material shall be placed concurrently with the backfill and shall be kept separate with a thin timber slide or burlap bag. Perforated pipe behind abutments and outfall pipes shall be laid on a grade of at least one percent (1%) and shall be located as shown on the Plans.

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Grades of pipe drains shall be set by the Engineer. Copies of shop drawings showing details of the drainage system shall be submitted by the Contractor to the Engineer for approval. The drainage system must be approved prior to fabrication.

Basis of Payment

Payment for the "Structure Drainage System" will be made at the contract lump sum price bid, which price and payment shall be full compensation for furnishing all materials and labor to install the drainage system complete, including ductile iron pipe, deck drains, fittings, excavation, perforated pipe drains, French drain material, other backfill and outfall pipes.

BACKFILLING AROUND STRUCTURES**(SPECIAL)**

Backfill material behind abutments (except No. 467M crushed stone or gravel for French drains over perforated drain pipes) shall be Type A Aggregate Base Course (ABC) in accordance with the Standard Specifications. Placing and compacting shall be as provided for in Section 410-8 of the Standard Specifications.

Backfill around structures, except as specified above, shall be suitable material available from the excavations. In the event material excavated is not approved for use as backfill by the Engineer, the Contractor will be required to furnish and haul to the structure site the necessary suitable backfill material. Placing and compacting shall be as provided in Section 410-8 of the Standard Specifications.

Disposal of surplus excavated material shall be as specified in Section 410-1 of the Standard Specifications.

Payment for furnishing ABC backfill material and any suitable material to replace excavated material and for placing and compacting all backfill material shall be included in the contract unit price for the several other pay items.

SELF-LUBRICATING EXPANSION BEARING ASSEMBLIES**(SPECIAL)****Description**

The self-lubricating expansion bearing assemblies each consist of an oilless self-lubricating copper alloy plate, a sole plate, a sliding plate with keeper bars, a masonry plate, any necessary fill plates, a bearing pad, an anchor bolt assembly which includes anchor bolts, nuts, and washers, pipe sleeves, a closure plate, grout, various sizes of standard pipe, and any other necessary material as detailed on the Plans. These bearing assemblies are located at the expansion ends of applicable spans as shown on the Plans.

Requirements

Use self-lubricating copper alloy bearing plates that are an approved article of standard production by an established manufacturer of such equipment installed in accordance with the manufacturer's recommendations and conforming to the following requirements:

- Copper alloy conforming to AASHTO M107 Alloy 911 or AASHTO M108 Alloy 510.

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- Lubricant of the solid type and consisting of graphite, metallic substances having lubricating properties and a lubricating binder. Do not use materials without lubricating qualities or that promote chemical or electrolytic reactions. Use lubricant that is integrally molded and compressed into the lubrication recesses to form a dense, non-plastic lubricant.
- Recesses arranged in a geometric pattern so that successive rows overlap in the direction of motion and the distance between extremities of recesses is closer in the direction of motion than that perpendicular to motion. Lubricate the entire bearing area of all surfaces that have provision for motion by means of these lubricant filled recesses. Provide a total area of these recesses between 25% and 35% of the total bearing area of the plate.
- Furnish bearing plates in sizes specified on the drawings. Machine finish the bearing surfaces and make sure that the surface roughness does not exceed 125 micro inches (3.18 microns) when measured in accordance with ASA Standard B46.1-1955. Also finish the bearing surfaces of the opposing steel plates as above. Align the tool marks in the direction of motion. Finish the bearing surfaces so that all machine surfaces are flat within 0.0005 inch per inch of length and width.
- For mating curved surfaces of steel and copper alloy, the maximum positive tolerance for the concave surface is 0.010 inch and the maximum negative tolerance for the convex surface is 0.010 inch.
- The coefficient of friction between the copper alloy self-lubricating plates and the steel plates in contact with them does not exceed 0.10 when subjected to the designed unit loading and at twice the designed unit loading.

Basis of Payment

Payment for the bearing assemblies will be at the contract lump sum price bid for "Self-lubricating Expansion Bearing Assemblies." Such lump sum price will be full compensation for all materials, tools, equipment, labor and incidentals necessary to furnish and install the self-lubricating bearing assemblies.

Payment for the Fixed Bearing Assemblies as shown on the Plans will be included in the lump sum price bid for "Structural Steel."

CONDUIT IN PARAPETS**(SPECIAL)**

Conduit in the parapets shall be 4" diameter PVC conduit conforming to applicable Underwriters Laboratory specifications and shall be located as shown on the Plans. Provisions shall be made for expansion between the deck slab and abutment backwalls and between deck slabs at expansion joints. Couplings shall be provided behind backwalls for connection to the 4" diameter rigid pipe. If non-PVC fittings, couplings, or other incidental items are required, they must be fully compatible with PVC conduit. Details and material data shall be submitted by the Contractor to the Engineer for approval by the Railway Company of all materials required for this work. The entire cost of furnishing and installing all conduit, expansion fittings, couplings and incidental items required for this work shall be included in the unit contract price bid for "Concrete Parapet".

CONCRETE PARAPET**(SPECIAL)**

Concrete Parapet shall be as shown on the plans and shall comply with Section 460 of the Standard Specifications.

Form grooved contraction joints by a tool specifically constructed for this purpose or by sawing with an approved concrete saw. Groove contraction joints to the depth shown in the plans and to a width between 1/4" and 1/2",

unless otherwise shown in the plans. If formed by a tool, make a radius of 1/8" at the corners of the adjacent concrete.

The quantity of concrete parapet to be paid for will be measured and paid as the number of linear feet of concrete parapet provided in the plans. Full compensation for the work shall include, but is not limited to, falsework and formwork, concrete, reinforcing steel, admixtures, all other materials and placing, finishing and curing the concrete. The quantity of concrete parapet as measured above will be paid for at the contract unit price per linear foot for "Concrete Parapet".

METAL RAIL (ALUMINUM)

(SPECIAL)

The Metal Handrail shall be as shown on the Plans. The quantity of handrail to be paid for will be the actual number of linear feet of handrail measured continuously along the top bar of the rail from end to end which has been completed and accepted. Full compensation for the work shall include, but is not limited to, furnishing posts, rails, fittings and all other materials and fabricating and erecting the metal rail. The quantity of metal rail as measured above will be paid for at the contract unit price per linear foot for "Metal Rail (Aluminum)".

STRUCTURAL STEEL

(SPECIAL)

I. STRUCTURAL STEEL

A. Scope

This Special Provision shall cover the furnishing, fabrication, preparation, assembly, welding, painting, and erection of all structural steel shown on the Plans.

B. General Specifications

1. Except as otherwise specified hereinafter, the current AREMA Specifications, Chapter 15, Steel Structures, apply to all work under this section.

C. Structural Steel

1. Fracture Critical Members

- a. All fracture critical members are identified on the Plans.
- b. All fracture critical members will be fabricated in accordance with the Fracture Control Plan stated in the AREMA Specifications, Chapter 15, Section 1.14.
- c. Fabricator shall be certified under the AISC Quality Certification Program as follows:

Welded Plate Girders Category III

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Rolled Beam Bridges Category I.

- d. Structural steel shall meet the current requirements of the ASTM Specifications for Structural Steel, Designation A-709, Grade 50, S84-F2, S91, S93.

S84-F2 (Fracture Critical – Charpy Test Zone 2)
 S91 (Fine Austenitic Grain Size)
 S93 (Limitation on Weld Repairs)

Except as noted in the AREMA Fracture Control Plan.

2. Non-Fracture Critical Members

- a. All primary members or components requiring improved notch toughness are identified on the Plans.
- b. Fabricator shall be certified under the AISC Quality Certification Program as follows:

Welded Plate Girders	Category III
Rolled Beam Bridges	Category I

- c. Structural steel shapes and plates used as primary members or components shall meet the current requirements of the ASTM Specifications for Structural Steel, Designation A-709, Grade 50, S83-T2, S91.

S83-T2 (Non-Fracture Critical – Charpy Test Zone 2)
 S91 (Fine Austenitic Grain Size)

3. Other Structural Steel

- a. It is preferred that the Fabricator be certified under the AISC Quality Certification Program, Category I.
- b. All structural steel shall meet the current requirements of the Specification for ASTM Designation A-709, Grade 50, unless specified otherwise in this Special Provision or on the Plans.

D. Other Materials

- High strength bolts shall meet the current requirements of the ASTM Specifications for High Strength Bolts for Structural Steel Joints, Designation A 325.
- Anchor bolts shall be threaded rods with heavy hex nut meeting the current requirements of ASTM specification for fasteners, Designation A-449.
- Welding electrodes for arc welding shall meet the current requirements of the Specifications for mild steel arc-welding electrodes Series E70, AWS 5.1, Low Hydrogen Classification for SMAW and AWS 5.17 for SAW.

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4. Preformed fabric bearing pads shall be Shock Pad Style No. 15175 as manufactured by Alert Manufacturing and Supply Company, Chicago, Illinois, or FABREEKA Pads as manufactured by Fabreeka Products Company, 1190 Adams Street, Boston, Massachusetts, or SORBTREX Pads as manufactured by Voss Engineering, Inc., Chicago, Illinois, or approved equal.

E. Welding Processes

Only submerged arc welding (SAW) or shielded metal arc welding (SMAW) may be used. No other process will be allowed.

F. Bolted Connections

Permanent bolted connections using High Strength Bolts shall be installed and tightened using the Turn-of-the-Nut Method.

G. Paint

All steel preparation and painting shall be in accordance with the Special Provision PAINTING STRUCTURAL STEEL.

H. Shop Drawings

1. The Contractor's attention is called to the requirements for shop drawings, Chapter 15, Article 1.1.3 Shop Drawings, AREMA Specifications.
2. The Contractor's shall furnish three (3) complete sets of detailed shop drawings to the Company for approval prior to starting fabrication. Unchecked drawings shall not be submitted for approval. After approval of shop drawings, the Contractor shall supply the Company with one set of reproducible of the approved drawings.
3. The rejection of or the procedure for the correction of shop drawings will not be considered as cause for delay.
4. Approval by the Engineer of the shop drawings shall not relieve the Contractor from furnishing material of proper dimensions, quantity, and quality, nor will such approval relieve the Contractor from the responsibility for errors of any sort in the shop drawings.
5. Original drawings or photographic reproducible on mylar, or equivalent film, shall be furnished at the completion of the Contract in accordance with Chapter 15, Article 1.1.3, AREMA Specifications. Reproducible made by the diazo process are not acceptable. The plans shall be sent to:

Chief Engineer – Bridges & Structures
 Norfolk Southern Corporation
 99 Spring Street, SW, Box 142
 Atlanta, GA 30303

II. SHOP INSPECTION & TESTING

1. The Company may arrange for inspection by an independent inspection firm under a separate contract. This inspection will be in addition to the Fabricator's Quality Control Program.

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2. The Fabricator shall notify the Company and its inspector of the scheduled date for beginning fabrication and shall not begin fabrication until the Company's Inspector is present.
3. The Fabricator shall furnish copies of certified mill inspection reports to the Company for all structural steel requiring improved notch toughness.
4. The Fabricator shall meet the requirements of the AREMA Fracture Control Plan described in Chapter 15, Section 1.14 for all members and components designated as fracture critical.
5. Welding Inspection shall verify that all welds and welding procedures meet the requirements of the American Welding Society (A.W.S.) Bridge Welding Code, D1.5, current edition.
6. All welds shall be inspected visually and by use of nondestructive testing. All nondestructive testing shall be performed by the Fabricator and witnessed by the Company's Inspector.
7. Witnessing of weld inspection shall be done in a timely manner without disruption of normal shop operations. Copies of all weld inspections and nondestructive testing reports shall be furnished to the Company.
8. The Fabricator shall perform the following weld inspection and testing:
 - (a) All transverse tension groove welds in FCM members, when allowed by the Engineer, shall be RT and UT tested 100%. In non-FCM components of FCM's all transverse groove welds shall be RT or UT tested 100%.
 - (b) All flange to web welds shall be tested on both sides as follows:
 1. Top flange to web welds will be UT tested 100% over 10% of the length from each end and the remaining length of weld will be UT tested 10%.
 2. Bottom flange to web welds will be UT 100%.
 - (c) All flange to web fillet welds, when allowed by the Engineer, are to be magnetic particle tested 100%.

Ten percent (10%) of all welds not mentioned above shall be magnetic particle tested.

III. MEASUREMENT AND PAYMENT

Payment will be made at the contract lump sum price for the bid item "Approx. 585,411 Lbs. Structural Steel" and shall constitute full payment for all costs of plant, superintendent, labor, material, and equipment necessary to furnish, fabricate, shop paint, and shop assemble and deliver all the structural steel required for the project in accordance with the Plans, Specifications, and Special Provisions, including furnishing the fabric bearing pads, the fixed bearing assemblies and anchor bolts.

148**PAINTING STRUCTURAL STEEL****(SPECIAL)****Plans and Specifications**

This work consists of furnishing all labor, material, plant and equipment, and performing all operations in connection with Shop Painting (prime coat, wash coat, and top coat applied in the fabricators plant or unless otherwise specified by the Railway). All painting shall be in accordance with AREMA Specifications, Chapter 15, Section 3.4, and recommendations of the Steel Painting Council Specifications with the following specific requirements.

The paint thickness will be measured according to “SSPC-PA2” Method for Measurement of Dry Paint Thickness with Magnetic Gages.

In addition to the requirements specified herein, all structural steel shall receive a stripe coat of paint per the Standard Specifications.

Surface Preparation

The surface preparation shall be in accordance with Steel Structures Painting Council Specifications SP 10 (NEAR WHITE BLAST) latest revision and Visual Standard NACE No. 2. Average surface profile to be 2 mils.

Application: The paint shall be applied in accordance with SSPC Specifications for Paint Application – PA1.

The Prime Coat shall be applied in the shop promptly after blast cleaning, but in no case shall the Prime Coat be applied more than 8 hours after blast cleaning or after visible or detrimental rusting occurs.

Steel shall be cleaned by washing or other mechanical means to remove all residue (loose zinc dust and foreign matter) prior to applying Wash and Top Coat.

Surfaces damaged during shipment and handling shall be repaired using the same paint system as applied in the shop except that the Prime Coat shall be repaired using an ***Organic Zinc Primer*** when the Prime Coat is repaired in the field.

Welded Areas and Faying (Contact) Surfaces

No paint shall be applied to areas to be welded in the field. No acrylic paint (wash or top coat) shall be applied to any faying surfaces.

Paint Systems

The fabricator will be given the option of using one of the following paint systems (***Prime Coat, Intermediate and Top Coats shall be applied in the fabricator’s plant unless otherwise specified by the Railway.*** If the Intermediate Coat and Top Coat are applied in the field, the steel shall be solvent wiped to remove all grease

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and oil and a ***“High Pressure Power Washing” with clean water (3500 psi minimum)*** shall be used to clean all mud and dirt off prior to applying the touch-up Primer or Intermediate and Top Coats. The Chief Engineer Bridges and Structures is to be notified of the fabricator’s choice. Priming of the contact surfaces with ***Inorganic Zinc-Rich Primer*** is required.

If approved or further specified by the Railway, the Wash Coat and Top Coat shall be applied in the shop. Intermediate Coat color shall be White and Stripe Coat color shall be Light Gray. Top Coat color shall be Light Gray, Paint Code: 26306 (Federal Standard 595B).

SYSTEM #1 (DAVIS-FROST)

Prime Coat: P-139 LOW V.O.C. Inorganic Zinc Primer applied at 4.0 – 5.0 mils Dry Film Thickness.

Intermediate Coat: W-112 Water Guard Metal Primer applied at 3.0 – 4.0 mils Dry Film Thickness.

Finish (Top) Coat: W-195 Water-Tuff DTM Finish applied at 3.0 – 4.0 mils Dry Film Thickness.

Touch Up Primer: P-281 (3 component) Epoxy Zinc-Rich Primer applied at 4.0 – 5.0 mils Dry Film Thickness.

Suggested Supplier: Davis-Frost, Inc.
P.O. Box 11405
Lynchburg, VA 24506
Telephone: (804) 846-5277

SYSTEM #2 (ELITE)

Prime coat: Elite 1312 Inorganic Zinc Rich Primer applied at 4.0 – 5.0 mils Dry Film Thickness.

Intermediate Coat: Elite 156 Exterior Acrylic Latex applied at 3.0 – 4.0 mils Dry Film Thickness.

Finish (Top) Coat: Elite 156 Exterior Acrylic Latex applied at 3.0 – 4.0 mils Dry Film Thickness.

Touch Up Primer: Elite 305 Organic Zinc-Rich Primer applied at 4.0 – 5.0 mils Dry Film Thickness.

Suggested Supplier: Elite Coatings Company, Inc.
P.O. Box 130
Gordon, GA 31031
Telephone: (912) 628-2111

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SYSTEM #3 (DEVOE)

Prime Coat: Cata-Coat 301 Inorganic Zinc-Rich Primer applied at 4.0 – 5.0 mils Dry Film Thickness.

Intermediate Coat: DEVRAN 646 Water Based Epoxy primer applied at 3.0 – 4.0 mils Dry Film Thickness.

Finish (Top) Coat: DEVFLEX 604-S-9903 Water Based Gloss Enamel applied at 3.0 – 4.0 mils Dry Film Thickness.

Touch Up Primer: Cata-Coat 303H Organic Zinc-Rich Epoxy applied at 4.0 – 5.0 mils Dry Film Thickness.

Suggested Supplier: Devoe Coatings Company
 1519 West Liberty Avenue
 Pittsburgh, PA 15226
 Telephone: (412) 561-8930
 Attn: Joe Basile

SYSTEM #4 (SHERWIN-WILLIAMS)

Prime Coat: ZINC CLAD II HS-(B69VZ1 B69VZ3 B69D11) Inorganic Zinc-Rich Primer applied at 4.0 – 5.0 mils Dry Film Thickness

Intermediate Coat: B66 Series DTM ACRYLIC GLOSS applied at 3.0 – 4.0 mils Dry Film Thickness.

Finish (Top) Coat: B66 Series DTM ACRYLIC GLOSS applied at 3.0 – 4.0 mils Dry Film Thickness.

Touch Up Primer: ZINC CLAD IV-(B69 A8/B69 V8) applied at 4.0 – 5.0 mils Dry Film Thickness.

Suggested Supplier: The Sherwin-Williams Company
 765 North Avenue, NE
 Atlanta, GA 30306
 Telephone: (404) 873-6723

SYSTEM #5 (VALSPAR)

Prime Coat: Valspar MZ-7 Inorganic Zinc-Rich Primer applied at 4.0 – 5.0 mils Dry Film Thickness.

Intermediate Coat: #61 Series Water-Acrylic Lo Sheen applied at 3.0 – 4.0 mils Dry Film Thickness.

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Finish (Top) Coat: #61 Series Water-Acrylic Lo Sheen applied at 3.0 – 4.0 mils Dry Film Thickness.

Touch Up Primer: MZ-4 Epoxy Zinc-Rich Primer applied at 4.0 – 5.0 mils Dry Film Thickness.

Suggested Supplier: Corrosion Specialties, Inc.
3897 Stephens Court
P.O. Box 146
Tucker, GA 30085-0146
Telephone: (404) 938-7263
Attn: Andy Steinmann

SYSTEM #6 (AMERON)

Prime Coat: Amercoat 21-5 Inorganic Zinc-Rich Primer applied at 4.0 – 5.0 mils Dry Film Thickness.

Intermediate Coat: Amercoat 148 Waterborne Acrylic primer applied at 3.0 – 4.0 mils Dry Film Thickness.

Finish (Top) Coat: Amercoat 220 Waterborne Acrylic applied at 3.0 – 4.0 mils Dry Film Thickness.

Touch Up Primer: Amercoat 68HS Zinc-Rich Primer applied at 4.0 – 5.0 mils Dry Film Thickness.

Suggested Supplier: Ameron Protective Coatings Division
11605 Vimy Ridge Road
Little Rock, AK 72209
Telephone: 1-800-283-6627

Post-Painting Requirements

- a) Steel shall be cleaned by washing or other mechanical means to remove all residue (loose zinc dust and foreign matter) prior to applying Wash and Top Coat. An **"M.E.K. Rub Test"** shall be used to assure proper cure of the inorganic zinc primer prior to applying the next coat.
- b) **The Intermediate Coat may have to be thinned to prevent gassing.**

Painting Materials Requirements

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a) Packaging and Shipping.

All paint shall be received at the point of use in original containers and carefully stored. All paint to be used shall be freshly mixed and shall be ordered only a sufficient length of time in advance of its use to insure an adequate supply being on hand at all times so as not to delay the work.

Paint shipped to the job shall arrive in sealed containers clearly marked with the type of paint and specifications controlling its manufacture.

There shall be no modification of the paint except upon, and in accordance with, express written stipulation by an authorized representative of the paint manufacturer and with specific approval of the Engineer.

b) Storage.

Paint in storage at the shop or in the field shall have the position of the containers reversed at least once a week to prevent settlement and separation of the pigment from the vehicle. There shall be suitable devices maintained at the point of storage and used for agitation and thorough mixing of the paint prior to its use on this work.

c) Sample Panel.

If directed by the Engineer, a sample panel shall be made up. The panel shall be used as a basis of comparison of the work on this contract. The panel shall be of size designated by the Engineer and shall be prepared and painted in all respects in the same manner as the work will be done.

Workmanship

a) Weather Conditions.

Paint shall not be applied when the temperature of the air is less than 40 degrees F, the surface of the metal is not dry, the relative humidity is above 85%, or when, in the opinion of the Engineer, conditions are otherwise unsatisfactory for such work. Paint shall not be applied upon damp or frosted surfaces. Material painted under cover in damp or cold weather shall remain under cover until dry or until weather conditions permit its exposure in the open. Painting shall not be done when the metal is hot enough to cause the paint to blister and produce a porous paint film.

b) Application.

Paint shall be applied in accordance with SSPC Specifications for Paint Application-PA1 and in accordance with manufacturer's recommendations.

All blast cleaned steel surfaces shall be primed before completion of the work day.

Steel shall be cleaned by washing, brushing or other mechanical means of all residue (loose foreign matter) prior to applying the finish coat (Top Coat)

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c) Removal of Unsatisfactory Paint.

If the Prime Coat “mud-cracks”, the Top Coat wrinkles or shows evidence of having been applied under unfavorable conditions, or if the workmanship is poor, the Engineer may order it removed and the metal thoroughly cleaned and repainted. Any “Blushing” of the Acrylic Top Coat shall be corrected by solvent wiping and/or recoating before final acceptance by the Railway Company.

d) Thinning.

No thinner shall be used if the paint can be applied in a neat workmanlike manner without thinning. If the paint is too thick to spray, only the manufacturer’s specified thinner (in hot weather, acrylic paint shall be thinned with M.I.B.K. to reduce the chances of “Blushing” occurring) may be added to the paint up to 25% by volume or as otherwise specified by the manufacturer. Thinning shall not relieve the contractor from applying the specified coating Dry Film Thickness.

e) Paint Touch-Up.

After erection, all damaged areas shall be cleaned of mud and dirt by **High Pressure Power Washing with clean water (3500 psi minimum)**; grease and oil by **solvent wiping**; and rusted areas shall be cleaned by **sand blasting or power tool cleaning** with non-woven abrasives prior to touch-up or Top coating. The paint used for touch-up shall be the same system used in the shop. The contractor and/or fabricator shall be responsible for cleaning all damaged surfaces and applying all field touch-up coatings in accordance with all manufacturer’s recommendations. The Zinc Primer shall be touched up with only **Organic Zinc Primer** when applied in the field.

f) Warranty.

The fabricator and/or contractor will be required to guarantee his work against defective workmanship or the use of defective materials for a period of one (1) year from completion of the contract.

g) Handling Shop Primed Steel.

Only nylon web slings or padded lifting points shall be used to move shop primed steel to prevent damage to the coating.

Air Quality Requirements

Abrasive blasting operations shall be conducted in full compliance with all current **National primary and secondary ambient air quality standards 40 CFR 50** (for Particulate matter – 40 CFR 50.6; Lead – 40 CFR 50.12; and nuisance dust). Abrasive blasting operations shall also be compliant with any and all local state and air quality requirements.

Environmental Protection Statement

“All collection, containment, disposal and transportation for disposal must be compliant with all applicable State, Federal and Local air pollution, water pollution, solid waste and hazardous waste regulations, ordinances or statutes.”

Compensation

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All work covered by this section except for shop painting will be paid for at the contract lump sum price for "Painting of Structural Steel." Payment at the contract lump sum price for "Approx. 585,411 Lbs. Structural Steel" will be full compensation for the work of shop painting.

The above prices and payments will be full compensation for all work including but not limited to furnishing all paint, cleaning abrasives, cleaning solvents, and all other materials; protecting the work; protecting traffic and property; preparing and cleaning surfaces to be painted; applying paint in the shop and field; and furnishing blast cleaning equipment, paint spraying equipment, brushes, rollers, and any other hand or power tools, and any other equipment.