

UNDER STRUCTURE WORK PLATFORM

Description

Prior to any work on the structure, the Contractor shall design and install an understructure work platform which will be used to provide access to the structural work to be done, as well as serve as containment for the cleaning and painting of the bridge. The contractor shall determine the capacity of the platform which will be required, but the capacity shall not be less than that required by State or Federal regulations. The platform shall remain in place until all work is completed. Platform shall be constructed of materials capable of withstanding damage from any of the work required on this project. The platform shall be fireproof. Drawings of the platform and loads supported by the platform shall be sealed by a North Carolina Registered Professional Engineer. Submit drawings to the Engineer for approval prior to beginning work on the platform. Platform shall be cleaned after each work day to prevent materials from falling or washing into the river.

Measurement and Payment

There will be no measurement for payment.

Payment shall be at the lump sum price bid for the item *Under Structure Work Platform*. This price shall be full compensation for the design, installation, maintenance, and removal of the platform.

REPLACEMENT OF STEEL GRID FLOOR

Description

This work involves: the removal of the existing steel grid floor; grinding smooth of all existing welds attaching the grid floor to the main girders; and installing the new floor, including any necessary shimming. The new steel grid floor shall be A572, galvanized. The floor shall have studs welded to the grid, as shown on the plans, for skid resistance. All welds and areas of galvanizing damaged during the installation of the new steel grid floor shall be repaired in accordance with Section 1076 of the Standard Specification. E7018 electrodes shall be used. Grid shall be designed for HS20-44 loading. Plans and calculations shall be sealed by a Professional Engineer, registered in North Carolina, and shall be submitted for approval to the Engineer prior to beginning fabrication.

There is approximately 7625 square feet of steel grid flooring to be replaced. The Department desires to salvage panels of the existing steel grid floor equal to an area 26' x 30'. Sections of steel grid floor to be salvaged shall be stockpiled by the Contractor for pickup by NCDOT.

Quality Assurance

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

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

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

Submittals

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

Handling

Store fabricated grid and materials in a dry, protected, and well ventilated area, blocking grid and materials to maintain any prefabricated camber and/or design flatness.

Materials

The steel grid decking shall be 5" 4-way modified open steel grid. The decking shall consist of panels fabricated from A572 steel, in standard width of 7'-8". Narrower widths at the floor ends may be accepted with approval.

The steel grid decking shall consist of the following elements:

1. Main bars: 5-3/16" deep spaced at 7-1/2", and weigh 5.3 lbs./lf.
2. Cross bars: 2 1/2" x 1/4" spaced at 3-3/4" c-c
3. Supplemental bars shall be 1" x 1/4", one between the main bars.
4. Diagonal bars shall be 1" x 1/4", two between the main bars.
5. Bottom "C" bars shall be 5/8" round bars.
6. 5/16" diameter, 3/8" high studs shall be welded to the panels at the crossing as shown on the plans, prior to galvanizing.
7. End trim shall be provided at both ends of the span and where the new decking abuts the existing concrete filled grid.
8. Steel grid decking shall be galvanized according with ASTM A-123.
9. All steel shall be A-572, Grade 50.
10. Steel grid decking shall have a minimum section modulus of:
Stop = 4.038 inches cubed, S bot = 4.321 inches cubed

All elements shall be serrated on their top surfaces. Serration pattern shall be at maximum of 1" c-c. The grid deck shall provide a skid resistance number (S/N) of 53 at 30 mph (prior to stud installation) when tested in accordance with ASTM E274. Cost of testing shall be included in the bid price for the steel grid decking. The decking shall be assembled such that the top of all elements are in the same plane and notching (other than serrations) of the main beam grid beams at the top flange of main girders and roadway stringers will not be permitted. Notching of the bottom cross bars will not be permitted. The grid shall be welded at all intersections.

The steel grid decking shall be fabricated in accordance with Bridge Grid Flooring Manufacturer's Association tolerances. Tolerances between sections shall provide for no more than 1/4" clearance between adjacent sections.

Installation

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

Measurement and Payment

There will be no measurement for payment for this item.

Payment shall be at the lump sum price bid for the item *Replacement of Steel Grid Floor*. This price shall be full compensation for the removal of the old steel grid floor, grinding of the existing welds, preparing the existing steel to accept the new steel grid floor, and the design, fabrication, and installation of the new steel grid floor.

REPLACEMENT OF W16x40 STRINGERS

Description

This work involves the replacement of the nine lines of W16x40 roadway stringers (72 stringers) under the open sections of the grid floor. Replacement stringers shall be A572 or A588. They shall be installed with replacement A325 galvanized bolts. Where their flanges are coped at the floorbeams, the cope shall be carefully cut to the radius shown on the plans and be ground smooth. Lead abatement procedures in accordance with all State and Federal regulations and the Special Provision *Cleaning and Painting of Structure*, shall be performed prior to any work included in this item.

Measurement and Payment

There will be no measurement for payment for this item.

Payment shall be made at the lump sum price bid for the item *Replacement of W16x40 Stringers*. This price shall be full compensation for the removal of existing stringers, and fabrication and installation of the new stringers, including bolts and washers. Payment for lead abatement

procedures in preparation of the existing stringer removal and painting of the new stringers shall be included in the pay item *Cleaning and Painting Existing Structure*.

STRUCTURAL STEEL REPAIRS TO VARIOUS BRIDGE MEMBERS

Description

This work involves repairs to various bridge members by cutting out deteriorated sections of the members and replacing with new sections, plating over holes in members, and adding stiffener plates to sidewalk brackets and modification to the 1" diameter lateral bracing hangers. Repairs shall be made with A36 steel, unless shown otherwise on the plans. Welding shall be completed using E7018 low hydrogen electrodes. Lead abatement procedures in accordance with all State and Federal regulations and the Special Provision *Cleaning and Painting of Structure*, shall be performed prior to any work being undertaken on this item. Any bolts required shall be A325 galvanized.

Measurement and Payment

Measurement for payment for this item shall be the number of pounds of steel repair plates and steel sections installed. It shall include the stiffener plates required at the sidewalk brackets and any A325 bolts used in the repairs. Weld material will not be measured for payment but will be included in payment for repair plates.

Payment shall be at the unit price bid per pound for *Structural Steel Repairs to Various Bridge Members*, which shall be payment for all labor, equipment, and materials to cut out deteriorated areas to be repaired, preparation for installing repairs plates and sections, and installation of the repair plates and sections. Payment for lead abatement procedures in preparation of the repairs and painting of the repaired areas shall be included in the pay item *Cleaning and Painting Existing Structure*.

CAMBER MODIFICATION OF MAIN GIRDERS

Description

This work involves modifying the camber of the four main girders of the bridge by "Vee" heating (or other approved methods) of the girders to reduce the sag of the ends of the girders as shown on the plans. The Contractor shall submit to the Engineer for approval the procedure he intends to use to do the work. Being that the sag of the girders is somewhat temperature related, a procedure to monitor and correct for temperature effects, shall also be submitted for approval. Lead abatement procedures shall be performed prior to heating in accordance with all State and Federal regulations and the Special Provision *Cleaning and Painting of Structure*.

Qualifying to Perform Work

Only contractors who have successfully¹ completed at least three similar projects within the 24 months prior to this bid may perform this work. Contractor shall submit proof of meeting these requirements for approval, prior to beginning this work.

Heating Requirements

1. The heating patterns and torch paths will be laid out prior to application of heat. The heating steel temperature shall not exceed 1100 degrees F (590C). Monitoring of heating will be by heat sticks. Torch operator must be skilled and experienced to produce the results that are free of wrinkles, cracks, bulges, and poor alignment.
2. Cold Mechanical Straightening shall not be permitted on these girders. Minimal auxiliary force such as jacks and come-alongs may be used in conjunction with heating.
3. The opening width of "Vee" heats should be between 3" and 12" wide, and simultaneous "Vee" heats shall have a minimum spacing of 12 inches.

Effect of Heating

Contractor shall perform work in a manner which will not allow possible girder failure or adverse deformations.

Measurement and Payment

There will be no measurement for payment for this item.

Payment shall be made at the lump sum price bid for the item *Camber Modification of Main Girders*. This price shall include all labor, equipment, and materials to raise the ends of the four main girders by heating methods.

¹ Successfully: Work completed in accordance with contract specifications, free of citation from safety or environmental agencies. Payment for lead abatement procedures required prior to the heating process and painting of the heated areas shall be paid for under the item *Cleaning and Painting of Structure*.

REPAIR OF SIDEWALK BRACKET CRACKS**Description**

This work includes the repair of cracks in the sidewalk brackets by gouging out the crack, preparing the crack for welding, and welding the prepared crack. Lead abatement procedures in accordance with all State and Federal regulations and the Special Provision *Cleaning and Painting of Structure*, shall be performed prior to any work included in this item. Welding shall be completed using E7018 low hydrogen electrodes. **The Contractor shall provide a proposed repair and welding procedure to the Engineer for approval.**

Measurement and Payment

Measurement shall be made for the number of inches of cracks satisfactorily repaired.

Payment at the unit price per inch for the item of *Repair of Sidewalk Bracket Cracks* shall be full compensation for all labor, equipment, and materials needed to make the crack repairs. Payment

for lead abatement procedures required prior to the crack repairs, and painting of the repair areas shall be included in payment for the item *Cleaning and Painting of Structure*.

MODIFICATION TO SIDEWALK CURBS

Description

This work includes the removal of 3" of the bottom of the existing sidewalk curb, as shown on the plans. Work includes the removal of the curb material, grinding of the cut edge smooth, and welding the new steel grid floor to the modified curb, as shown on the plans. Work includes chipping away the concrete of the concrete filled grating to allow welding and patching back the removed concrete with an approved epoxy mortar. Lead abatement procedures in accordance with all State and Federal regulations and the Special Provision *Cleaning and Painting of Structure*, shall be performed prior to any work included in this item. Welding shall be completed using E7018 low hydrogen electrodes. The Contractor shall provide a proposed modification and repair procedure to the Engineer for approval.

Measurement and Payment

Measurement shall be made for the number of linear feet of curb satisfactorily modified.

Payment at the unit price bid for the item *Modification to Sidewalk Curbs* shall include all labor, equipment, and materials needed to modify the existing curbing. Payment for lead abatement procedures required prior to the work, and painting of the modified area shall be included in payment for the item *Cleaning and Painting of Structure*.

PROJECT SPECIAL PROVISIONS
CLEANING AND PAINTING OF STRUCTURE

GENERAL

This work shall consist of furnishing all labor, equipment, and materials to clean and paint the structural steel of the existing bridge. Work includes: removing, containment and disposal of the existing paint system; preparation of the surfaces to be painted; applying the new paint system; and portable lighting.

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.

All structural steel of the bridge shall be painted. All machinery that has been previously painted shall be painted. All machinery and other areas not to be painted shall be protected from blasting and painting. Equipment bearings, seals, and gear faces shall be sealed to keep out blasting medium and paint.

Paint on the bridge (regardless of color) contains lead and other hazardous constituents. All cleaning and surface preparation activities must prevent dispersion of debris into the environment.

The surface area to be painted is approximately 30,000 Sq. Ft. and may vary from the actual quantity to be painted. The Contractor is responsible for determining the actual area to be painted.

The Contractor shall immediately notify the Engineer of any OSHA or SSPC audits, and shall supply the NCDOT with a copy of any such audits.

SPECIAL**SSPC QP-2 CERTIFICATION**

The existing paint system includes 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 successfully¹ completed lead paint removal on similar structures within 18 months prior to this bid, may perform this work.

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

¹ Successfully: Work completed in accordance with contract specifications, free of citation from safety or environmental agencies.

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. Containment shall be capable of containing 100% of wash water.

In the containment plan describe how debris is 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, paint chips separated, and the water disposed of. Describe what physical containment will be provided during painting application to protect vehicles and areas not to be painted.

Waste Handling -Use *Southern Logistics, Inc. (336) 662-0292*, 312 Orvil Wright Blvd, Greensboro, NC 27409 (the current NCDOT contractor) to dispose of paint waste. Immediately after award of the contract, the Contractor arranges for waste containers, 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.

All removed paint shall be considered a hazardous waste. The Contractor has the option of furnishing the Engineer certified test reports showing Toxicity Characteristic Leaching Procedure (TCLP) results of the paint chips stored on site, with disposal being in accordance with "Flowchart on Lead Waste Identification and Disposal".

(<http://www.wastenotnc.org/hwhome/guidance/Lead%20Disposal.pdf>)

If the Contractor elects to have TCLP testing done, samples shall be taken from at least 10% of the barrels to be disposed of. 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 for waste shipment and disposal. The Engineer will verify the type and quantity of waste

and obtain a Temporary Waste Disposal Identification Number (TWDIN) from the NC Hazardous Waste Section.

NC Hazardous Waste Section
PO Box 27687, Raleigh, NC 27611-7687
(919) 733-2178 FAX (919) 733-4810

At the time of shipping the Engineer will sign, date and add the TWDIN in the appropriate section on the manifest. The cost for waste disposal (including any lab fees) is included in the bid price for this contract. Note NC Hazardous Waste Management Rules (15A NCAC 13A) for more information.

Wash water shall be contained and disposed of at the City of Washington Waste Water Treatment Plant. Each load of water disposed at this site shall have a Metals Analysis performed for the following metals:

Cadmium – EPA 200.8
Chromium – EPA 200.8
Nickel – EPA 200.8
Cyanide – EPA SM 4500 C & E
Lead – EPA 200.8
Copper – EPA 200.8
Zinc – EPA SM 3111B
Silver – EPA 200.8
Arsenic – EPA 200.8
Mercury – EPA 245.1
Selenium – EPA 200.8
Molybdenum – EPA 200.8

Samples for the test shall be taken prior to disposal, with test results submitted to the Engineer no later than 30 days after sampling.

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 January 1, 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 the Materials Section of this Special Provision.

PREPARATION OF SURFACES:

Prior to power washing, all grease and oils on areas to be painted shall be removed by solvent cleaning.

Power washing with low pressure water – Before any other surface preparation are conducted, all surfaces shall be power washed to remove dust, salts, and other contaminants.

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.

Before the contractor departs from the work site at the end of the work day, all debris generated during surface preparation is collected in approved containers.

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.

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.

All parts of the bridges not to be painted, and the travelling public, shall be protected from overspray.

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 (SP10 – near white).

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.

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 NCDOT's 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.

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.

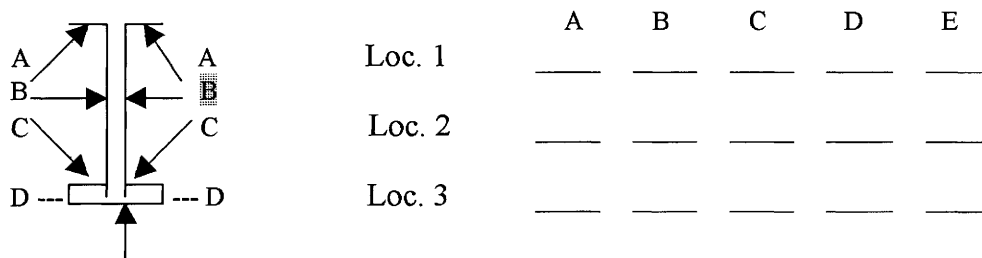
The contractor informs the Engineer of all scheduled and unannounced inspections from SSPC, OSHA, EPA and/or others that come on site.

Inspection Instruments - The Contractor furnishes 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 ^A
- Solvent Rub Test Kit – ASTM D-4752
- Adhesion Test Kit – ASTM D-3359 ^B

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.

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 **five** random spots per span on diaphragms/“K” frames. Each spot is an average of three to five readings in accordance with SSPC PA-2.



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

Two random adhesion tests per span are conducted on interior surfaces after the paint has been properly cured, and will be touched up by the Contractor. One random Cut Tape adhesion test per span is conducted on interior surface after the finish coat is cured, and will be touched up by the Contractor.

SAFETY AND ENVIRONMENTAL COMPLIANCE PLANS:

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

ENVIRONMENTAL MONITORING:

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

A "Competent Person²" 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 $\mu\text{g}/\text{m}^3$ TWA is justification to suspend the work. Before any work begins the Contractor provides a written summary of the responsible person's safety training.

HEALTH AND SAFETY RESPONSIBILITY:

Comply with Section 442-13(C) of NCDOT's Standard Specifications and insure employee blood lead results are less than 50 micrograms per deciliter. Remove employees with 50 or more micrograms per deciliter from work activities involving any lead exposure until the blood lead level drops below 50.

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.

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.

MEASUREMENT FOR PAYMENT:

There will be no measurement for payment.

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.

BASIS OF PAYMENT:

The cost of inspection, surface preparation and repainting the existing structure is included in the lump sum price bid for "Cleaning and Repainting of the Existing Structure". This price is full compensation for furnishing all inspection equipment, all paint, cleaning abrasives, cleaning solvents and all other materials; preparing and cleaning surfaces to be painted; applying paint in the field; protecting work, traffic and property; and furnishing blast cleaning equipment, paint spraying equipment, brushes, rollers and any other hand or power tools and any other equipment; containment, testing and disposal of wash water and debris, all personal protective equipment, and all personal hygiene requirements.

This price shall be full compensation for all inspection equipment, all materials and labor necessary to fully contain the wash water and blast debris; daily collection of the blast debris into the specified containers; and any measures necessary to ensure conformance to all safety and environmental regulations as directed by the Engineer.