

STATE OF NEW HAMPSHIRE

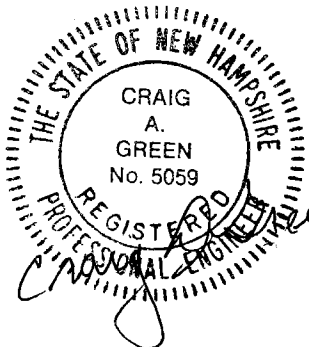
DEPARTMENT OF TRANSPORTATION

**CONCORD
13742C**

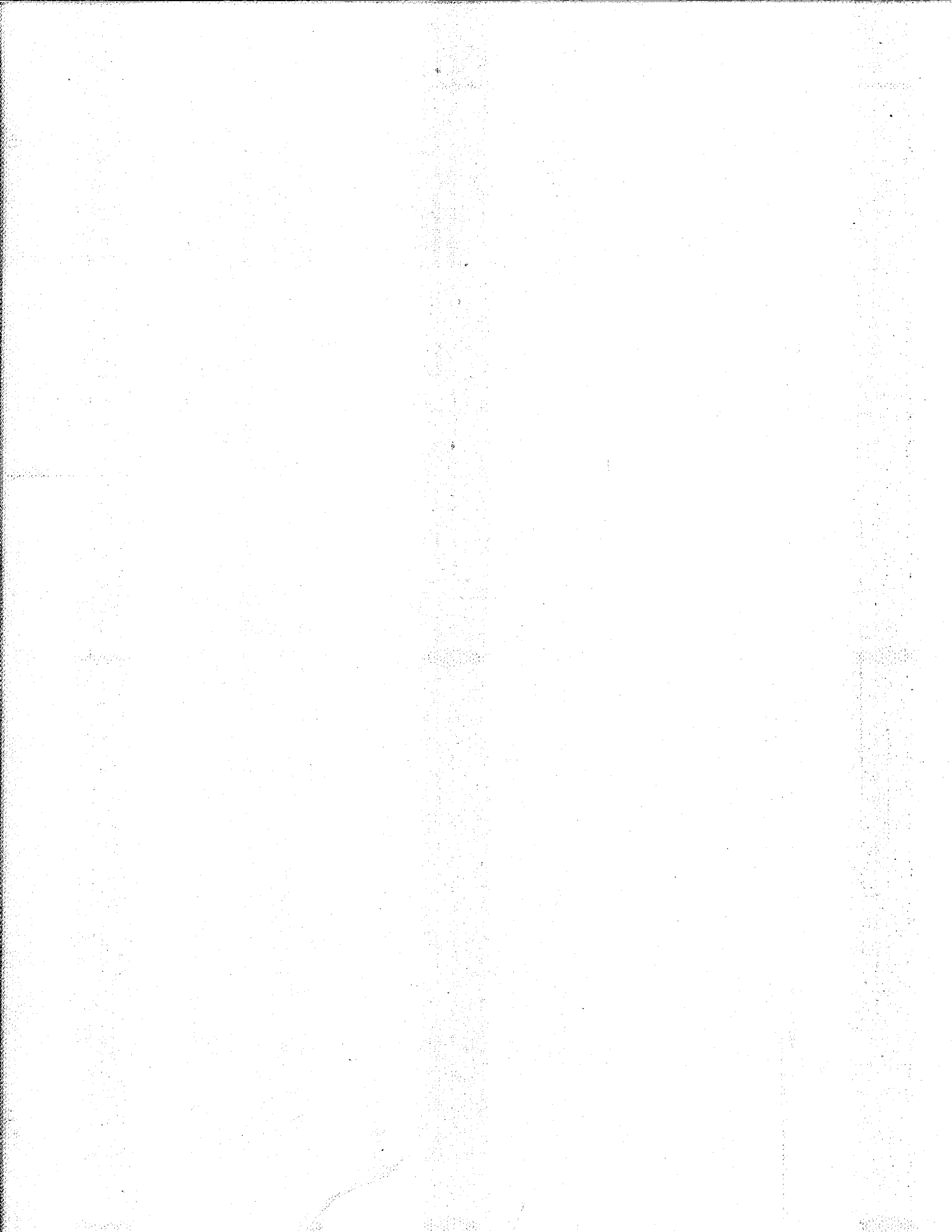
**THIS PROJECT INVOLVES THE REPLACEMENT OF THE EXISTING
CONCRETE DECK, AND REPAIRS TO THE ABUTMENT FACING, ON
BRIDGE NO. 163/106 THAT CARRIES I-93 (F.E. EVERETT TURNPIKE) OVER
LOUDON ROAD (NH ROUTE 9) AT EXIT 14**

**NOTE: PLANS AND SPECIFICATIONS ON THIS PROJECT CANNOT BE
TRANSFERRED TO ANY OTHER FIRM OR ORGANIZATION FOR THE
PURPOSE OF SUBMITTING A BID AS A GENERAL CONTRACTOR
WITHOUT THE KNOWLEDGE AND AUTHORITY OF THE DEPARTMENT.**

NON-TRANSFERABLE: _____



GRAND TOTAL \$ _____



06/30/04

Supersedes 4/26/00; 12/23/02

**CONCORD
13742C**

July 30, 2009

TABLE OF CONTENTS

Page Number

1

2 - 12

13 - 17

18 - 26

27 - 48

49 - 290

291

292- 309

310

Invitation to Bids

N.H. Dept of Employment Security, Office Address

Minimum Wage Rates (F.A. only)

Prosecution of Work

Traffic Control Plan (TCP)

Permits and/or Engineer Data (borings, etc.)

Special Attentions

Supplemental Specifications and Special Provisions

Sample Form FHWA-47 Statement of Materials & Labor (F.A. only)

Required Contract Provisions (F.A. only)

Proposal Form

Bid Schedule

Signature Pages

Bid Bond

THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

JOHN O. MORTON BUILDING
CONTRACT SECTION

INVITATION FOR BIDS

7 HAZEN DRIVE
POST OFFICE BOX 483
CONCORD, NH 03302

Sealed proposals are to be received and deposited in the Bid Box in Room 112, (small conference room) at the John O. Morton Building, at the address above by 2:00 o'clock PM, Eastern Time on **THURSDAY, SEPTEMBER 17, 2009** for the following project:

**CONCORD
13742C**

**THIS PROJECT INVOLVES THE REPLACEMENT OF THE EXISTING CONCRETE DECK, AND REPAIRS TO THE ABUTMENT FACING, ON BRIDGE NO. 163/106 THAT CARRIES I-93 (F.E. EVERETT TURNPIKE) OVER LOUDON ROAD (NH ROUTE 9) AT EXIT 14
CERTIFIED CHECK/BID BOND: \$50,000.00**

Unskilled labor may be hired from lists prepared by the NH Dept. of Employment Security designated in the proposal. Plans and specifications (**NOT FOR BIDDING PURPOSES**) may be seen at the office of Const. Industries of MA, Inc. 1500 Providence Hwy, Suite 14, Norwood, MA; at the office of the Assoc. General Contractors of NH, 48 Grandview Rd, Bow, NH; FW Dodge Corp. 880 Second Street, Manchester, NH, Const. Summary of NH, 734 Chestnut St., Manchester, NH, Const. Summary of ME, c/o Cross Insurance Bldg. 2331 Congress St., Portland, ME, Works in Progress 20 Farrell Street, Suite 103, So. Burlington, VT, Minuteman Press, 109 Gosling Road, Newington, NH, Signature Press & Blueprinting, Inc., 45 Londonderry Turnpike, Hooksett, NH, and Infinite Imaging, 30 International Drive, Suite 6, Portsmouth NH.

BIDDERS SHOULD ACT PROMPTLY AND SUBMIT ALL QUESTIONS ON THE PROJECT TO DONALD LYFORD AT (603) 271-2171 AT LEAST FIVE (5) DAYS BEFORE THE HOUR AND DATE SET FOR THE BID OPENING

Plans, specifications and proposal forms, **FOR BIDDING PURPOSES**, shall only be obtained at the Contract Office of the Department of Transportation for **THIRTY-FIVE DOLLARS (\$35.00)** for plans and specifications **NON-REFUNDABLE**. An additional **FIVE DOLLARS (\$5.00)** will be charged for shipping fees **NON-REFUNDABLE**. Bidders must obtain a proposal form from the Department of Transportation to be eligible for bidding. Checks should be made payable to "Treasurer, State of New Hampshire". Send check with project name & No to the Dept. of Transportation, c/o Finance & Contracts, P.O. Box 483, Hazen Drive, Concord, NH 03302.


Proposals must be completed in both words and figures on forms furnished by the Department, or on previously-approved, substantially-identical forms generated by computer software, which shall be submitted in a sealed envelope marked: "Proposal for: **CONCORD 13742C**" and received by the Dept. of Transportation as specified no later than the date and time mentioned above, at which time they will be publicly opened and read aloud. Proposals must be accompanied by a certified check or bid bond in the amount listed above, payable to "Treasurer, State of New Hampshire" as security for the execution of the contract.

All individuals, firms, partnerships or corporations intending to bid, before obtaining plans, specifications and proposal forms, must file with the Department of Transportation on forms prepared for that purpose at least ten (**10**) days prior to opening of bids, a statement showing their qualifications. No valid bidding proposal will be issued to a prospective bidder who is **not** prequalified.

If contract price is \$35,000 or more, the successful bidder will be required to furnish a contract bond in the amount of one hundred (100) percent of their bid on forms furnished by the Department.

The right is reserved to waive any informalities in or to reject any or all proposals.

AUGUST 25, 2009
NF


William J. Cass, P.E.,
Director of Project Development

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

INFORMATION REPORT

PROJECT: CONCORD
13742C

COUNTY AND CODE: MERRIMACK 013

DATE BIDS OPEN: September 17, 2009

SCOPE OF WORK: ROADWAY AND BRIDGE REHABILITATION

LOCATION: BRIDGE NO. 163/106 THAT
CARRIES I-93 OVER LOUDON
ROAD AT EXIT 14
MANDATORY PRE-BID MEETING IS SCHEDULED
FOR THURSDAY, SEPTEMBER 10, 2009
AT 9:00, ROOM 112/113, JO MORTON
BUILDING, CONCORD NH

COMPLETION DATE: October 15, 2010

PROPOSAL GUARANTEE: 50,000.00

FEDERAL PARTICIPATION: NONE

ESTIMATED QUANTITIES

TURNPIKE EXPANSION (State FY)

ITEM NUMBER	ITEM DESCRIPTION	UNIT	QUANTITY
202.6	CURB REMOVAL FOR STORAGE	LF	4,000.
202.7	REMOVAL OF GUARDRAIL (F)	LF	10,400.
203.1	COMMON EXCAVATION	CY	4,500.
203.2	ROCK EXCAVATION	CY	600.
203.5554	GUARDRAIL 50' EAGRT PLATFORM	U	3.
214.	FINE GRADING	U	1.
304.1	SAND (F)	CY	1,100.
304.32	CRUSHED GRAVEL FOR SHOULDER LEVELING	TON	50.
304.4	CRUSHED STONE (FINE GRADATION) (F)	CY	1,650.
304.5	CRUSHED STONE (COARSE GRADATION) (F)	CY	1,400.
403.11092	HOT BITUMINOUS PAVEMENT, MACHINE METHOD (QC/QA TIER 2) (NIGHT)	TON	5,650.

403.1199	HOT BITUMINOUS PAVEMENT, MACHINE METHOD, HIGH STRENGTH (NIGHT)	TON	350.
403.129	HOT BITUMINOUS PAVEMENT, HAND METHOD (NIGHT)	TON	110.
403.6	PAVEMENT JOINT ADHESIVE	LF	29,400.
403.99	TEMPORARY BITUMINOUS PAVEMENT	TON	940.
411.19	HOT BITUMINOUS CONCRETE LEVELING COURSE (NIGHT)	TON	1,050.
417.19	COLD PLANING BITUMINOUS SURFACES (NIGHT)	SY	8,400.
417.52	COLD PLANING EXISTING RUMBLE STRIPS, 1" DEPTH	LF	3,250.
603.00215	15" R.C. PIPE, 2000D	LF	78.
604.0007	POLYETHYLENE LINER	EA	54.
604.12	CATCH BASINS TYPE B	U	13.
604.4	RECONSTRUCTING/ADJUSTING CATCH BASIN & DROP INLET	LF	41.
606.120	BEAM GUARDRAIL (STANDARD SECTION-STEEL POST)	LF	4,950.
606.1454	BEAM GUARDRAIL (TERM. UNIT TYPE EAGRT 50 FT.)	U	3.
606.147	BEAM GUARDRAIL (TERMINAL UNIT TYPE G-2)	U	4.
606.21203	DOUBLE-FACED BEAM GUARDRAIL (GALVANIZED) THRIE BEAM (STEEL POST)	LF	8,000.
606.3223	DOUBLE FACED TRANSITION RAIL TO THRIE BEAM, STEEL POST	U	5.
606.402	CONCRETE BARRIER, DOUBLE- FACED	LF	200.
606.41231	TRANSITION SINGLE SLOPE CONCRETE BARRIER, PRECAS INCLUDE. TRANS. SECTION	U	5.
606.417	PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL	LF	3,000.
606.9523	TEMP. IMPACT ATTENUATION DEVICE (NON-REDIRECTIVE), TEST LEVEL 3	U	1.
609.01	STRAIGHT GRANITE CURB	LF	130.
609.5	RESET GRANITE CURB	LF	2,150.
609.811	BITUMINOUS CURB, TYPE B (4" REVEAL)	LF	3,200.
615.04	TRAFFIC SIGN TYPE AA (F)	SF	370.
616.161	TRAFFIC SIGNALS (TEMP.)	U	1.
616.162	TRAFFIC SIGNALS (TEMP.)	U	1.
616.191	ALTERATIONS TO TRAFFIC SIGNALS	U	1.
616.451	TRAFFIC SIGNALS REMOVAL AND REINSTALLATION	U	2.
616.650	TRAFFIC SIGNAL DETECTOR LOOP 6 FT X 50 FT	EA	4.

618.61	UNIFORMED OFFICERS WITH VEHICLE		AS SHOWN IN PROPOSAL
618.7	FLAGGERS	HR	500.
619.1	MAINTENANCE OF TRAFFIC	U	1.
619.253	PORTABLE CHANGEABLE MESSAGE SIGN (UNIT WEEK)	UWK	44.
619.27	TRAILER-MOUNTED SPEED LIMIT SIGN	U	2.
619.63	TRUCK-MOUNTED IMPACT ATTENUATOR, TEST LEVEL 3	EA	2.
621.1	RETROREFLECTIVE MEDIAN BARRIER DELINEATOR	EA	15.
621.2	RETROREFLECTIVE BEAM GUARDRAIL DELINEATOR	EA	235.
628.2	SAWED BITUMINOUS PAVEMENT	LF	760.
632.0106	RETROREFLECTIVE PAINT PAVE. MARKING, 6" LINE	LF	40,400.
632.0112	RETROREFLECTIVE PAINT PAVE. MARKING, 12" LINE	LF	3,200.
632.1106	PREFORMED RETROREFLECTIVE TAPE, TYPE I (REMOVABLE) 6" LINE	LF	43,900.
632.3118	RETROREFLECT. THERMOPLAS. PAVE. MARKING, 18" LINE	LF	58.
632.32	RETROREFLECT. THERMOPLAS. PAVEMENT MARKING, SYMBOL OR WORD	SF	320.
643.21	FERTILIZER FOR REFERTIL- IZATION	LB	27.
645.531	SILT FENCE	LF	200.
645.7	STORM WATER POLLUTION PREVENTION PLAN	U	1.
645.71	MONITORING SWPPP AND EROSION AND SEDIMENT CONTROLS	HR	100.
646.31	TURF ESTABLISHMENT WITH MULCH AND TACKIFIERS	SY	150.
647.1	HUMUS	CY	15.
670.045	CONSTRUCT AND REMOVE TEMPORARY DETOUR	U	1.
670.104	TEMPORARY LIGHTING (PORTABLE)	U	2.
670.5	TEMPORARY SHUTTLE SERVICE	HR	82.
692.	MOBILIZATION	U	1.
698.12	FIELD OFFICE TYPE B	MON	7.
698.2	PHYSICAL TESTING LABORATORY	MON	7.
699.	MISCELLANEOUS TEMPORARY EROSION AND SEDIMENT CONTROL		AS SHOWN IN PROPOSAL
1008.11	ALTERATIONS AND ADDITIONS AS NEEDED- UNANTICIPATED WORK		AS SHOWN IN PROPOSAL

1009.11	HEALTH AND SAFETY PLAN (MICROBIAL)	AS SHOWN IN PROPOSAL
1010.15	FUEL ADJUSTMENT	AS SHOWN IN PROPOSAL
1010.2	ASPHALT CEMENT ADJUSTMENT	AS SHOWN IN PROPOSAL
1010.3	QUALITY CONTROL QUALITY ASSURANCE (QC/QA) ASPHALT	AS SHOWN IN PROPOSAL

TURNPIKE EXPANSION (State FY)

ITEM NUMBER	ITEM DESCRIPTION	UNIT	QUANTITY
209.4	GRANULAR BACKFILL (GRAV)	CY	31.
403.911	HOT BITUMINOUS BRIDGE PAVEMENT, 1" BASE COURSE (F)	TON	47.
502.	REMOVAL OF EXISTING BRIDGE STRUCTURE	U	1.
504.1	COMMON BRIDGE EXCAVATION (F)	CY	37.
512.0101	PREPARATION FOR CONCRETE REPAIRS, CLASS I	SY	50.
512.0201	PREPARATION FOR CONCRETE REPAIRS, CLASS II	SY	100.
520.01	CONCRETE CLASS AA	CY	15.
520.7006	CONCRETE BRIDGE DECK (HIGH EARLY STRENGTH) (F)	CY	52.
520.70061	CONCRETE BRIDGE DECK (HIGH EARLY STRENGTH) (ACC. BRIDGE CONST.) (F)	CY	20.
528.62	PRECAST CONCRETE DECK PANELS, POST-TENSIONED (F)	SF	6,755.
534.1	WATER REPELLENT (LINSEED OIL)	GAL	20.
534.3	WATER REPELLENT (SILANE/ SILOXANE)	GAL	20.
538.2	BARRIER MEMBRANE, VERTICAL SURFACES (F)	SY	77.
538.6	BARRIER MEMBRANE, WELDED BY TORCH, MACHINE METHOD (F)	SY	765.
541.5	PVC WATERSTOPS, NH TYPE 5 (F)	LF	83.
544.2	REINFORCING STEEL, EPOXY COATED (F)	LB	10,914.

547.	SHEAR CONNECTORS (F)	EA	3,168.
548.21	ELASTOMERIC BEARING ASSEMBLIES (F)	EA	12.
550.191	TEMPORARY GIRDER SUPPORT SYSTEM	U	1.
556.101	PAINTING EXISTING STRUCTURAL STEEL	U	1.
556.201	CONTAINMENT AND ENVIRONMENTAL PROTECTION	U	1.
556.301	WORKER PROTECTION	U	1.
556.401	WASTE MANAGEMENT	U	1.
560.1	PREFABRICATED COMPRESSION SEAL EXPANSION JOINT (F)	LF	86.
562.1	SILICONE JOINT SEALANT (F)	LF	30.
563.223	BRIDGE RAIL T2 WITH SNOW SCREENING (F)	LF	320.
565.222	BRIDGE APPROACH RAIL, T2 (STEEL POSTS) (F)	LF	117.
606.4175	PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL - ANCHORED	LF	200.
615.30001	BRIDGE MOUNTED TRAFFIC SIGN STRUCTURE	U	1.
615.30002	BRIDGE MOUNTED TRAFFIC SIGN STRUCTURE	U	1.
615.30003	BRIDGE MOUNTED TRAFFIC SIGN STRUCTURE	U	1.
615.30004	BRIDGE MOUNTED TRAFFIC SIGN STRUCTURE	U	1.
1002.1	REPAIRS OR REPLACEMENTS AS NEEDED		AS SHOWN IN PROPOSAL
1010.5	COMPLETION INCENTIVE/ DISINCENTIVE		AS SHOWN IN PROPOSAL

**NEW HAMPSHIRE DEPARTMENT OF EMPLOYMENT SECURITY
EMPLOYMENT OF NEW HIRES**

The following is a list of the local State Employment Security Office's from which the Contractor may secure the unskilled labor for this project is:

Department of Employment Security
151 Pleasant Street, PO Box 159
Berlin, NH 03570-0159
Telephone: (603) 752-5500

Department of Employment Security
PO BOX 180
Claremont, NH 03743-0180
Telephone: (603) 543-3111

Department of Employment Security
10 West Street, PO Box 1140
Concord, NH 03301-1140
Telephone: (603) 228-4100

Department of Employment Security
3 Plaza Drive, PO Box 457
Dover, NH 03820-0457
Telephone: (603) 742-3600

Department of Employment Security
109 Key Road
Keene, NH 03431-3926
Telephone: (603) 352-1904

Department of Employment Security
426 Union Avenue, STE 3
Laconia, NH 03246-2894
Telephone: (603) 524-3960

Department of Employment Security
85 Mechanic Street
Lebanon, NH 03766-1506
Telephone: (603) 448-6340

Department of Employment Security
646 Union Street, STE 100
Littleton, NH 03561-5314
Telephone: (603) 444-2971

Department of Employment Security
300 Hanover Street
Manchester, NH 03104-4957
Telephone: (603) 627-7841

Department of Employment Security
33 Pine Street
Nashua, NH 03060-3285
Telephone: (603) 882-5177

Department of Employment Security
2000 Lafayette Road
Portsmouth, NH 03801-5673
Telephone: (603) 436-3702
Department of Employment Security
518 White Mountain Hwy.
Conway, NH 03818-4205
Telephone: (603) 447-5924

Department of Employment Security
29 S. Broadway
Salem, NH 03079-3026
Telephone: (603) 893-9185
Department of Employment Securities
243 Route 108
Somersworth, NH 03878
Telephone: (603) 742-3600

**CONCORD
13742C**

August 19, 2009

PROSECUTION OF WORK

DESCRIPTION OF WORK

This project involves the replacement of the existing concrete deck, and repairs to the abutment facing, on Bridge No. 163/106 that carries I-93 (F. E. Everett Turnpike) over Loudon Road (NH Route 9) at Exit 14. The project also includes replacement of the existing median guardrail beginning approximately 3,950 feet south of the Exit 14 bridge and continuing north approximately 5,300 feet. The work also includes the construction of an additional 3,300 feet of median guardrail that begins approximately 3,950 feet south of the Exit 14 bridge and continues south to a point approximately 1,350 feet south of the I-93 bridge over Manchester St. (US Route 3) at Exit 13. The work also includes a pavement overlay of I-93 NB and SB beginning approximately 2,700 feet south of the Exit 14 bridge and continuing north approximately 3,600 feet to a point approximately 900 feet north of the bridge. The pavement overlay also includes the entire length of the NB off ramp and a portion of the SB on ramp, beginning at the ramp nose at I-93 and continuing northerly approximately 270 feet. Additional work includes replacement of the bridge rail, replacement of beam guardrail, and minor drainage construction and adjustments in the median.

NOTIFICATIONS AND PUBLIC INFORMATION

The Contractor shall be required to be in close coordination with the City of Concord (Ed Roberge, P.E., City Engineer at (603) 225-8520) and the public relative to the schedule and progress of work. Per Section 107.06 (Public Convenience and Safety), this coordination with the noted officials and public shall include notification by press release and flyer handouts of ongoing construction operations, impacts to traffic, and construction related information on a weekly basis, specifically to businesses that may be most directly affected by the construction operations. The Contractor shall coordinate with the Contract Administrator in determining the extent of the area impacted by the project and limits of abutters requiring notification. The development of the notification materials and coordination with local officials and business owners shall be subsidiary to Item 619.1 - Maintenance of Traffic.

NOTICE OF MANDATORY PRE-BID MEETING

Refer to the Section 102 Special Attention for more detailed information for prospective Bidders on the mandatory pre-bid meeting.

CONCURRENT WORK

The Department has previously advertised and will advertise construction projects that will take place during the life of this contract. Cooperate and coordinate with all other concurrent contracts.

Project	Anticipated Beginning	Anticipated Completion	Description
Concord 15645	July 2009	October 2010	I-93 Resurfacing & deck rehabilitation of bridges over the Merrimack River

Concurrent projects have included provisions not to perform any work or have any traffic control operations in place that may conflict with the time frames to be determined for Concord 13742C bridge deck construction and/or with the traffic control required for bridge deck construction as instructed in their respective documentation.

Due to the complex and overlapping nature of the traffic control for the various projects within the area, the Department will arrange at least one coordination meeting early in the construction schedule to be held with adjacent Contractors in the immediate area and appropriate Department personnel. Attend this meeting and provide the following:

- Schedules of work activities
- Anticipated state of the project at critical stages of traffic control within the area
- Provisions to meet requirements to accommodate the other projects' traffic control
- Any other related information needed to effectively coordinate traffic control between the projects.

Attendance at other meetings between the Contractors for further traffic control coordination may be required as directed.

Refer to 105.07 specifically regarding coordination with other Contractors working concurrently. Do not duplicate construction signs. Cover, uncover, or remove permanent signs as necessary (subsidiary to Item 619.1) to provide proper signing through the area.

UTILITIES

The following information is provided as a supplement to and in accordance with 105.06, Cooperation with Utilities. Notification and work time frames are as provided and estimated by Unutil Energy Systems.

There are utility installations in the area belonging to, but not necessarily limited to, the following:

Unutil Energy Systems
 Contact: Chuck Lloyd
 Phone: 603-227-4520
 Email: Lloyd@unitil.com

National Grid (Keyspan-gas)
 Contact: Mellissa Owens
 Phone: 603-781-907-2845
 Email: melissa.owens@us.ngrid.com

FairPoint Communications
 Contact: Serge Laprise
 Phone: 603-645-2721
 Email: slaprise@fairpoint.com

Concord Fire Department
 Contact: Richard Wollert
 Phone: 603-225-8667
 Email: rwollert@onconcord.com

Comcast
 Contact: Timothy Dent
 Phone: 889-6718 ext. 516
 Email: timothy_dent_@cable.comcast.com

Concord Services Department (City Water & Sewer)
 Contact: Ed Roberge
 Phone: 603-225-8520
 Email: eroberge@onconcord.com

Aerial:

Unitil Energy is responsible for maintenance of the utility poles and with 4 weeks advance notice by the Contractor, will need 2 days to install orange warning markers on the northerly and southerly lines to provide crane operators with a visual indication as to the location of the overhead lines over I-93, which will remain in service. All Supervisors/ Supervising parties associated with the crane work as well as crane operators will be on site and attend an electric safety meeting. The Contractor shall coordinate this meeting. Unitil will conduct the part that is specific to the clearances on aerial lines.

The Contractor is advised to use caution when working near aerial power distribution and transmission wires, as well as underground power distribution and service wires. Contact the appropriate utility for the precautionary measures required.

Underground:

Several underground facilities are located within the project area as shown on the plans. The Contractor is advised to use extreme caution while working in these areas.

Permanent Lighting:

The Contractor may temporarily remove the existing lighting and related traffic signals for the Loudon Road decking work, as shown on the plans. Provide 2 weeks advance notification to Unitil Energy for de-energizing the power to the aluminum poles and traffic signals prior to removal. If the traffic signals are removed, the Contractor shall construct temporary signals in its place (see also section entitled "Temporary Traffic Signals"). The temporary signals can be turned off and removed during the weekend closures, but must be operational by the end of the each weekend closure period. The permanent lighting shall be operational by the end of the second weekend closure period. Existing lighting or temporary lighting shall remain operational until permanent lighting is installed and operational.

Temporary Lighting:

Provide and maintain temporary lighting (Item 670.104) in conjunction with portable concrete barrier as shown on the Traffic Control Plans or as directed. When portable concrete barrier is installed other than required on the plans, provide temporary lighting as directed at the Contractor's expense.

EXCAVATING, DREDGING OR FILLING STATE WATERS

No Wetlands Permit is required for the work shown. For any work not shown that the Contractor needs to do in, or adjacent to, wetlands or waters of the State, make appropriate application along with the necessary plans to the Wetlands Bureau, and, if necessary, to the Corps of Engineers sufficiently in advance for their consideration and approval.

Contact Kevin Nyhan of the Bureau of Environment (603) 271-3226 for clarification of wetlands limits, if necessary.

EROSION CONTROL AND WATER QUALITY MANAGEMENT

Provide a Storm Water Pollution Prevention Plan (SWPPP) (Item 645.7) and monitoring of the SWPPP (Item 645.71) to assure that any detrimental impacts are minimized to the extent practical and restricted to the construction phase. Take note of the requirements in the Supplemental Specification for Section 645- Erosion Control, particularly 3.1.1 regarding submittals and approvals of the SWPPP prior to specific work. Amend the SWPPP as necessary to provide for continued erosion and sediment control. Implement appropriate temporary measures as necessary to prevent erosion based upon the Contractor's method of operation and schedule.

Before beginning earthwork, install erosion control measures in areas adjacent to or at outfalls to wetlands or other areas as directed. In addition, provide delineation (i.e. fluorescent painted stakes or fluorescent colored flags, subsidiary to Item 645.531) at the limits of construction adjacent to wetlands or other restricted areas or as directed. Maintain the Storm Water Pollution Prevention Plan measures throughout construction until the area is stabilized.

EPA STORM WATER DISCHARGE

Refer to the Special Attention concerning the Contractor's obligation relative to the National Pollutant Discharge Elimination System (NPDES) Storm Water Construction General Permit as administered by the Environmental Protection Agency (EPA). This project is subject to Notice of Intent, Notice of Termination and other project records to be completed by the Contractor as required in the Construction General Permit (CGP). NPDES General Guidelines, Notice of Intent and Notice of Termination forms are available on line in the Business Center at www.nhdot.com or through the NHDOT Contracts office.

INVASIVE SPECIES

Under the statutory authority of RSA 430:55, the NH Department of Agriculture prohibits the spread of invasive plants listed on the NH Prohibited Species List. The invasive plant, Japanese knotweed, is known to occur along the I-93 corridor in Concord. As proposed, work does not require the clearing or cutting of vegetation along the corridor.

If the Contractor's method of construction involves any clearing or cutting of vegetation along the corridor, the Bureau of Environment shall be contacted prior to the clearing or cutting to determine if any Japanese knotweed, or other invasive plant is present, and to determine an appropriate treatment method. Contact Kevin Nyhan or Christine Perron at (603) 271-3226 at least 2 weeks in advance of the work for clarification of the limits of invasive plants.

TEMPORARY TRAFFIC SIGNALS

Item 616.16X – Traffic Signals (Temp.) is included in the contract in the event that the Contractor removes the existing signals at the intersection of Loudon Road and the Exit 14 NB on ramp and/ or at the intersection of Loudon Road and the Exit 14 SB on and off ramps for the deck replacement work. If utilized, the temporary signals can be turned off and removed during the weekend closures, but must be operational by the end of each weekend closure period.

RIGHT-OF-WAY AND PROTECTION OF PROPERTY

The proposed work is contained within the Right of Way. The Contractor shall not perform any work that has impacts beyond the Right of Way considering the following:

The Contractor shall obtain permission from the property owner for placing construction signs (including detour-directional signs) on any private property. See Plans for sign locations and notes.

EXISTING BRIDGE PLANS

Prospective bidders may review the existing bridge plans by appointment at the Department's Bureau of Bridge Design Office (603) 271-2731 during the bidding period. (Br. No. 163/106, Files 19-4-2 original & 35-4-1 joint rehabilitation)

A set of prints of the existing bridge plans will be forwarded to the successful bidder upon request.

MAINTAINING CONDITION OF THE EXISTING BRIDGE

The Contractor shall take care not to gouge or damage bridge components during the performance of all work activities. The use of "softeners" or protective devices may be necessary. The Contractor shall repair any damage which may occur to the bridge as a result of work operations to the satisfaction of the Department and at the Contractor's expense.

BRIDGE CONSTRUCTION

Bridge construction over Loudon Road includes deck removal and replacement (replace the deck using Accelerated Bridge Construction (deck panels)), bridge shoe replacement, bridge rail construction, steel painting, and abutment facing repairs.

The Contractor shall remove the screening underneath the existing bridge and clean the bird guano underneath the bridge prior to the work (including, but not limited to, bridge deck removal, abutment face preparations for abutment repairs, and cleaning of bridge stringers). This work shall be subsidiary to Item 502. – Removal of Existing Bridge Structure. The remediation of the bird guano shall be performed by a licensed professional and follow all Federal and State regulations and requirements. Provide for documentation a Health and Safety Plan (Microbial) (Item 1009.11) prior to applicable work that may encounter bird guano.

NOTICE OF SHEAR CONNECTOR BACK-UP EQUIPMENT

See the Special Provision for Section 547 relating to the need for spare stud welding equipment and an additional operator.

BRIDGE PAINTING

Contractor's Means & Methods

The Contractor's means and methods for performing the work shall include the following requirements:

6

- a) Perform bridge painting only during the night-time hours of 9:00 pm to 6:00 am.
- b) Bridge-to-grade tarp containments are not permitted. Use rapid-deployment units. See Special Provision for Item 556, Painting Existing Structural Steel, Part I, Section 2.3.3.
- c) Do not position equipment on the bridge deck for cleaning and painting operations. Only limited work is permitted from the bridge deck, e.g. to seal containment at the deck level.

Notice Of Bridge Painting Quality Assurance Inspection

The Contractor is advised that the Department will perform quality assurance inspection during the project with a contracted NACE certified coating inspector. All bridge painting is subject to inspection and approval by the Department.

Bridge Painting Air Quality Permit

The requirement for a temporary permit issued by the NH Department of Environmental Services (NHDES) Air Resources Division (ARD) for bridge painting has been waived. Nevertheless, the Contractor shall notify the NHDES ARD (Tel. 603-271-1370, Fax -1381) of the start up schedule at least two weeks prior to commencement of the work and send them a completed Bridge Painting Report Form (located elsewhere in the Proposal).

Bridge Painting Hazardous Waste Requirements

The Contractor shall ensure that the project is properly identified on the Manifest. Use the sample Manifest in the contract documents as a guide.

MAINTENANCE OF PEDESTRIAN AND BICYCLE TRAFFIC

The Contractor shall provide a temporary shuttle service (paid under Item 670.5 – Temporary Shuttle Service) for transporting pedestrians and bicyclists during the closure periods of Loudon Road under I-93. See the Special Provision located elsewhere in the proposal for more information.

PRE-SURVEY MEETING

NHDOT will hold a pre-survey meeting to discuss survey responsibilities and scheduling and to review Section 105.08 prior to the commencement of work.

GEOTECHNICAL INFORMATION

To assist the Contractor in preparing a bid, there are boring logs in the area of the existing bridge. These show conditions at boring points only and do not necessarily indicate all the materials that may be encountered during this construction.

7

CONSTRUCTION REQUIREMENTS

1. Specific to the Concord 13742C project, the Exit 14 bridge sections will be closed for two (non-consecutive) weekends, SB then NB, during the period of April 2 to May 24, 2010, inclusive. Median crossover detours will be utilized to shift traffic to the opposing barrels.
2. To accommodate the bridge construction, traffic will be confined to a 1-lane/2-lane configuration accommodating traffic volumes on the barrel opposite the bridge deck replacement work. Single lanes in each direction on I-93 at Exit 14 during those weekends will only be allowed for the shifting of concrete barrier from Saturday night into Sunday morning as allowed in the Maintenance of Traffic section of the TCP.
3. Square up the cold planing and paving full width in each barrel prior to the end of each daily work period and restore traffic to its normal patterns prior to the non-work hours.
4. Pave all cold-planed surfaces to the top of binder course prior to the weekend.
5. In order to regrade the median and install the double-faced thrie beam guardrail, it is anticipated that the work would not be completed such that the permanent installation, including appropriate terminal units, can be completed during a single work period. Accordingly, protect traffic from impacting the uncompleted end of the new rail with a temporary impact attenuator (Item 606.9523) or by overlapping the new thrie beam beside the existing rail or barrier as approved before the completion of work each day. Overlapping of the rail will not be allowed through the NHMS race dates.
6. Replace existing traffic signal loop detectors (Item 616.650) made inoperative by the pavement inlays or by cold planing for pavement matches by the end of the same work period they are made inoperative or otherwise provide temporary actuation of the signals, subsidiary to Item 616.650. Maintain normal signal operations outside of the bridge construction time periods.
7. Perform night work as indicated elsewhere in the Prosecution of Work and Traffic Control Plan. For those items that do not indicate night work but the work needs to be done at night, comply with all requirements associated with night work at no additional payment.
8. The Contractor shall take whatever precautions are necessary to accommodate the weather to complete the bridge deck replacement within the specified closure periods. Coordinate the work with District 5 Maintenance forces (Pamela Mitchell, District 5 Maintenance Engineer (603) 666-3336), as necessary.
9. Apply pavement joint adhesive (Item 403.6) to all longitudinal joints of all pavement that is paid under Item 403.11092.

WORK HOURS

The Kiwanis Fair is currently scheduled for the weekend of May 13th – May 16th, 2010 at the Douglas N. Everett Arena on Loudon Road. Take additional measures to make the City officials and public aware of the construction prior to the Kiwanis Fair. This shall include notification by

press release, use of detour signage, and information regarding the shuttle service to accommodate pedestrians and bicycles. In addition to the Limitation of Work requirements described in 108.04, do not perform any work during other special events scheduled by the City of Concord, unless otherwise approved. Contact Thomas Aspell Jr., City Manager at (603) 225-8570 for special events. Additionally, NASCAR race weekends at the New Hampshire Motor Speedway (NHMS) are currently scheduled for June and September, and "Motorcycle Week", including the Laconia Classic Motorcycle Races, is held annually in June. See the Traffic Control Plan for additional information relative to these events.

Maintenance of Traffic (See also Traffic Control Plan)

1. The NB and SB bridges at Exit 14 will (alternately) be closed on non-consecutive weekends beginning Friday, April 2, 2010 at 7:00 PM through Monday, May 24, 2010 at 7:00 AM for the construction of the deck replacement. The bridges will be closed beginning Friday evening at 7:00 PM to the following Monday morning at 7:00 AM. During this time period, Interstate traffic will be limited to the following lane use:
 - a. Friday 7:00 PM to Saturday 10:00 PM – 2 lanes NB and 1 lane SB
 - b. Saturday 10:00 PM to Sunday 6:00 AM – 1 lane NB and 1 lane SB (An additional lane is needed to shift the barrier to accommodate the next traffic pattern).
 - c. Sunday 6:00 AM to Sunday 10:00 PM – 1 lane NB and 2 lanes SB
 - d. Sunday 10:00 PM to Monday 7:00 AM – 1 lane NB and 1 lane SB (An additional lane is needed to move the barrier to reopen I-93 to 4 lanes).
2. A northbound lane of I-93 may be closed Sunday through Thursday, 8:00 pm to 6:00 am. A southbound lane of I-93 may be closed Monday through Friday, 8:00 pm to 6:00 am.
3. The Exit 14 NB off ramp and SB on ramp will be closed at night to complete the paving operations. One ramp may be closed at a time. Closures will be allowed as follows:
 - a. NB off ramp
 - i. 8:00 PM to 6:00 AM Monday through Friday
 - ii. 8:00 PM to 7:00 AM Saturday and Sunday (Non-Holidays)
 - b. SB on ramp
 - i. 8:00 PM to 7:00 AM Monday through Friday
 - ii. 7:00 PM to 7:00 AM Saturday and Sunday (Non-Holidays)

- c. The Contractor shall provide adequate detour signage (subsidiary to Item 619.1 – Maintenance of Traffic) to direct motorists to Exit 15 during the closure of the NB off ramp, and to Exit 13 during the closure of the SB on ramp. Use Portable Changeable Message Signs (Item 619.253) at least six (6) days in advance of the closure to advise motorists of the closure of the On & Off Ramps, and associated acceleration and deceleration lanes. Continue to use Portable Changeable Message Signs (Item 619.253) during the closure to redirect motorists to the alternate routes. Notify NHDOT Turnpikes Maintenance Engineer (Nasser Yari (603) 485-3806) and District 5, Maintenance Engineer (Pamela Mitchell (603) 666-3336), at least one (1) week in advance of the closure.
4. Loudon Road will be closed on the non-consecutive weekends beginning Friday, April 2, 2010 at 7:00 PM through Monday, May 24, 2010 at 7:00 AM during the reconstruction of the bridge decks (Friday evening at 7:00 PM to Monday morning at 7:00 AM). Temporary lane closures will also be allowed on Loudon Road at Exit 14 to clean the underside of the bridge, repair the bridge abutments, paint the steel girders, and to replace the bridge bearings. Maintain a minimum of 1 (one) through lane and one turn lane in each direction. Maintain a minimum of one sidewalk for pedestrian access. Temporary lane closures will be allowed as follows:
 - a. 9:00 PM to 6:00 AM Monday through Friday
 - b. 9:00 PM to 7:00 AM Saturday and Sunday (Non-Holidays)

SALVAGE OF MATERIALS

Salvage the following materials to the Department, if determined suitable for re-use, as required under 104.08:

Bureau of Bridge Maintenance (Doug Gosling, Administrator (603)-271-3667):

- Median barrier posts and offset blocks.

Bureau of Highway Maintenance District 5 (Pamela Mitchell, Maintenance Engineer (603) 666-3336)/ Bureau of Turnpikes (Nasser Yari, Maintenance Engineer (603) 485-3806):

- Drainage grates and frames
- Granite curb not used for re-set curb
- Any beam guardrail beam and hardware
- MELT terminal unit beam and hardware

Stockpile the salvaged materials at an approved location on the project and contact the appropriate Bureau for pick up one week in advance to schedule pickup.

Take ownership and make appropriate disposition of all other guardrail materials removed.

Removal of all materials will be paid for under specific Items of the contract or subsidiary as shown on the plans or as stated in the Proposal or in the Standard Specifications.

INTERMEDIATE COMPLETION DATES

Two Intermediate Completion Dates are included in the Contract to facilitate the replacement of the Southbound and Northbound bridge decks, respectively. The Intermediate Completion Dates correspond with two weekend closure periods (one for the southbound bridge deck and one for the northbound bridge deck) as shown on the plans and described in the specifications. The weekend closure periods must occur between April 2, 2010 and May 24, 2010 to avoid seasonally high traffic volumes and other traffic generating special events that occur outside of this date range. The Contractor shall notify the Department at least 4 weeks in advance of the anticipated weekend closures to allow sufficient time to prepare for public notification.

Incentives/Disincentives and No Excuse Bonus awards are provided in the Contract to encourage early completion of the work during each weekend closure period. See the Special Provision amending Subsection 108.08, *Incentive/Disincentive for Early Completion*, for additional details.

Intermediate Completion Date #1: This Intermediate Completion Date corresponds with the initial weekend closure period and the Phase 1 work as shown on the plans and described in the specifications. The Contractor shall select one of the weekend closure periods and corresponding Intermediate Completion Dates listed below. The Contractor shall notify the Department in writing of their selected weekend closure period and corresponding intermediate completion date at least **7 days** prior to the start of the weekend closure period.

- A. Weekend Closure Period Beginning Friday April 2, 2010
Intermediate Completion Date = Monday April 5, 2010 at 7:00 A.M.
- B. Weekend Closure Period Beginning Friday April 9, 2010
Intermediate Completion Date = Monday April 12, 2010 at 7:00 A.M.
- C. Weekend Closure Period Beginning Friday April 16, 2010
Intermediate Completion Date = Monday April 19, 2010 at 7:00 A.M.
- D. Weekend Closure Period Beginning Friday April 23, 2010
Intermediate Completion Date = Monday April 26, 2010 at 7:00 A.M.
- E. Weekend Closure Period Beginning Friday April 30, 2010
Intermediate Completion Date = Monday May 3, 2010 at 7:00 A.M.
- F. Weekend Closure Period Beginning Friday May 7, 2010
Intermediate Completion Date = Monday May 10, 2010 at 7:00 A.M.

Intermediate Completion Date #2: This Intermediate Completion Date corresponds with the final weekend closure period and the Phase 3 work as shown on the plans and described in the specifications. The Contractor shall select one of the weekend closure periods and corresponding Intermediate Completion Dates listed below. The Contractor shall notify the Department in writing of their selected weekend closure period and corresponding intermediate completion date at least **7 days** prior to the start of the weekend closure period.

- C. Weekend Closure Period Beginning Friday April 16, 2010
Intermediate Completion Date = Monday April 19, 2010 at 7:00 A.M.

//

- D. Weekend Closure Period Beginning Friday April 23, 2010
Intermediate Completion Date = Monday April 26, 2010 at 7:00 A.M.
- E. Weekend Closure Period Beginning Friday April 30, 2010
Intermediate Completion Date = Monday May 3, 2010 at 7:00 A.M.
- F. Weekend Closure Period Beginning Friday May 7, 2010
Intermediate Completion Date = Monday May 10, 2010 at 7:00 A.M.
- G. Weekend Closure Period Beginning Friday May 14, 2010
Intermediate Completion Date = Monday May 17, 2010 at 7:00 A.M.
- H. Weekend Closure Period Beginning Friday May 21, 2010
Intermediate Completion Date = Monday May 24, 2010 at 7:00 A.M.

The Contractor is made aware that consecutive weekend closure periods will not be permitted due to curing and loading restrictions of the cast-in-place concrete. The final weekend closure period cannot commence until the cast-in-place median barriers and brush curbs from Phase 2 construction have reached the required design strengths for legal traffic loads. The Contractor shall schedule and provide adequate time between the two selected weekend closure periods to allow for proper curing of these concrete components. No allowance will be made for weather days for the Intermediate Completion dates in accordance with the Special Provision to 108.07.

COMPLETION DATE

The Completion Date is October 15, 2010.

August 18, 2009

TRAFFIC CONTROL PLAN

The following are considered to be part of the Traffic Control Plan:

1. Sections 618 and 619 of the Standard Specifications.
2. Work Zone Traffic Control Standard Plans (TC series available on line under *Doing Business with DOT>Contractors* at www.nhdot.com or through the NHDOT Contracts Office, 603-271-3732).
3. *Manual on Uniform Traffic Control Devices* (MUTCD), 2003 edition with all current updates and official interpretations.
4. *Flagger and Uniformed Officer Use in Work Zones Policy and Guidelines* (available on-line under *Doing Business with DOT>Contractors* at www.nhdot.com or through the NHDOT Contracts Office, 603-271-3732).
5. *State of NH Flagger Handbook* (available through NHDOT – Bureau of Construction, 603-271-2571).

Additionally, the following are specific provisions for this project:

Provide all necessary traffic control devices and uniformed officers to ensure the safety of the workers, traveling public and property on this project. The above referenced specifications, guidelines, and provisions herein provide minimum requirements. Expand upon the Traffic Control Plan if conditions warrant or as directed.

SPEED REDUCTION

The existing legal posted speed limit(s) will be maintained within the overall limits of the construction signing; however, to promote safer working conditions, use trailer-mounted speed limit signs (Item 619.27) as authorized to reduce the posted speed limit in active work areas (where workers are present) from 55 mph to 45 mph, as posted. Reestablish the legal posted speed limit when work is discontinued, unless specifically approved. Notify NHDOT Turnpikes Maintenance Engineer (Nasser Yari (603) 485-3806) regarding signage south of I-93 Exit 14 and NHDOT District 5 Maintenance Engineer (Pamela Mitchell (603)-666-3336) for all other locations, in advance to coordinate this speed reduction.

13

MAINTENANCE OF TRAFFIC

1. Use the phased construction as shown on the Plans to maintain traffic on I-93 in each barrel, 12-foot minimum lane width pavement, during the bridge construction, except as otherwise prohibited elsewhere in this document.
2. Excluding the phased bridge construction as shown on the Plans, maintain traffic on full width pavement during non-work hours.
3. The NB and SB bridges at Exit 14 will (alternately) be closed on non-consecutive weekends beginning Friday, April 2, 2010 at 7:00 PM through Monday, May 24, 2010 at 7:00 AM for the construction of the deck replacement. The bridges will be closed beginning Friday evening at 7:00 PM to the following Monday morning at 7:00 AM. During this time period, Interstate traffic will be limited to the following lane use:
 - a. Friday 7:00 PM to Saturday 10:00 PM – 2 lanes NB and 1 lane SB
 - b. Saturday 10:00 PM to Sunday 6:00 AM – 1 lane NB and 1 lane SB (An additional lane is needed to shift the barrier to accommodate the next traffic pattern).
 - c. Sunday 6:00 AM to Sunday 10:00 PM – 1 lane NB and 2 lanes SB
 - d. Sunday 10:00 PM to Monday 7:00 AM – 1 lane NB and 1 lane SB (An additional lane is needed to move the barrier to reopen I-93 to 4 lanes).
4. The Exit 14 SB off ramp will be closed during the entire weekend closure for the construction of the I-93 SB deck replacement. The Exit 15 SB off and on ramps (to and from I-393 EB) will be closed from 7:00 PM Friday night to 6:00 AM Sunday morning during both weekend closures while the SB barrel is reduced to a single lane. These (Exit 15) ramps will be opened beginning at 6:00 AM Sunday morning, once I-93 SB has been restored to two lanes. The I-393 WB ramp to I-93 SB shall remain open to traffic at all times.
5. Lane closures and ramp closures will only be allowed during the bridge construction time periods and nights for other construction due to traffic volumes.
6. A northbound lane of I-93 may be closed Sunday through Thursday, 8:00 pm to 6:00 am. A southbound lane of I-93 may be closed Monday through Friday, 8:00 pm to 6:00 am.
7. The Exit 14 NB off ramp and SB on ramp will be closed at night to complete the paving operations. One ramp may be closed at a time. Closures will be allowed as follows:
 - a. NB off ramp
 - i. 8:00 PM to 6:00 AM Monday through Friday
 - ii. 8:00 PM to 7:00 AM Saturday and Sunday (Non-Holidays)
 - b. SB on ramp

- i. 8:00 PM to 7:00 AM Monday through Friday
 - ii. 7:00 PM to 7:00 AM Saturday and Sunday (Non-Holidays)
- c. The Contractor shall provide adequate detour signage (subsidiary to Item 619.1 – Maintenance of Traffic) to direct motorists to Exit 15 during the closure of the NB off ramp, and to Exit 13 during the closure of the SB on ramp. Use Portable Changeable Message Signs (Item 619.253) at least six (6) days in advance of the closure to advise motorists of the closure of the On & Off Ramps, and associated acceleration and deceleration lanes. Continue to use Portable Changeable Message Signs (Item 619.253) during the closure to redirect motorists to the alternate routes. Notify NHDOT Turnpikes Maintenance Engineer (Nasser Yari (603) 485-3806) and District 5 Maintenance Engineer (Pamela Mitchell (603) 666-3336), at least one (1) week in advance of the closure.
8. In all cases, once a ramp is closed at the beginning of a night then it may be kept closed for the entire period that lane closures are allowed. Perform the work on the ramp concurrent with the closure.
9. Loudon Road will be closed on the non-consecutive weekends beginning Friday, April 2, 2010 at 7:00 PM through Monday, May 24, 2010 at 7:00 AM during the reconstruction of the bridge decks (Friday evening at 7:00 PM to Monday morning at 7:00 AM). Temporary lane closures will also be allowed on Loudon Road at Exit 14 to clean the underside of the bridge, repair the bridge abutments, paint the steel girders, and to replace the bridge bearings. Maintain a minimum of 1 (one) through lane and one turn lane in each direction. Maintain a minimum of one sidewalk for pedestrian access. The Contractor shall provide a temporary shuttle service (paid under Item 670.5 – Temporary Shuttle Service) for transporting pedestrians and bicyclists during the closure periods of Loudon Road under I-93. Temporary lane closures will be allowed as follows:
- a. 9:00 PM to 6:00 AM Monday through Friday
 - b. 9:00 PM to 7:00 AM Saturday and Sunday (Non-Holidays)
10. The Contractor shall provide adequate detour signage (paid under Item 619.1 – Maintenance of Traffic), as shown on the plans, to direct motorists to alternate routes during the closure of Loudon Road and the ramps. Use Portable Changeable Message Signs (Item 619.253) at least six (6) days in advance of the closure. Continue to use Portable Changeable Message Signs (Item 619.253) during the closure to redirect motorists to the alternate routes. Notify NHDOT Turnpikes Maintenance Engineer (Nasser Yari (603) 485-3806), NHDOT District 5 Maintenance Engineer (Pamela Mitchell (603) 666-3336) and the City of Concord Fire Department at least one (1) week in advance of the closures.
11. Heavy traffic volumes are expected for NASCAR race weekends (June 26, 2010 and September 19, 2010) at New Hampshire Motor Speedway (NHMS) (**verify these dates with the NHMS**), and for “Motorcycle Week”, including the Laconia Classic Motorcycle Races, (from June 12, 2010 through June 20, 2010.) Special traffic control measures, that are very comprehensive and complex, in order to efficiently and safely maintain traffic

flow are employed by the NHDOT, State and local law enforcement agencies, local communities, and other significant stakeholders during these events. In order to assure that these traffic control measures are able to be implemented without conflict with the project, take the following actions:

- a. Attend the Traffic Control Meetings for the events cited above, held during the life of the projects, at the times and place directed. Provide schedules of work activities, anticipated state of the project, provisions to meet requirements for the events' Traffic Control, and other any other related information.
- b. Be aware that the District 5, Bureau of Highway Maintenance and the Bureau of Traffic begins traffic control measures one week in advance of the NASCAR races. In order to facilitate these measures, special paint pavement markings exist on I-93, I-393, and NH Route 106 to indicate placement of traffic control devices, changeable message signs, alternate lane configurations, tapers, etc. These measures include, but are not limited to,
 - i. Placing "rapid mount" signs along I-93, I-393 and Route 106. The bases for the quick mount signs are both within the medians and along the side of the routes.
 - ii. Placing portable changeable message signs along the routes on graded pads in specific locations.
 - iii. Placing assorted traffic control signs and devices along the routes to facilitate placement during the events.
 - iv. Removal and subsequent re-installment of portable concrete barrier south of the I-93 bridges over the Merrimack River.
- c. A plan showing all the locations of the special pavement markings, "rapid mount" sign bases, changeable sign platforms, and the location of any other pertinent traffic control sites will be provided to the Contractor prior to beginning construction. When the Contractor disturbs any of these noted features, restore these within a minimum of two weeks of the beginning of the event. Hold a review with the Engineer and the District 5 Highway Maintenance Engineer a minimum of three weeks prior to the beginning of the event. Pave to at least the top of the binder course and restore special pavement markings on these surfaces. Perform this work under Item 619.1 Maintenance of Traffic.
- d. During the noted periods of these events:
 - i. Maintain traffic on the existing alignment on full width pavement, not on cold planed surfaces, with appropriate pavement markings during these times. Suspend all work and/or traffic control operations that interfere with traffic during these time frames as directed.
 - ii. Within the limits of the pavement, have all drainage basin grates and frames no lower than 1.5" below the pavement surface or no higher than

flush with the pavement (depending on the stage of the pavement rehabilitation) and have all manhole covers, pullboxes, etc., flush with the pavement.

- iii. Cover, uncover, or remove construction signs and warning devices as necessary (subsidiary to Item 619.1) to provide clear and non-conflicting traffic control through the effected area(s).
 - e. Do not use median crossovers (if still in place).
12. Prior to commencing any construction activity or at the change of major construction phases, notify the City Fire Department and provide information regarding traffic control operations where the flow of traffic through the work zone may be temporarily interrupted.
13. The contract plans include an Emergency Detour Plan that could be implemented, at the direction of the Contract Administrator, in the event that traffic along I-93 begins to have excessive queuing due to lane reductions during the weekend closure periods. Should the detour plan be implemented, the Contractor shall provide the appropriate detour signage paid under Item 619.1 – Maintenance of Traffic.

PROHIBITION OF UNNECESSARY TRAFFIC OBSTRUCTION

The clear zone, measured out from the edge of the traveled way open to traffic, shall be 30 feet where the posted speed limit is 50 mph or greater and shall be 15 feet where the posted speed is 45 mph or less.

VARIATION FROM THE TRAFFIC CONTROL PLAN

If the Contractor feels improvements can be made to the Traffic Control Plan for this project, submit a written proposal with any necessary plans for consideration and approval.

11/24/08

Supersedes Spec. Attn. dated 10/1/92, 11/29/93, 9/11/97; 04/30/98. 07/08/05, 09/11/07

SPECIAL ATTENTION

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORM WATER CONSTRUCTION GENERAL PERMIT REQUIREMENTS

Contractors are advised that 40 CFR Part 122 applies to this project. This provision prohibits point source discharges of storm water associated with construction activity to water bodies of the United States without a National Pollutant Discharge Elimination System (NPDES) storm water construction general permit.

This project is eligible for coverage under the reissued NPDES Storm Water Construction General Permit for Storm Water Discharge from construction sites which was published in the Federal Register Vol. 73, No. 135 on Monday July 14, 2008. Contractors shall prepare and submit a copy of the Environmental Protection Agency (EPA), Notice of Intent (NOI) Form 3510-9 at least 7 days prior to commencement of construction on any site which will result in the disturbance of the land.

Other provisions of the General Permit requires a Storm Water Pollution Prevention Plan to be prepared, implemented, kept current, and maintained on the project site along with inspection reports; and when the project site has been finally stabilized and storm water discharges from construction activities have been eliminated, a Notice of Termination (NOT) Form 3510-7 must be prepared and submitted to the Environmental Protection Agency.

NPDES General Guidelines, including an outline for Construction (Storm Water) Pollution Prevention Plan, Notice of Intent and Notice of Termination are available on the internet in the Business Center at www.nhdot.com or through the NHDOT Contracts Office.

An "active status" of the all submitted NOI's is required prior to commencing any work on the project.

On both the Notice of Intent (NOI) and the Notice of Termination (NOT) forms the information relative to the Facility Operator Information shall be that of the prime Contractor.

It is suggested to file NOI and NOT via the EPA website:

<http://cfpub.epa.gov/npdes/stormwater/enoi.cfm>.

18

PROJECT: CONCORD
STATE NO.: 13742C

The following information is provided to help in the Contractor's preparation of the Environmental Protection Agency NPDES Permit NOI form. It is expressly understood and agreed that the information has been obtained with reasonable care and recorded in good faith, but the Department assumes no responsibility whatsoever with respect to the sufficiency or accuracy of the information.

Latitude: 43° 12' 32" **Longitude:** 71° 31' 59"
 From : USGS Topo (scale _____); GPS or Other GOOGLE EARTH

SIC or Designated Activity Code: Roadway Code 1611 Bridge Code 1622 _____

Name of Receiving Water(s) (within 1 mile): Merrimack River

Estimated Area to be Disturbed (Round to 0.25 Hectares (Acres): 1.17 AC.

(Subject to revision by contractor with approval of Construction Bureau depending on Contractor operations)

Estimated Area of Site (Hectares (Acres)): 7.60 AC.

Estimated Runoff Coefficient of Site after Construction: 0.9.

Types of Soil (SCS Soil Classifications): websoilsurvey.nrcs.usda.gov/app/ 1A - Occum very fine sandy loam, 0-3% slopes, frequently flooded, 2A - Suncook loamy fine sand, 0-3% slopes, occasionally flooded, 5A - Rippowam very fine sandy loam, 0-3% slopes, frequently flooded, 6A Saco mucky silt loam, 0-2% slopes, frequently flooded, 498A - Urban land-Pootatuck complex, 0-3% slopes, 598B - Windsor - Urban land complex, 0-8% slopes, 699B - Urban land, 0-8% slopes

Endangered or Threatened Species in Project Area: No

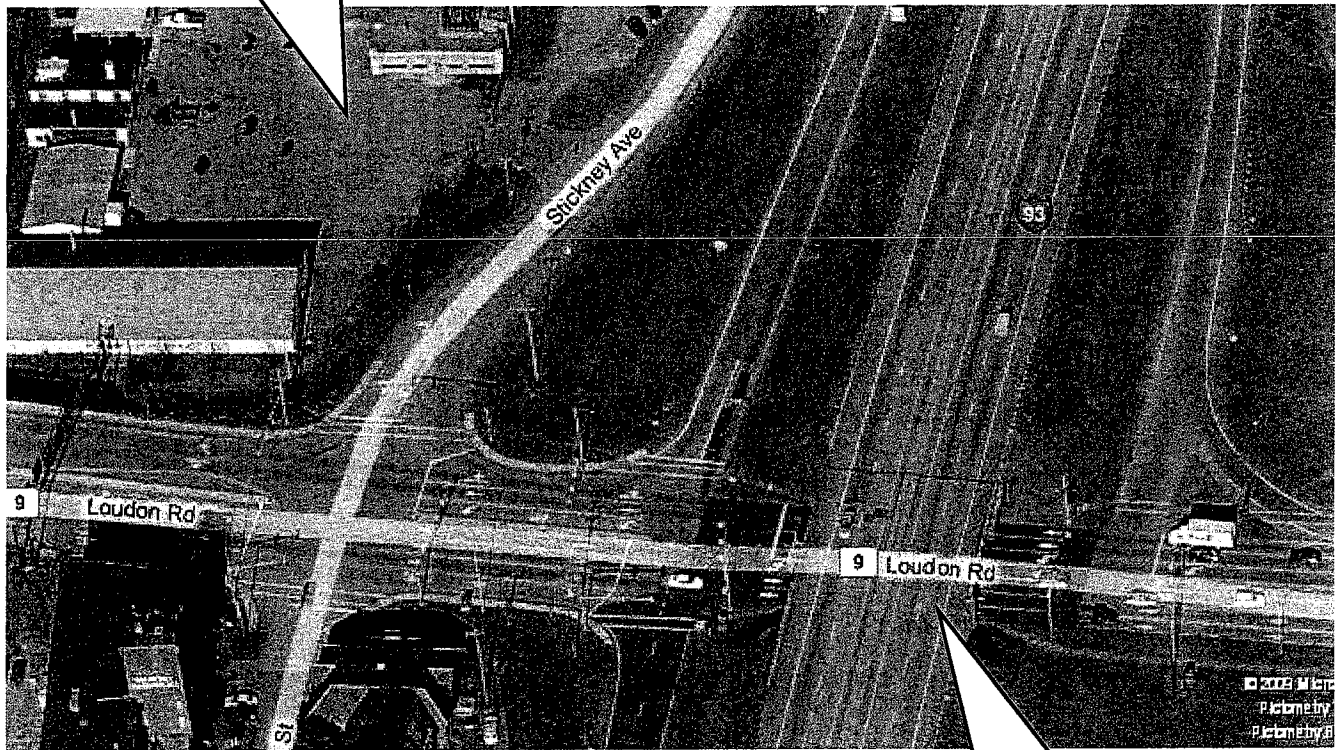
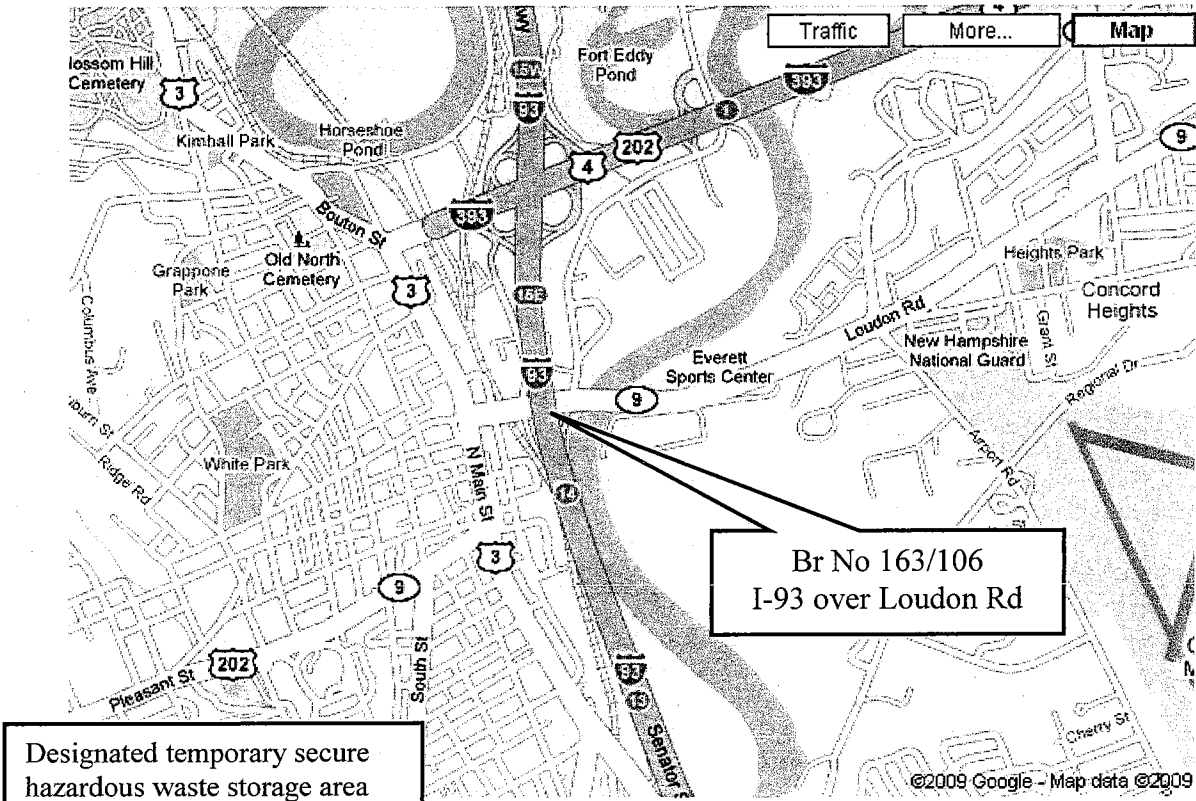
Criteria (A thru F): A

Designated Critical Habitat in Project Area: No

Discharge consistent with requirements of EPA approved or established TMDL(s): Yes / No

19

Concord 13742C - Bridge Painting



Location Map

Br No 163/106
I-93 over Loudon Rd



RCRA C SITE IDENTIFICATION FORM;
Notification of Hazardous Waste Activity
 NH DES Waste Management Division-RIMS
 PO Box 95, Concord NH 03302
 (603) 271-2921

Shaded box for NH DES Office Use Only

EPA ID No. NHD ("Inactive" until notified from the jobsite) HzWIMS

1. Reason for Submittal and Effective Date
 Enter effective date here (see comments in paragraph 12) then check the correct box.
 To provide **initial notification** (to obtain an EPA ID Number for hazardous waste, including universal waste or used oil activities). *To ensure that your notification is processed promptly, please include the \$100 fee (if applicable).*
 To provide **subsequent notification** and/or update biennial reporting data (to update site identification information). Reason:

2. Site Name
Company Name: NH Department of Transportation - Division of Project Development

3. Site Location Information
Street Address: NHDOT Project ID: **CONCORD 13742C**
 Br No 163/106 I-93, FEET over NH 9, Loudon Road (see map)
City or Town: Concord **State:** NH
County Name: Merrimack **Zip Code:** 03301

4. Site Land Type
 Private Federal Municipal State Other

5. NAICS Code(s) (at www.naics.com)
A. 562910, Lead Paint Removal Contractors **B.**
C. **D.**

6. Site Contact Person
First Name / Last Name / Title:
 Dean Wilson District Construction Engineer, NHDOT Bureau of Construction
 or (Jerry Zoller) (Project Engineer) (NHDOT Bureau of Bridge Design)
Phone number / Email address:
 Dean Wilson 271-2571 DWilson@dot.state.nh.us
 or (Jerry Zoller) (271-2731) (JZoller@dot.state.nh.us)

7. Site Mailing Address
Street or P. O. Box: NH DOT Bureau of Construction
 PO Box 483, 7 Hazen Drive
City or Town: Concord
State: NH **Zip Code:** 03301

8a. Legal Owner of the Site
 (List additional owners in the comments section.)
Name of Site's Legal Owner: State of NH - Dept of Transportation (NHDOT) **Date Became Owner (mm/dd/yyyy):** N.A.
Street or P. O. Box: PO Box 483, 7 Hazen Drive **Phone Number:** 603-271-3731 (Commissioner)
City or Town: Concord **State:** NH **Zip Code:** 0331
Owner Type: Private Federal Municipal State Other

8b. Legal Operator of the Site
 (List additional operators in the comments section.)
Name of Site's Legal Operator: Contractor (will notify DES at startup of project) **Date Became Operator (mm/dd/yyyy):**
Street or P. O. Box: **Phone Number:**
City or Town: **State:** **City or Town:**
Owner Type: Private Federal Municipal State Other

This form should have instructions with it; if not, please visit www.des.nh.gov/rims/ or call (603)271-2921.

21

9. Type of Regulated Waste Activity (Mark 'X' in the appropriate boxes.)

A. Hazardous Waste Activities:

1. Generator of Hazardous Waste

(Choose only one of the following four categories. Do not calculate Used Oil For Recycle toward your generator size.)

NH Full Quantity Generator (FQG); Federal LQG

Generate equal to or greater than 1,000 kg/mo (2,200 lbs.) of *non-acute* hazardous waste; or generate in a calendar month or accumulate at any time 1 kg (2.2 lbs.) or more of *acute* hazardous waste

NH Full Quantity Generator (FQG); Federal SQG

Generate equal to or greater than 100 and less than 1,000 kg/mo (220 - 2,200 lbs.) of *non-acute* hazardous waste

NH Small Quantity Generator (SQG); Federal CESQG

Generate less than 100 kg/mo (220 lbs.) of *non-acute* hazardous waste; or generate in a calendar month or accumulate at any time less than 1 kg (2.2 lbs.) of *acute* hazardous waste

Not a Generator

This site does not presently generate hazardous waste.

In addition, indicate other generator activities that will affect how you are regulated. (Please check all that apply.)

- Precious Metal Recovery accumulated on-site (e.g., Silver)
 Emergency Temporary Generator (valid for 30 days)
 Household Hazardous Waste Collector
 Importer of HW from a foreign country
 Mixed Waste (hazardous and radioactive) Generator

For Items 2 through 5, check all that apply. Please note that a hazardous waste permit or transporter registration may be required for activities in items 2 through 4.

2. Transport Hazardous Waste
 3. Treat, Store, or Dispose Hazardous Waste (at your site)
 4. Recycle Hazardous Waste (at your site)
 5. Consolidate NH Small Quantity Generator Waste
 This site will accumulate waste from a NHSQG site owned by the same owner. (Please be sure that the box checked off in item 9A1 reflects the additional quantities of waste that will be received.)

B. Universal Waste Activities

1. Total quantity of Universal Waste on site at any time:

- a. Greater than 20,000 kg (44,000 lbs.); VLQH
 b. Greater than 5,000 kg but less than 20,000 kg (11,000 lbs to 44,000 lbs.); LQH

2. If you checked an item above, please indicate the types of universal waste generated and/or accumulated at your site. (Check all boxes that apply.)

	Generate	Accumulate
a. Batteries	<input type="checkbox"/>	<input type="checkbox"/>
b. Pesticides	<input type="checkbox"/>	<input type="checkbox"/>
c. Thermostats	<input type="checkbox"/>	<input type="checkbox"/>
d. Lamps	<input type="checkbox"/>	<input type="checkbox"/>
e. Antifreeze	<input type="checkbox"/>	<input type="checkbox"/>
f. Mercury Containing Devices (excluding Thermostats)	<input type="checkbox"/>	<input type="checkbox"/>
g. Cathode Ray Tubes	<input type="checkbox"/>	<input type="checkbox"/>

 3. Destination Facility for Universal Waste (any amount)

(Note: A hazardous waste permit may be required for this activity.)

4. Lamp handler intentionally crushing or dismantling lamps (Note: A hazardous waste permit is required for this activity.)

C. Used Oil Activities

1. Used Oil Transporter - Indicate Type(s) of Activity(ies)

- a. Transporter
 b. Transfer Facility

2. Used Oil Processor and/or Re-refiner - Indicate Type(s) of Activity(ies)

- a. Processor
 b. Re-refiner

3. Used Oil Burner

- a. Off-specification
 b. Specification

4. Used Oil Fuel Marketer Who Directs Shipment of Used Oil to a Used Oil Burner

- a. Off-specification
 b. Specification

 5. Used Oil Fuel Marketer Who First Claims the Used Oil Meets the Specifications 6. Commercial Used Oil Collection Center

Our hazardous waste hotline can help you determine your regulated activities. Call toll free (866)HAZWAST.

10. Description of Hazardous Wastes. Please list the waste name (excluding universal wastes and used oil for recycling), source code, waste numbers and estimated monthly volume of the hazardous waste handled at your site. Use all waste codes for each waste stream. Source codes can be found in Appendix A of your instructions. Please use an additional page if more spaces are needed.

Waste Name	Source Code	EPA/State Hazardous Waste Numbers	Estimated Monthly Volume (include unit of measure)
RQ, Hazardous Waste Solid, n.o.s. 9, NA 3077 PG III (Contains Lead Compounds DOO8 Dry lead paint chips	G19	D008	3,000 lbs/mo. for 4 weeks
Flammable Solvents (paint thinners)	G19	D001	moderate quantity

11. Certification Programs: All hazardous waste generators are required to be in a certification program. Please complete the appropriate certification program documentation A or B below.

A. FQG Certification; Hazardous Waste Coordinator Certification: Please list the certificate number and name of your primary Certified Hazardous Waste Coordinator (HWC).

Certificate Number: - _____ First Name: _____ Last Name: _____

B. SQG Self-Certification: Please list the date of your last SQG self certification ____/____/____ if applicable*.
* See instruction page 4 for SQG implementation schedule. Month Day Year

12. Comments:

A location map is attached depicting the location of the bridge(s) and any designated waste storage areas to be used by DES in the determining the boundaries of the site.

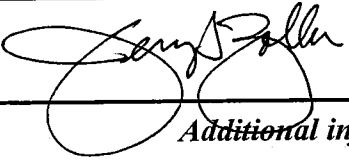
This notification of hazardous waste activity pertains to a NHDOT construction project involving the repainting of existing state bridge(s) which contains lead paint. This notification is specific for this bridge(s). The bridge(s) is/are identified by the DOT by a Town name, a project number, and bridge number.

The NHDOT requests an EPA ID number for the bridge(s) prior to advertising the construction project. The project is "inactive" by DES until notified from the jobsite. The date of the actual generation of waste is dependent on the Contractor's schedule. The contract specifications require the Contractor to call the NH DES WMD RIMS one week before the startup of waste generation activities.

At the conclusion of the activity and after the waste has been transported off the job to the TSD facility, the Contractor will submit a NH DES WMD declassification form to DES to signify the end of the project.

13. Form Certification.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

<u>Signature of owner, operator, or authorized representative</u>	<u>Printed name of owner, operator, or authorized representative</u>	<u>Official Title</u>	<u>Date Signed (mm-dd-yyyy)</u>
	Jerry S. Zoller, P.E., Bridge Design	Project Engineer	8/11/09

Additional information, forms and instructions can be found at www.des.nh.gov/rims/.

State of New Hampshire
Department of Transportation

BRIDGE PAINTING REPORT FORM

send to: Department of Environmental Services, Air Resources Division
PO Box 95, 6 Hazen Dr. Concord, NH 03302-0095 Tel. (603) 271-6791, Fax -7053

PROJECT NAME	CONCORD		
Project number	13742C		
Project location	I-93, FEET over NH 9, Loudon Road		
Br. No.	163/106		
Bridge length	82 feet		
Area to be painted (ft ²)	10,400 sf		
PAINTING CONTRACTOR			
Contact person			
Company tel. / fax			
Field contact			
Is LEAD PAINT to be removed?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
SCHEDULE - start date (±)			
completion date (±)			
NEW PAINT	company:		
Primer	name:	quant'y	gal.
Intermediate	name:	quant'y	gal.
Finish coat	name:	quant'y	gal.
DOT Field contact			
DOT Office contact	Construction Bureau, 271-2571		Bridge Design 271-2731

This form is to be sent / faxed to DES ARD on NHDOT bridge painting projects prior to startup.

24



NH HAZARDOUS WASTE DECLASSIFICATION FORM

NH DES Waste Management Division-RIMS
PO Box 3900, Concord NH 03302-3900
(603) 271-2921

Shaded boxes for NH DES
office use only

EPA ID No. NHD

MTS

RCRA Info

Please save this form and submit it to the Department if you discontinue hazardous waste activities.

1a. Company Name: NH Dep't of Transportation - Division of Project Development

1b. Effective Date:

Physical location of the company to be declassified.

2. Site Location Information	Street Address: NHDOT Project ID: CONCORD 13742C Br No 163/106 I-93, FEET over NH 9, Loudon Road (see map)		
	City or Town: Concord	State: NH	
	County Name: Merrimack	Zip Code: 03301	

Person to contact with questions regarding this declassified site.

3. Site Contact Person	First Name / Last Name / Title: Dean Wilson District Construction Engineer, NHDOT Bureau of Construction or (Jerry Zoller) (Project Engineer) (NHDOT Bureau of Bridge Design)		
	Phone number / Email address: Dean Wilson 271-2571 DWilson@dot.state.nh.us or (Jerry Zoller) (271-2731) (JZoller@dot.state.nh.us)		

Mailing address where future correspondence regarding this declassified site can be sent.

4. Site Mailing Address	Street or P. O. Box: NH DOT Bureau of Construction PO Box 483, 7 Hazen Drive		
	City or Town: Concord		
	State: NH	Zip Code: 03301	

5. Have all hazardous waste been removed from this site? Yes No
If no, what wastes remain and what provisions have been made for removal?

6. Has the property been sold or leased to another company which will generate hazardous waste? NA

7. Reason for Declassification: Relocation. Company Closing. Ceasing all hazardous waste activities.
New Address _____
City _____ State _____ Zip _____

8. If the company has moved:
Will hazardous waste be generated at the new site? Yes No Not Applicable
If yes, has a notification packet been submitted? Yes No

9. Additional Comments: (use this space for additional information regarding this request; attach more sheets if necessary):

The generation of hazardous waste for this EPA ID number occurred during a NHDOT construction project involving the repainting of specific existing state bridges with old coatings containing lead. This short-duration project has been completed, and the waste properly collected and removed. No additional hazardous waste generation is planned or anticipated as part of this NHDOT construction project.

10. Certification: The information submitted herein is, to the best of my knowledge and belief, true, accurate and complete.

Signature:	Printed Name:	Title:	Date:
-------------------	----------------------	---------------	--------------

Obtain a copy of this form at www.des.nh.gov/rims/ or by calling (603) 271-2921.

25

Sample manifest: Include this info...

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
5. Generator's Name and Mailing Address			Generator's Site Address (if different than mailing address)		
Generator's Phone:				U.S. EPA ID Num	
6. Transporter 1 C				U.S. EPA ID Numbe	
7. Transporter 2 C					
State of NH DOT, Attn. Bur. of Construction 7 Hazen Dr, PO Box 483, Concord, NH 03302 603-271-2571			DOT Contract: CONCORD 13742C Bridge No 163/106 I-93, FEET over NH 9, Loudon Rd		
GENERATOR	9a. HM	9b. U.S. DOT Description (including proper shipping name, hazard class, ID number, and Packing Group (if any))		10. Containers	11. Total Quantity
				No.	Type
	1.				
	2.				
	3.	RQ, Hazardous waste, solid, n.o.s. (Lead), 9, NA3077, PG III, (D008)			
4.					
13. Waste Codes					
14. Special Handling Instructions and Additional Information					
15. GENERATOR'S/OFFEROR'S CERTIFICATION: I declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects ready for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment are in accordance with the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in Item 15 is true. (I am a large quantity generator) or (b) (if I am a small quantity generator) is true.					
Generator's/Offoror's Printed/Typed Name			Signature		Month Day Year
TRANSPORTER INT'L	16. International Shipments <input type="checkbox"/> Int'l				
	17. Transporter Acknowledgment of Receipt of Hazardous Waste				
	17. Transporter Acknowledgment of Receipt of Hazardous Waste				
Transporter 1 Printed/Typed Name			Signature		Month Day Year
Transporter 2 Printed/Typed Name			Signature		Month Day Year
DESIGNATED FACILITY	18. Discrepancy				
	18a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection				
	18b. Alternate Facility (or Generator) Manifest Reference Number: U.S. EPA ID Number				
	Facility's Phone:				
	18c. Signature of Alternate Facility (or Generator)			Month Day Year	
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)					
1.		2.		3.	
20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a					
Printed/Typed Name			Signature		Month Day Year

26

SA

CONCORD
13742C

August 20, 2009

SPECIAL ATTENTION

SECTION 102 -- BIDDING REQUIREMENTS AND CONDITIONS

MANDATORY PRE-BID MEETING

The Bidder is required to attend a mandatory pre-bid meeting as a condition for submitting a bid. The Bidder's representative must be a paid employee of the company. The meeting will be held on Thursday, September 10, 2009, in Room 112/113 at the New Hampshire Department of Transportation headquarters, John O. Morton Building, 7 Hazen Drive, PO Box 483, Concord, NH 03302, beginning promptly at 9 am. Directions to the John O. Morton Building are available on line at <http://www.nh.gov/dot/faq.htm#Directions>

Questions may be submitted in writing to the Department during the meeting or sent to Don Lyford (DLyford@DOT.State.NH.US, fax: 603-271-3725) at least five (5) days before the hour and date set for the Bid Opening. A written response will be distributed by email and fax to all Bidders in a timely manner.

27-y

SA

CONCORD
13742C

August 19, 2009

SPECIAL ATTENTION

Section 108.01 – Subletting of Contract

Prime Contractor's Work Percentage

On this project, the Prime Contractor's organization shall perform work amounting to no less than **40%** of the total contract bid amount. This percentage has been lowered from 50% (Section 108.01).

28

01/12/09

SSD: 03/31/08

SPECIAL ATTENTION

This special attention pertains to Item 502, Removal of Existing Bridge Structure, and related construction activities.

The Contractor is advised that the existing paint system(s) on the existing bridge is lead-bearing paint (LBP) and contains hazardous concentrations of lead.

The Contractor shall perform construction and demolition activities (e.g. flame cutting, rivet busting, removal of bridge members, etc.) involving bridge components with LBP in conformance with the applicable worker protection provisions of OSHA 1926.62, Lead Exposure in Construction Final Rule; and LBP debris shall not be permitted to enter the environment in conformance with the environmental protection requirements of the NH Department of Environmental Services.

The Contractor's plan for the removal of the existing bridge shall include worker protection and environmental protection measures. The Contractor shall not commence with bridge removal work without submittal and approval of the compliance plan.

Reference to these regulations shall not preclude or preempt any local, State or Federal regulations that may also apply.

The Contractor will not be held responsible for the abatement of any pre-existing conditions at the bridge site involving LBP.

07/29/08

Supersedes Spec. Att. dated 11/1/98; 8/25/1999

SPECIAL ATTENTION**REQUIRED PAINTING CONTRACTOR CERTIFICATION TO SSPC QP1 and QP2 FOR
BRIDGE PAINTING****Effective November 1, 1998**

All painting contractors and painting subcontractors to be used for painting structural steel bridges shall establish proof of competency and responsibility by being registered and certified in accordance with the requirements of the Painting Contractor Certification Program (PCCP) of the Steel Structures Painting Council (SSPC) of Pittsburgh, PA (contact Michael Damiano at tel. 412-281-2331).

Certification for QP1 is required for all painting projects. Certification for QP2 is also required for projects involving the removal or overcoating of lead-based paint.

This program is based upon SSPC QP1, "Standard Procedure for Evaluating Qualifications of Painting Contractors (Field Application to Complex Structures)", August 1, 1998 and SSPC QP2, "Standard Procedure for Evaluating Qualifications of Painting Contractors to Remove Hazardous Paint", August 1, 1995.

The painting contractor and painting subcontractor shall be certified by SSPC PCCP before the day of bid opening and shall maintain certification and certified representation on site throughout the duration of the project until final acceptance of the work.

10/31/08

Supersedes Spec. Attn. dated 6/7/94, 8/14/97 & 3/17/98

SPECIAL ATTENTION

Four weeks prior to the start of casting of any precast and/or prestressed items specified below, the Contractor shall notify the Bureau of Materials and Research, Concrete Unit Supervisor (603-271-3151), of intent to start casting and advise them of the name and location of the manufacturer. This will allow the Department time to make arrangements for inspection. Items not documented as being inspected will not be accepted.

The following precast and/or prestressed items will have continuous inspection during casting: all bridge components; permanent concrete barrier; special catch basins, drop inlets and manholes over six feet in diameter; and concrete pipes greater than 72 inches in diameter.

04/15/09

SSD: 12/3/79, 4/10/80, 11/19/82, 5/9/83, 12/7/90, 12/20/96, 07/14/04, 09/01/05, 08/06/07 & 01/07/09

August 17, 2009

SPECIAL ATTENTION**FUEL ADJUSTMENT**

(a) The shortage of all products in relation to the national and worldwide energy situation has made future costs of fuel unpredictable. For this reason, a price adjustment clause is being inserted in this contract to provide for either additional compensation to the Contractor or payment to the State, depending upon an increase or decrease in the price of fuel.

(b) The fuel usage factors, which will be applied to the several items of the Contract shall be those set forth in Table 1.

(c) Price adjustment will be based upon the quantity of fuel incorporated in the work as determined by the factors in Table 1.

When the monthly sales price determined per paragraph (f) is more than 110% of the fixed base price set forth in paragraph (e), a contract adjustment will be made under Item 1010.15 based on: [monthly sales price less 110% of the fixed base price] multiplied by [item quantity eligible for payment during month] multiplied by [fuel factor].

When the monthly sales price determined per paragraph (f) is less than 90% of the fixed base price set forth in paragraph (e), a contract adjustment will be made under Item 1010.15 based on: [monthly sales price less 90% of the fixed base price] multiplied by [item quantity eligible for payment during month] multiplied by [fuel factor].

(d) The Contractor warrants that its bid prices for this Contract include no allowances for any contingency to cover increased costs for which adjustment is provided herein.

(e) The fixed base price of fuel will be:

\$ 2.4692 per gallon on English Projects.

\$ 0.6524 per liter on Metric Projects.

This price is used solely to compute price adjustments. The fuel price will be the lower bulk retail price of low sulfur diesel fuel for Boston as published by the Journal of Commerce and will include current Federal and State taxes.

(f) The monthly sales price of fuel will be determined by the Department on the 15th calendar day of each month. When the 15th calendar day falls on a Sunday, the price on the first

business day following the 15th calendar day will be utilized. Monthly sales prices will be set in the same manner as indicated in paragraph (e).

(g) The price adjustment, when such adjustment is called for as provided in paragraph (c), will be made subsequent to the month in which the work was accomplished.

(h) No price adjustment will be allowed beyond the Project completion date unless there is a Department-approved extension of time. Price adjustments will not be made on quantities adjusted as a result of the final audit.

(i) The Department will not be responsible for computing or otherwise indicating price adjustments except to the prime contractor, which must make its own arrangements with its subcontractors.

(j) When no item for Fuel Adjustment is included in the Contract no adjustments will be made.

Pay item and unit:

1010.15 Fuel Adjustment ¹ \$

¹ Not a bid item.

Table 1 - FUEL FACTORS

Item of Work	Item No.	Units	Fuel
Excavation:			
Earth	203.1_,4_	gal/c.y.	0.26
	203.50_,51_,52_	(liters/m ³)	(1.29)
	203.6_,7_		
	206.1_		
	207.1_		
	504.1_		
Rock	203.2_	gal/c.y.	0.34
	206.2_	(liters/m ³)	(1.68)
	207.2_		
	504.2_		
Other	203.3_	gal/c.y.	0.31
	206.3_	(liters/m ³)	(1.54)
	207.3_		
	583._		
	585._		
	586._		
	587._		
Bases:			
Unprocessed	209._	gal/c.y.	0.46
	304.1_,2_	(liters/m ³)	(2.28)
Processed	304.3_	gal/c.y.	0.82
	304.4_,5_,6_	(liters/m ³)	(4.06)
	508._		
Bituminous Concrete			
Pavement ²	403._	gal/ton	1.90
	411._	(liters/t)	(7.93)
All Other Items:		gal/\$1,000 of work (liters/\$1,000 of work)	13.0 (49.2)
Excluding:³			
		563.1_	618._
210._	510.65_	563.2_	619._
211._	528._	563.3_	624._
306.31_	544._	563.7_	645.7_
306.32_	548._	565.1_	692._
410._	550.1_	565.2_	698._
510.31_	550.2_	565.7_	8__._
510.41_	560._	568._	10__._
510.61_	561._	592._	

² Item 403.4 & 403.6 shall be calculated using the "All Other Items" category rate.

³ Also excluded are all supplementary agreements, extra work and per specification items.

4/15/09

SSD: 7/30/75, 5/9/83, 12/5/84, 2/12/92, 10/19/93, 5/9/94,
1/26/95, 12/30/96, 02/24/97 and 12/08/08

August 14, 2009

SPECIAL ATTENTION

ASPHALT CEMENT ADJUSTMENT

All bid items involving asphalt concrete mixtures (except items 403.4 & 403.6) listed in Sections: 403, Hot Bituminous Pavement and 411, Plant Mix Surface Treatment; containing asphalt cement will be subject to a price adjustment. This adjustment will take effect when the monthly price for asphalt cement as furnished by the Bureau of Materials and Research differs from the base price contained in the proposal.

The price adjustment will be based on the percent of virgin asphalt cement stated in the Approved Mix Design containing the maximum percentage of reclaimed asphalt pavement. In the event of breakdown or unforeseen circumstances other than weather, an Approved Virgin Mix Design may be used. The price adjustment will then be based on the total percent of virgin asphalt cement in that approved design.

The base price of asphalt cement for this Contract is:

\$ 485.00 per ton on English Projects.

\$ 534.47 per metric ton on Metric Projects.

The monthly price of asphalt cement will be furnished by the Bureau of Materials and Research on the first business day following the 14th calendar day of each month.

The contract prices of Hot Bituminous Pavement, Recycled Bituminous Pavement and Plant Mix Surface Treatment will be paid under the respective items in the contract. The price adjustment, as provided herein, upwards or downwards, will be made at the end of each month in which the work was accomplished as follows:

A contract adjustment will be made under Item 1010.2 based on; [monthly price minus the base price] X [Approved Mix Design percent of virgin asphalt cement] X [tons of pavement used].

When no item for Asphalt Cement Adjustment is included in the contract no adjustments will be made.

Item 1010.2 Asphalt Cement Adjustment¹

Dollar

¹ Not a bid item

05/13/09

Page 1 of 4

SSD: 1/19/95, 4/6/99, 2/14/03 & 7/14/08

SPECIAL ATTENTION

HISTORIC AND ARCHAEOLOGICAL RESOURCES

In order to avoid impacts to archaeological resources, the Contractor shall obtain and submit to the Engineer a written certification from either: 1) the State Archaeologist, or 2) a qualified archaeologist as defined below prior to any offsite excavation or other work at any disposal site, haul road, storage area, staging area, or other areas located outside the right-of-way limits of the project. Such certification shall be made on one of the attached forms. One is intended for site clearance by the state archaeologist and the other for investigation by a qualified archaeologist. Any work in such areas may only commence after receipt of this certification and upon written authorization to proceed by the Engineer.

This Special Attention does not apply to natural materials obtained from pre-existing (i.e., owned and operated by the Contractor prior to bidding on the subject contract) and/or commercially available sources. Commercially available sources is meant to include licensed or permitted sources where anyone could purchase natural materials.

If the State Archaeologist determines that further field investigation is necessary the Contractor must decide whether to pursue alternative locations or to have the site(s) in question evaluated. If the latter is decided, it will be necessary for the Contractor and the Engineer to meet with the NHDOT Bureau of Environment, the Division of Historic Resources and the Federal Highway Administration to determine the appropriate course of action. Note that the latter parties meet twice a month on the first and second Thursdays of each month.

Professional Qualifications for Principal Investigators in Archaeological Investigations

All archaeologists contracting with NHDOT as principal investigators will be qualified for such work, as determined by NHDHR. See **list of qualified archaeological firms at [www.nh.gov/nhdhr/consultants archaeology.html](http://www.nh.gov/nhdhr/consultants_archaeology.html)**. According to NHDHR guidelines, principal investigators must meet the minimum standards presented in 36 CFR 61.

These regulations require a graduate degree in archaeology, anthropology, or related field; at least one year full-time professional experience or an equivalent period of training in archaeological research, administration, or management; at least four months of supervised field and analytical experience in general North American archaeology; and demonstrated capability to complete archaeological research through all its phases. These standards distinguish between the prehistorian and historical archaeologist. Each must have a specialization in his/her respective areas and at least one year of full-time professional experience at the supervisory level in the study of the Native American cultural traditions or the historic period.

36

July 14, 2008

Page 2 of 4

NHDHR also requires the following additional qualifications. All prehistorians will have at least one year of supervisory experience in the region encompassing the glaciated Northeast. Historical archaeologist will have a least one year of supervisory experience in New England, New Jersey, New York, or Pennsylvania. Historical archaeologists specializing in submerged nautical resources will possess at least one year's experience in the study of such resources along the Atlantic seaboard. NHDOT requires that the principal investigator has successfully completed one or more projects in New Hampshire in a timely manner. Principal investigators will be knowledgeable about the federal and state cultural resources management laws and regulations including those relating to the treatment of human remains in marked and unmarked graves. As soon as research or initial investigations indicate the likely presence of Native American or historic deposits, a principal investigator with training and experience in that area shall supervise the work.

The principal investigator is responsible for each aspect of the project. The principal investigator will maintain sufficient presence in repositories, the field, and laboratory to set up the study, ensure appropriate collection and accurate documentation of data, direct needed modifications as investigations proceed, field-check accuracy of field data, establish and direct analysis, and oversee documentation and preparation of recommendations at its close. In phases II and III as the intensity of excavation increases, it is anticipated that this presence will proportionately rise. All research, field investigations, analysis, and report preparation will be completed within the schedule set in the authorization of work unless notification is given and adequate justification is provided to NHDOT.

Depending on the nature of the site, the prehistoric or historic archaeologist may require additional qualifications or additional personnel qualified in other fields that may not be specified under 36CFR61. For example, projects for NHDOT encounter situations in which personnel with expertise and/or demonstrated experience in geomorphology, botany, faunal analysis, forensic anthropology, and industrial and urban archaeology are needed. These individuals will possess graduate training in their field, two years of professional experience in the area of expertise for which they are being consulted, and the demonstrated ability to complete a research project with a report of findings. Principal investigators may also need to add architectural historians, historians, historical landscape architects, etc. to their team whose professional qualifications will follow those provided in 36 CFR 61.

July 14, 2008

CERTIFICATION BY NHDHR

For the purpose of compliance with the Special Attention, Historic and Archeological Resources, dated February 14, 2003, relative to Federal-Aid Highway Project No. _____, NHDOT Project No. _____, I certify the following:

1. That I have reviewed the maps, plats, photographs or other identifying geographical information supplied to me by the Contractor.
2. That the areas located on these maps, etc. are to be utilized by the Contractor _____ for the following purposes:
 - a. Excavation area _____.
 - b. Waste material area _____.
 - c. Storage or staging area _____.
 - d. Haul road _____.
 - e. Other (describe) _____

3. That I have reviewed the NHDHR site files relative to these locations and proposed uses.
4. On the basis of the above information, I have concluded that:
 - a. The location(s) have been previously reviewed, no resources have been identified, and there is no need for further archaeological evaluation _____.
 - b. The location(s) are such that no further archaeological evaluation is necessary _____.
 - c. The location(s) are such that further field investigation is necessary _____.

NHDHR Review and Compliance Coordinator	Date
---	------

Received:

NHDOT Contract Administrator	Date
------------------------------	------

cc: FHWA
NH Division of Historical Resources
NHDOT, Bureau of Environment

38

July 14, 2008

CERTIFICATION BY ARCHAEOLOGICAL CONTRACTOR

For the purpose of compliance with the Special Attention, Historic and Archeological Resources, dated February 14, 2003, relative to Federal-Aid Highway Project No. _____, NHDOT Project No. _____, I certify the following:

- 1. That I have examined the areas identified on the attached plans, maps, or property plats.
- 2. That these areas are to be utilized by the Contractor _____ for the following purposes:
 - a. Excavation area _____.
 - b. Waste material area _____.
 - c. Storage or staging area _____.
 - d. Haul road _____.
 - e. Other (describe) _____

- 3. That I have used the following techniques in my examination:
 - a. Literature search _____
 - b. Walkover (describe methodology) _____
 - c. Subsurface testing (if appropriate) _____

4. That in my professional opinion, there is minimal or no likelihood that there are cultural resources (either historic or pre-historic) present or that any such resources present have integrity, and that there is no need for any other evaluative measures prior to the use of the areas described above for the purposes noted.

Archaeological Contractor _____
Date

Review by: _____
NHDHR Review and Compliance _____
Date
Coordinator

Received:

NHDOT Contract Administrator _____
Date

cc: FHWA
NH Division of Historical Resources
NHDOT, Bureau of Environment

39

04/07/09

SSD: 09/01/05

SPECIAL ATTENTION**SECTION 606 – GUARDRAIL****W-BEAM RAIL**

The NH Department of Transportation has adopted the standard height for new placement of w-beam guardrail to be **30 inches**, revising the 700 mm (27.5 inches) presently shown in the GR sheets of the Standard Plans.

There may be situations where standard beam guardrail, set at 30 inches high, will need to be connected to beam guardrail terminals that have only been crash tested at 27 inches high or bridge approach units that are designed at 27 inches high. This may reflect an existing or new installation. Similarly, new standard beam guardrail may be connected to existing beam guardrail that is not at the 30 inch height. In those circumstances transition the height over 50 feet of the standard rail that is connected to the terminal or bridge approach unit (transition shall be subsidiary to 606 Items).

Set the EAGRT heights according to the manufacturer's recommendation, as approved under the NCHRP 350 criteria. The ELT, MELT, and the CRT have only been tested at 27-inch height.

SPECIAL ATTENTION

INVASIVE SPECIES

Under the statutory authority of *RSA 430:55*, the NH Department of Agriculture, Markets, and Foods prohibits the spread of invasive plants listed on the NH Prohibited Species list. Construction activities should avoid impacting areas containing invasive plant species in order to avoid spreading these plants to new sites. If invasive plants cannot be avoided, then the following suggested best management practices (BMPs) should be incorporated into all projects. These BMPs have been summarized from the NHDOT manual "Best Management Practices for Roadside Invasive Plants."

Earthwork:

- Minimize soil disturbance whenever possible outside the limits of excavation.
- Stabilize disturbed soils by seeding and/or using mulch, hay, rip-rap, or gravel that is free of invasive plant material.
- Materials such as fill, loam, mulch, hay, rip-rap, and gravel should not be brought into project areas from sites where invasive plants are known to occur.

Movement of equipment:

- Equipment movement should be from areas not infested by invasive plants to areas infested by invasive plants whenever possible.
- Staging areas should be free of invasive plants to avoid spreading seeds and other viable plant parts.

Removing vegetation:

- In areas where invasive plants will be impacted by construction activities, vegetation should be cut or removed prior to seed maturation (approximately August 1st).
- These invasive plants have the ability to sprout from stem and root fragments: purple loosestrife, phragmites, and Japanese knotweed. Mowing these plants should be avoided. When these plants are cut by other means, all plant material must be destroyed and extra care should be taken to avoid spreading plant fragments.
- Equipment used to cut or remove invasive plants should be cleaned at least daily, as well as prior to transport.

The NHDOT manual "Best Management Practices for Roadside Invasive Plants" is available on line at www.nh.gov/dot/bureaus/environment/documents.htm or through the NHDOT Records Section (603) 271- 1601.

Items will be included in the contract under Sections 201 or 1008 for projects that will require these control methods.

4/19/94

SPECIAL ATTENTION**TRUCK LOADS EXCEEDING REGISTERED GROSS VEHICLE WEIGHT**

The Engineer will monitor highway vehicles for compliance with the vehicle's registered weight. If the Engineer discovers a violation, he or she will bring it to the attention of the Contractor.

If a prompt resolution to the problem is not achieved, the Engineer will notify the Contractor in writing of the following clause:

Effective immediately, the State will not pay for the portion of any load delivered to this project in excess of the load within that vehicle's registered gross vehicle weight and any applicable tolerances. The truck will be required to discharge its entire load, and payment will be made for the portion within that vehicle's registered gross vehicle weight at the unit bid price (or equivalent unit bid price for lump sum items).

03/04/09

Supersedes Spec. Attn. dated 1/7/00, 3/22/00, 6/14/00, 2/8/01, 4/2/01, 1/25/02, 4/1/02, 04/15/03, 04/20/04, 05/06/05, 05/19/06, 09/17/07, 06/12/08

SPECIAL ATTENTION

QUALIFIED PRODUCTS LIST

The Qualified Products List is published on an annual basis. Occasionally additional revisions occur. The current Qualified Products List, issue 2008-1 and a **Supplement** (dated February 25, 2009), may be purchased at the Bureau of Highway Design, Records Section, located at 7 Hazen Drive, Concord, NH 03302, Tel: (603) 271-3514 for a fee of \$5.00. Checks should be made payable to Treasurer, State of New Hampshire. The Qualified Products List and the Supplement are also available online at www.nhdot.com under the *Doing Business with DOT* link.

05/13/04

SSD: 2/1/2001;03/03/04

SPECIAL ATTENTION**TRAFFIC CONTROL DEVICES COMPLIANCE WITH NCHRP REPORT 350**

The following is a summary of work zone traffic control devices categories for to compliance with the National Cooperative Highway Research Program (NCHRP) Report 350, titled "Recommended Procedures for the Safety Performance Evaluation of Highway Features," testing and evaluation criteria as implemented by the AASHTO-FHWA Agreement (350 Agreement) dated July 1, 1998.

The FHWA has adopted the NCHRP Report 350 testing and evaluation criteria for work zone traffic control devices, and other safety features, to be used on the National Highway System (NHS). The FHWA has also adopted the recommendations of the 350 Agreement, which developed four categories of work zone devices and set the implementation dates for new devices in each category as described below.

Category I: Small, lightweight devices that are known to be crash-worthy from crash testing or years of demonstrable safe operational performance. These include plastic or rubber cones, tubular markers, flexible delineators, and plastic drums with no lights, batteries, signs, etc. added. For devices to be included in this category there must be virtually no potential that they will penetrate windshields, cause tire damage, or have a significant effect on the control or trajectory of an impacting vehicle. These devices will be allowed based upon developers self certification.

Category II: Devices that are not expected to produce significant vehicular velocity change, but may be otherwise hazardous. All or parts of the devices may be substantial enough to penetrate a windshield or injure a worker or they may cause instability when driven over or become lodged under a vehicle. The total mass of a Category II device must be less than 45 kg. Examples of this category are barricades, portable sign supports, intrusion detectors and alarms and drums, vertical panels, or cones with lights.

Category III: Devices expected to cause significant velocity change or other potentially harmful reactions in impacting vehicles and Category II devices with a mass greater than 45 kg. Examples of this category are Truck-mounted attenuators (TMA), portable crash cushions and Portable concrete barrier (requires appropriate sized pin and loop or better connection).

Category IV: Crashworthy installations of Category IV devices are encouraged, though not mandated. Announcement by FHWA of an implementation date will be made by October 1, 2006. Examples of this category are portable, usually trailer mounted devices such as area light supports, flashing arrow panels/arrows displays, temporary traffic signals and changeable message signs. .

All category I, II, and III project work zone traffic control devices in use, except portable concrete barrier that transfers tension and moment from segment to segment, shall conform to the testing and evaluation criteria of NCHRP Report 350. Devices not conforming to the criteria shall be replaced with conforming devices at no expense to the Department.

SPECIAL ATTENTION**RETROREFLECTIVE SHEETING**

Retroreflective sheeting for traffic control devices, including permanent and operational construction signing, shall conform to AASHTO M 268 (ASTM D 4956), Type III Retroreflective Sheeting as a minimum or Type VI for flexible base material. (See Section 619 for additional information.)

45-Y

6/11/07

SPECIAL ATTENTION**STANDARD BRIDGE PLANS**

The Contractor is advised that in the book Standard Plans for Road and Bridge Construction, the section titled Bridge Standard Plans is outdated and therefore, should not be used as a reference.

Updated standards are available on-line:

<http://www.nh.gov/dot/bureaus/bridgedesign/BridgeDesignStandards.htm>.

07/24/09

Page 1 of 2

SSD: 07/11/06, 07/18/06, 08/16/06, 10/18/06, 12/18/06, 01/07/07, 03/29/07, 03/29/07, 08/08/07, 09/07/07,
01/02/08, 04/02/08, 05/16/08, 06/27/08, 08/08/08, 10/31/08, 12/12/08, 02/19/09, 02/26/09, 03/03/09,
03/13/09, 04/09/09

SPECIAL ATTENTION

**THIS PROJECT IS TO BE BID AND CONSTRUCTED UNDER THE 2006
STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.**

NOTICE OF SUPPLEMENTAL SPECIFICATIONS

The following table is a list of all of the Supplemental Specifications that have been adopted as additions or revisions to the *Standard Specifications for Road and Bridge Construction, July 2006* Edition as of the date of this Proposal. All of the Supplemental Specifications are included and made a part of this Proposal. The Bidder is responsible to examine each item to determine its effect, if any, upon the Contract. All Supplemental Specifications are available on-line at:

www.nh.gov/dot/org/projectdevelopment/highwaydesign/specifications/.

Section	Description	Revision	Last Revision Date	Current Revision Date
<i>DIVISION 100</i>				
101.67	Major/Minor Contract Item definition	Last sentence	02/19/09	03/03/09
105.08	Construction Stakes, Lines, and Grades	2 nd paragraph (10/18/06)		10/18/06
106.10	Disposal Agreement			11/27/07
107.02	Permits, Licenses and Taxes	5 th paragraph		07/18/06
108.01	Subletting of Contract	2 nd , 3 rd , 8 th , 9 th & 11 th paragraph	09/06/07	10/31/08
108.09	Failure to Complete on Time	Liquidated Damages Schedule		01/29/07
109.04	Differing Site Conditions, Changes and Extra Work	Company Name Change (08/08/07) Regional Adjustment Factor	08/08/07	02/12/08
109.10	Acceptance and Final Payment	Last paragraph		02/10/07
<i>DIVISION 200</i>				
<i>DIVISION 300</i>				
304	Base Courses	Table 1		01/07/07
<i>DIVISION 400</i>				
401/403/410/ 411/413/417	Division 400 - Pavements	All Sections Revised		04/09/09

<i>DIVISION 500</i>				
520	Portland Concrete Cement	Table 1A		03/29/07
534	Water Repellant	1.1, 3.4, 3.4.3, 4.2, 4.3, 5.2, 5.3		06/04/08
537	Concrete Sealer	Delete Section 537		05/16/08
544	Reinforcing Steel	2.1.2		03/13/07
550	Structural Steel	<u>Add</u> : 3.11.6.1.4 (10/18/06)		10/18/06
562	Elastomeric Sealant	<u>Delete</u> Section 562		04/02/08
562	Silicone Joint Sealant	<u>Add</u> Section 562		04/02/08
<i>DIVISION 600</i>				
604	Catch Basins, Drop Inlets & Manholes	4.2, 5.2 (02/13/07)		02/13/07
618	Uniformed Officers & Flaggers	3.2.2.		12/12/08
619	Maintenance of Traffic	5.2, 5.2.1 (10/18/06)		10/18/06
632	Retroreflective Pavement Markings	2.3, 2.4, 2.4.1, 2.5.5.3, 3.1.1, 3.1.1.1, 3.2, and Pay Items		10/01/08
645	Erosion Control	1.1, 1.2, 2.1, 2.2, 3.4, 4.2, 5.1 and Pay Items	01/06/09	02/11/09
645	SWPPP Revisions and Addition Item 645.48	1.3, 3.1, 3.2, 3.9, 3.10, 4.8, 5.6, 5.7 – 5.10 and Pay Items		04/08/09
698*	Field Facilities	2.2.1		09/12/07
698*	Field Facilities (Computer Specification)	2.2.1 (05/05/03), (08/18/03), (02/22/05, 03/08/07)	08/03/07	06/27/08

* Supplemental will not be included if there is no Field Office item in the Contract.

SUPPLEMENTAL SPECIFICATION

SECTION 101 – DEFINITIONS AND TERMS

101.67 MAJOR AND MINOR CONTRACT ITEMS.

Amend Section 101.67 to read:

Any contract pay item for which the original unit bid price multiplied by the original item quantity exceeds the following minimum major item value based on total contract bid price or 3% of the total contract bid price, whichever is less. All other contract items are considered as minor items.

Total Contract Bid Price	Minimum Major Item Value
≤ \$1,000,000.00	\$25,000.00
> \$1,000,000.00 to ≤ \$5,000,000.00	\$100,000.00
> \$5,000,000.00 to ≤ \$20,000,000.00	\$300,000.00
> \$20,000,000.00	\$600,000.00

If no major contract items are identified using the above criteria, then the major item or items shall be the three (3) highest total dollar bid items, excluding Item 692 – Mobilization.

10/18/06

105
SS

Page 1 of 1

SUPPLEMENTAL SPECIFICATION

SECTION 105 -- CONTROL OF THE WORK

105.08 CONSTRUCTION STAKES, LINES, AND GRADES.

Amend the second paragraph of 105.08 to read:

The Engineer will take cross sections or topographic cross sections as required to complete measurement of quantities as provided in 109.01. This work includes reference points, base lines, stakes, bench marks, and cross sections for borrow pits where applicable.

50

12/9/1998

Supersedes Spec. Prov. dated 5/13/97

**CONCORD
13742C**

August 5, 2009

SPECIAL PROVISION**AMENDMENT TO SECTION 105 -- CONTROL OF WORK****AMENDMENT TO SECTION 105.12 - CONSTRUCTION ZONE(S)**

In accordance with Section 105.12 of the Standard Specifications, the construction work zone(s) designated for this contract shall extend 150 meters (approximately 500 ft), beyond the work limits as described below and/or as shown on the project layout map on the reverse of this page.

DESCRIPTION OF WORK LIMITS

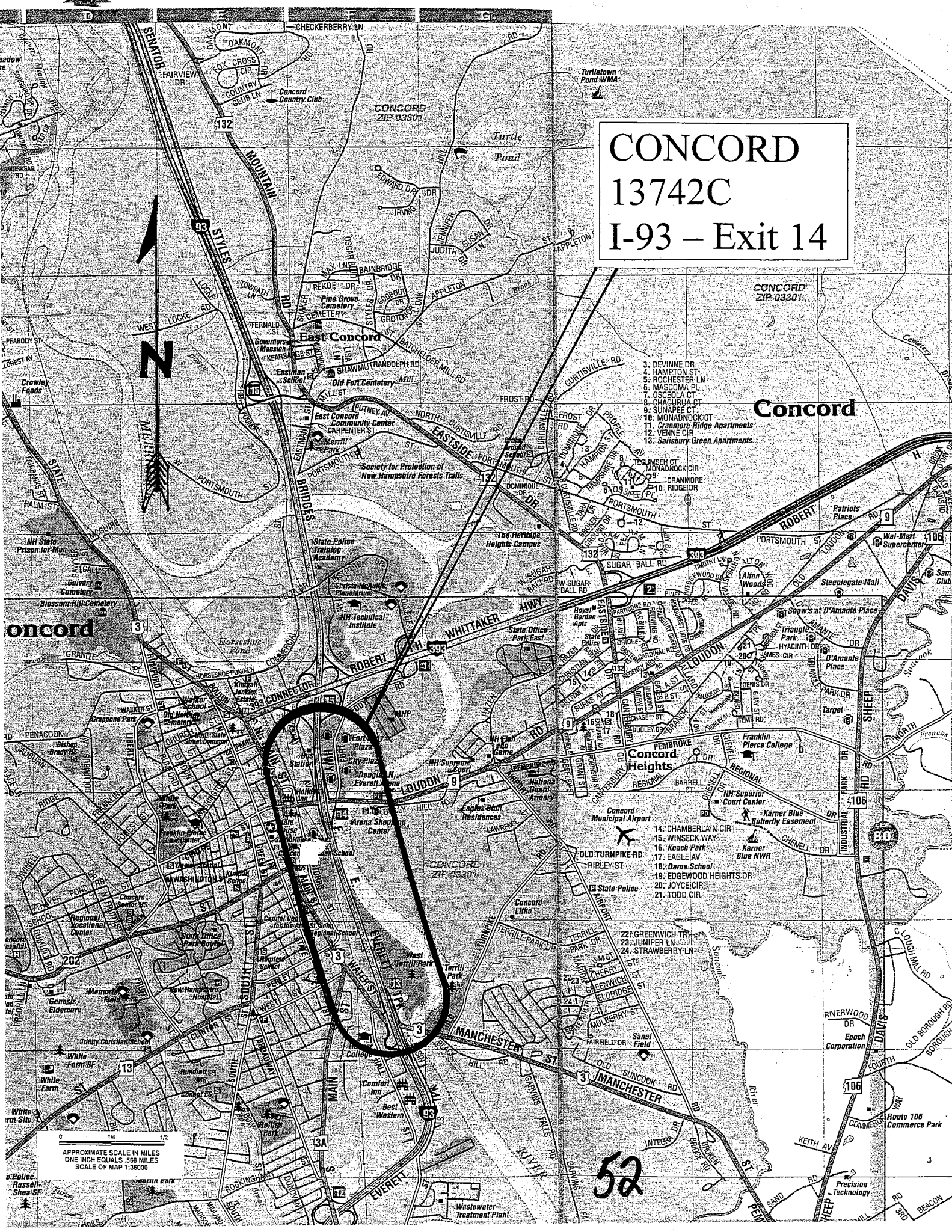
I-93 work will begin approximately 1250 south of the bridge over Manchester St (NH Rte 3) at Exit 13 and continue north 8600 ft to a point approximately 1250 north of the bridge over Loudon Rd (NH Rte 9) at Exit 14.

CONCORD
13742C
I-93 - Exit 14

Concord

- 3. DEVINNE DR
- 4. HAMPTON ST
- 5. ROCHESTER LN
- 6. MASCOMA PL
- 7. OSCOLA ST
- 8. CHAUNARA CT
- 9. SUNAPEE CT
- 10. MONADNOCK CT
- 11. Cranmore Ridge Apartments
- 12. VEVANE CIR
- 13. Salisbury Green Apartments

- 14. CHAMBERLAIN CIR
- 15. WINSECK WAY
- 16. Beach Park
- 17. Eagle Ave
- 18. Dame School
- 19. EDGEWOOD HEIGHTS DR
- 20. JOYCE CIR
- 21. TODD CIR



0 1/4 1/2
APPROXIMATE SCALE IN MILES
ONE INCH EQUALS .568 MILES
SCALE OF MAP 1:36000

52

SUPPLEMENTAL SPECIFICATION

SECTION 106 -- CONTROL OF MATERIAL

Amend the Disposal Agreement form under 106.10 to read:

Rev. 2/07	STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION DISPOSAL AGREEMENT (This does not apply to disposal areas operated by a public agency)	
Source: NHDOT Project Name: _____ Project Number: _____		
Disposal Site: Property Owner(s): _____		
Site Address: _____ Town: _____ State: _____		
Type of Site: <input type="checkbox"/> Private Residential <input type="checkbox"/> Private Commercial <input type="checkbox"/> Under Commercial Development <input type="checkbox"/> Materials Handling Facility (pit, quarry, landfill, etc.)		
Volume of material to be disposed of (c.y.): _____ Area of disposal site (sq. ft., acres): _____ (May require payment of excavation tax per 107.02)		
Attach a drawing of the site that shows: property lines, roads, driveways, buildings, and disposal area limits.		
This form sets forth the conditions under which the Department will approve the disposal of surplus or waste material by a Contractor who, under contract as an agent of the Department, seeks to open and operate a disposal site on the referenced property in accordance with Section 106, 201 and 203 of the New Hampshire Department of Transportation Standard Specifications for Road and Bridge Construction applicable to the referenced project.		
By signature herein, the Contractor (agent) and the property owner(s) acknowledge and agree to the following conditions and specifications subject to Departmental approval:		
(1) Prior to the start of disposal operations, this agreement shall be executed by the Contractor, the property owner(s), and the Department's Contract Administrator, with written approval received from the Department.		
(2) The Contractor shall not dispose of material considered to be hazardous or injurious to public welfare, including contaminated soils and asbestos, except as permitted by federal, state, and local regulations. Solid waste shall be disposed of according to all federal, state, and local regulations.		
(3) Prior to the start of disposal operations, the Contractor shall complete a Historic and Archaeological Resources certification in accordance with the Contract, for areas affected by the disposal or by any haul road constructed for access to the disposal area.		
(4) Prior to the start of disposal operations, the Contractor shall investigate impacts on existing wetlands by arranging for a qualified person recognized by the Department of Environmental Services (NHDES) capable of performing such an investigation. The Contractor shall apply for, and receive from the NH Wetlands Bureau, any wetlands permit(s) required prior to the start of disposal operations.		
(5) Pursuant to Executive Order 11988, dated May 24, 1977, the Contractor shall not dispose of materials within the boundaries of any floodway, or within the limits of any 100 year floodplain, or within any area that violates Executive Order 11988 without the expressed written permission of appropriate federal, state, and local agencies. It shall be the responsibility of the Contractor to ascertain and mark the boundaries of such floodway and floodplain using available information from federal, state, and local resources.		

53

- (6) Approval by the Department to open and operate the disposal area will expire at the specified or extended completion date of the project. Access roads to the area adjacent to highways shall be obliterated unless permission is given by the Department to preserve such access roads. If the Contractor has removed screening trees and brush between the highway and the disposal area, the area shall be replanted to provide a similar screen in a zone along the edge of the disposal area as directed by the Department.
- (7) Disposal or transportation of material by the Contractor shall not be exempt from local zoning or other applicable ordinances. The Contractor shall apply directly to local municipalities for possible exemptions to such ordinances.
- (8) Disposal of brush from clearing and grubbing operations shall be as specified in Section 201 of the Standard Specifications. Disposal of surplus and waste material from roadway excavation shall be as specified in Section 203 of the Standard Specifications. Reclamation of the disposal area shall meet the requirements of **RSA 155-E:5, I, II, III, IV, and V** (for excavation sites) prior to Project Acceptance.

Prior to acceptance of the project, the Contractor shall finish the disposal area in accordance with the noted RSA's and applicable specifications. By the box(es) checked below, the property owner(s), the Contractor, and the Department's Contract Administrator shall agree on the specific minimum landscaping treatment required in order for the reclamation to be acceptable to the Department:

- The entire area is to be covered with humus, fertilized and seeded.
or
- The entire area is to be covered with humus and planted with seedlings.
or
- The area is part of an active, ongoing site development and/or construction project. Landscaping will be the responsibility of the property owner.

Additional landscaping required and any pertinent information desired to be a part of the official record is attached, or noted below:

The site was reviewed and landscaping provisions approved by: _____
NHDOT Contract Administrator Date

The Contractor's attention is directed to **RSA 482-A:3**, the requirements of which must be fulfilled if this disposal area involves excavation or dredging of wetlands. Furthermore, the Contractor's attention is directed to **RSA 483-B** and **RSA 485-A:17**, the provisions of which must be fulfilled if this disposal operation involves filling on the border of the surface waters of the state or will significantly alter the characteristic natural runoff or create an unnatural runoff, and **RSA 149-M** if the Contractor intends to dispose of solid waste, including stumps. The Contractor's attention is also directed to Section 10 of the Rivers and Harbors Act of 1899, and Sect. 401 & 404 of the Clean Water Act, for which compliance may require a permit for work in or affecting "navigable waters of the U.S.," or material placed in "waters of the U.S.," including wetlands. The Contractor's attention is also directed to Executive Order 11990 if this disposal area will affect wetlands.

- This disposal area is covered by a NHDES Site Specific Permit with it's own SWPPP.
NHDES Site Specific Permit Number: _____
or
- The source project SWPPP will be modified to include this site. Installation, monitoring, and maintenance of erosion control measures will be the responsibility of the Prime Contractor.
- NOTICE OF INTENT TO EXCAVATE FILED OPERATION # _____

54

Signature of Owner

Date

Name(s) of Joint Owner(s)

Street

Street

Town

State

Town

State

Prime Contractor

By (Signature)

Date

If joint owners are involved, the Owner signing should give all other names and addresses. Separate forms should be filed in connection with adjacent owners.

Distribution: Contract Administrator Construction Bureau
 Property Owner Contractor Environmental Coordinator

55

SUPPLEMENTAL SPECIFICATION
AMENDMENT TO SECTION 107 – LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC
AMENDMENT TO SUBSECTION 107.02 – PERMITS, LICENSES, AND TAXES

Amend the 5th paragraph of 107.02 to read:

The Contractor's attention is further called to RSA 72-B, Excavation Tax and related administrative rules of the Department of Revenue Administration, which among other provisions, levies a tax on earth and excavations as defined in RSA 155-E. The Contractor is required, on a yearly basis, to file a Notice of Intent to Excavate in each municipality where excavation operations are anticipated. Additionally, the Contractor shall post the Excavation Tax Certificate, received from the Department of Revenue Administration, at the Contractor's project bulletin board.

56

SUPPLEMENTAL SPECIFICATION

SECTION 108 -- PROSECUTION AND PROGRESS

SUBSECTION 108.01 – SUBLETTING OF CONTRACT

108.01 Subletting of Contract. The Contractor shall not sublet, sell, transfer, assign, or dispose of any portion of the Contract or Contracts without written consent of the Department. The Contractor's organization shall perform work amounting to not less than 50 percent of the total Contract bid amount unless a higher percentage is specified in the Contract. Items designated in the Contract as "specialty items" may be subcontracted and the cost of specialty items performed by subcontract may be deducted from the Total Bid amount before computing the amount of work required to be performed by the Contractor's own organization. Any subcontracts, or transfer of Contract, shall not relieve the Contractor, bonding company or Surety of liability under the Contract and Bonds.

For proposed subcontractor and/or lower tier subcontractor approval, the Contractor shall file a copy of the executed subcontract agreement with the Bureau administering the Contract at least five working days prior to the requested subcontract work being started. Retroactive subcontract and/or lower tier subcontract agreements will not be allowed.

On Federal-Aid projects, it is a requirement that the following documents be incorporated in and made a part of every subcontract agreement (including lower-tier subcontract agreements):

- NH DOT Policy on Subcontracting
- Required Contract Provisions (FHWA-1273)
- Disadvantaged Business Enterprise (DBE) Policy (SPECIAL ATTENTION item)
- DBE Program Requirements (Standard Spec 103.06)
- *41 CFR 60-4.2 – Solicitations
- *41 CFR 60-4.3 – Equal Opportunity Clauses
- Payroll/Wage Requirements Summary
- **U.S. Department of Labor wage rates entitled "GENERAL WAGE DECISION" (as contained in the contract)
- *Applicable only to contracts or subcontracts in excess of \$10,000
- **Does not apply to Material Suppliers, unless performing work on site

In addition to the above requirements in accordance with New Hampshire law (RSA 228:4-b), prior to any on-site work being performed on any highway, bridge or other construction, reconstruction, alteration or maintenance project funded by the Department, each Contractor, Subcontractor, Lower-tier Subcontractor, to include an Independent Contractor, must submit a "Work Certificate" with supporting documentation and obtain approval from the Bureau administering the project.

For unforeseen work of a value less than \$10,000.00, the Contractor may obtain interim consent to sublet work from the Contract Administrator; provided Interim Consent to Sublet Form is executed between the two parties and the Contract Administrator. In addition, the Subcontractor, Lower-tier Subcontractor, or Independent Contractor to perform work must submit a "Work Certificate" with supporting documentation and obtain approval from the Contract Administrator before interim consent is granted. This interim consent to sublet work also requires submission of all documents noted above to the Bureau administering the Contract. Consent by the Bureau

administering the Contract must be granted prior to any payment for work accomplished under this interim agreement process.

The Contractor shall not knowingly sublet, sell, transfer, assign, or dispose of any portion of the Contract or Contracts with any person or entity which, under any federal or state law or regulation, or by voluntary agreement, is currently debarred or disqualified from bidding for construction contracts or participating in construction projects in any jurisdiction of the United States, unless after disclosure of such ineligibility, such participation is authorized by appropriate federal and State authorities, including the Engineer. No payment will be made for work performed by any such contractor.

Submission of certified payrolls as required during the course of the Work shall establish final minimum wage rate certification of all work sublet, assigned, or otherwise disposed of in any manner during completion of the Contract. Truck owner-operators are not subject to the wage rates prescribed by the Department of Labor. Such owner-operators shall be listed on payrolls with the notation "Truck Driver owner-operator" in the Work Classification column. Neither the hours neither worked nor wages paid need to be shown.

The Department will furnish copies of the Required Contract Provisions, notices, report forms, Acknowledgment Certification and Transmittal Requests for subcontractor approval to the apparent low bidder following bid openings.

Transmittal requests shall indicate either "subcontractor," "lower-tier subcontractor" or "material supplier" and shall include a copy of the subcontract agreement attached to a certification that all required Contract provisions, notices and report forms are a part of each subcontract.

If, during the course of the Work, a Subcontractor or Lower-tier Subcontractor fails to complete or perform satisfactory work the Contractor shall complete the Work itself or with another approved subcontractor. The Contractor shall not substitute another subcontractor for an approved subcontractor except for reasons acceptable to the Department nor shall an approved subcontractor be allowed to perform work not prescribed in the executed agreement on file without prior consent by the Department.

Any Contractor, Subcontractor, or Lower-tier Subcontractor found to be in violation of the Required Contract Provisions made part of its contract shall be required to take corrective action before participating in future projects funded by the Department. Corrective action shall include, but is not limited to, the submission of certified payrolls or other records and reports necessary to verify compliance with the Provisions. Any Contractor, Subcontractor or Lower-tier Subcontractor found to have repeatedly violated the Required Contract Provisions may be required to complete 4-hours of Federal Contract Compliance Training conducted by the NH DOT Office of Federal Compliance. When mandated, Federal Contract Compliance Training must be completed before participation on future projects is authorized. This requirement does not relieve the Contractor of its obligations under the prime contract, nor does it prevent the Department from seeking other remedies or enforcement action, as provided by the governing Rules, Laws, and Federal Regulations.

Any Subcontractor, Lower-tier Subcontractor, or Independent Contractor performing work without consent by the Department shall be required to suspend Work until a "Work Certificate" is submitted. Any Subcontractor, Lower-tier Subcontractor, or Independent Contractor that fails to comply with this requirement may be reported to the New Hampshire Department of Labor for review under RSA 228:4-b.

**CONCORD
13742C**

August 12, 2009

SPECIAL PROVISION

AMENDMENT TO 108 – PROSECUTION AND PROGRESS

AMENDING SUBSECTION 108.01 – SUBLETTING OF CONTRACT

Amend the second sentence of the first paragraph to read:

The Contractor's organization shall perform work amounting to no less than 40 percent of the total contract bid amount.

59

August 14, 2009

SPECIAL PROVISION**SECTION 108 -- PROSECUTION AND PROGRESS**

Amend the 1st paragraphs of 108.03 and 108.03.A to read:

108.03 Pre-Construction Activities.

Prior to commencement of any major work on the Project, a pre-construction conference shall be held to discuss major project requirements and coordinate the Work of the Contractor, various utilities for utility relocations, and subcontractors. The Contractor shall be prepared to discuss in detail the proposed Construction Schedule, the SWPPP and the traffic control plan particularly as these relate to coordination with schedules of the utilities and subcontractors. In addition, the Contractor shall be prepared to provide details on the sources and delivery of critical materials.

The Contractor shall submit a written SWPPP, and a traffic control plan to the Engineer for approval in accordance with 105.02. The Contractor shall submit a Construction Schedule to the Engineer for documentation in accordance with 105.02; the Engineer reserves the right to approve form and content of the Construction Schedule. The submission shall include at a minimum a paper copy, and an electronic copy of the Construction Schedule.

A. Construction Schedule. Sufficient materials, equipment and labor shall be provided by the Contractor to guarantee completion of the project within the Contract Time. The construction Schedule will be used to establish the critical construction operations and to monitor the progress of the Work. No work shall proceed on the project, other than mobilizing, installation of the permanent construction signs, and installing the field office, until the initial Construction Schedule has been submitted and accepted.

The Construction Schedule shall be, at a minimum, a CPM (Critical Path Method) computer generated Time Scaled Logic diagram, or an Activities Schedule diagram. The diagram shall show major construction activities, project phasing, controlling activities, project required milestones, activity durations by working day or calendar day, and project suspensions that are 3 days or longer. Major activities shall include activities such as installation of cofferdam, excavate bridge footing, pave top at areas designated, etc. Subcontractor work, utility relocation work, submission of any working drawings including the review periods indicated in 105.02 for each submission, and manufacturing of key components shall be included as major activities. The Construction Schedule shall include the proposed utility relocation schedule as outlined in the Prosecution of Work. Controlling activities shall be determined by the Contractor as those activities that, if

delayed, would delay project completion. Milestones shall include the start of the project, winter suspensions if planned, project intermediate and final completion dates. All work shall be scheduled to be completed by or prior to project required milestones. No claim for compensation related to loss of time other than as provided for in 104.02, 104.03, and 104.04 will be considered by the Department.

Activities Schedule: The Activities Schedule diagram shall consist of a computer generated chronological sequenced bar chart showing construction prosecution. Activity descriptions for each work category and activity duration shall be shown. Work process sequence shall show the interdependence of work items to complete the work.

Critical Path Method (CPM) Schedule: The Contractor shall use either Microsoft Project or Primavera Scheduling software to develop and manage the Critical Path Schedule. The Contractor shall notify the Engineer in writing, when submitting the first schedule, which software will be used. This choice cannot be changed after the first submittal. When the Contractor uses Primavera scheduling software, an additional electronic copy of all required schedule and reports converted to the Microsoft Project format on floppy disk and/or compact disk, shall be submitted for Information only. This additional information shall be submitted with all schedule submittals and updates. The Contractor shall perform all work required to ensure that the Microsoft schedule accurately reflects the planned schedule and progress. A copy of the Contractor's scheduling software shall be provided for the duration of the project for use by the Contract Administrator.

A series of construction activities could be defined as a single activity rather than three, for example, "form, reinforce, and place pier concrete" could be grouped as a single activity.

Time Scaled Logic Diagram: This diagram shall show the logical progression of all activities required to complete the Work defined in the Contract. Activity information shall include activity ID, description, duration, early start and finish dates, late start and finish dates, total float, and responsibility. The Critical Path for the Project shall be clearly defined.

- (1) Project Schedule. The Project Schedule submittal shall consist of a Time Scaled Logic Diagram Schedule Report. It shall be prepared in full and submitted to the Engineer. The Schedule shall include procurement and submittal activities.

The Project Schedule shall cover the time from the date of Notice to Proceed to anticipated completion date.

The Schedule Report shall tabulate for each activity the activity ID, description, duration, earliest start and finish date, latest start and finish date, total float time, predecessor and successor activities, and responsibility.

- (2) Schedule Updates. The Contractor shall submit an updated Construction Schedule bi-monthly or as requested by the Department, in paper and electronic

format, as necessary to reflect actual project conditions and progress. The revised Construction Schedule shall show completion of the Work within the Contract Time and the Contractor shall modify operations to provide such additional materials, equipment, and labor necessary to meet the revised schedule. Should the prosecution of the Work be discontinued for any reason, the Contractor shall notify the Engineer at least three working days in advance of resuming operations.

Each of the diagrams, charts, and reports shall comply with the requirements for the Project Schedule above, except that they shall also include actual completion dates and percentages of completion for the appropriate activities.

A job Progress Narrative Report shall also be submitted with all updates. It shall detail the description of job progress, problem areas, current and anticipated delaying factors and their anticipated effects, impacts on job milestones or project completion, any corrective action proposed or taken, and any minor revisions to the Schedule.

Additional updates of the Schedule may be required, as determined by the Engineer, for: a major revision in the schedule logic or methods of construction; the addition, deletion, or revision of activities required by Contract modification; delays in milestones or the completion of the project; or for prosecution of Work that revises phasing or staging which is represented on the Plans of on the progress schedule. These updates shall be submitted within 7 calendar days of request.

The Contractor shall participate in the Engineer's review of the submittals. Meetings will be held to review progress and planning when requested by the Engineer.

The Contractor shall prosecute the Work according to the Schedule. The Contractor shall ensure that its subcontractors, suppliers, and engineers, at any tier; also prosecute the Work according to the Schedule.

Acceptance of the Contractor's Schedule by the Engineer is not to be construed as relieving the Contractor of obligations to complete the Contract Work within the Contract time allowed for the portion of work, or the entire Contract.

All costs relating to the preparation, submittal, and acceptance of the Schedule, reports and revisions, and all requirements of this subsection are incidental to Contract bid items.

Receipt of the Construction Schedule and, or updates may impact progress payments.

CPM Schedules for Weekend Closure Periods: In addition to the requirements listed above, the Contractor shall prepare separate and detailed CPM schedules for each of the two weekend closure periods. The Contractor is encouraged to develop, implement, and maintain construction work schedules that complete the work required within the allotted 60-hour closure periods (7:00 PM Friday through 7:00 AM Monday). See the Special Provision amending Subsection 108.08 for additional details on Incentives/Disincentives for early completion of the work.

These detailed Construction Schedules shall be, at a minimum, a CPM (Critical Path Method) computer generated Time Scaled Logic diagram, or an Activities Schedule diagram. The diagrams shall show major construction activities, project phasing, controlling activities, project required milestones, and activity durations in one hour maximum increments.

The Contractor shall develop the schedule based on anticipated construction activities (tasks), which shall include the following minimum task list:

Table 1
Minimum Task List for Weekend Closure Schedules

Task ID	Task Description	Duration (Hours)	Start Time	Finish Time
1000	Shift Traffic and Install Temporary Barrier			
1100	Bridge Deck Removal and Excavation			
1200	Remove Existing Shear Connectors			
1300	Install Precast Deck Panels			
1400	Adjust Precast Deck Panel Leveling Devices			
1500	Install Post-Tensioning Strands			
1600	Grout Transverse Shear Keys			
1700	Grout Cure Wait Period			
1800	Stress Post-Tensioning Strands			
1900	Grout Post-Tensioning Ducts			
2000	Install Shear Connectors			
2100	Form and Pour Cast-in-Place Deck Ends			
2200	Concrete Wet Cure and Wait Period			
2300	Grout Shear Stud Pockets			
2400	Grout Cure Wait Period			
2500	Install Vertical Membrane at Abutments			
2600	Place Pavement at Abutments			
2700	Install Temp. Barrier and Pavement Markings			
2800	Shift Traffic			

63

11/20/97

1 of 1

Supersedes Spec. Prov. dated 10/11/83 & 1/11/91

CONCORD
13742C

August 19, 2009

SPECIAL PROVISION

AMENDMENT TO SECTION 108 -- PROSECUTION AND PROGRESS

**AMENDING SUBSECTION 108.07 - DETERMINATION OF COMPENSATION AND
CONTRACT TIME EXTENSION FOR EXCUSABLE, NONCOMPENSABLE AND
COMPENSABLE DELAYS**

Amend the third paragraph to read:

When the contract sets forth a calendar completion date, due consideration will have been given to the Saturdays, Sundays, legal holidays, and the period between December 1 and April 1 inclusive in the anticipated period of construction. No extension of the contract completion date will be allowed due to such days. When the contract stipulates a completion date that falls on a Saturday, Sunday, or legal holiday, and when the time as extended by the Engineer falls on a date which is a Saturday, Sunday, or legal holiday, the date will be extended to the next working day. **No consideration will be given for unfavorable weather or ground conditions.** Working days will be added when the final Contract amount is greater than the original Contract Bid (Total), computed as follows: The ratio of the number of extra allowable working days to the number of working days between the date of beginning of work and the contract completion date (not counting the period December 1 through April 1) is the same as the ratio of the final Contract amount less the original Contract Bid (Total) to the original Contract Bid (Total).

$$\frac{\text{Extra Allowable Working Days}}{\text{Original Allowable Working Days}} = \frac{\text{Final Contract Amount} - \text{Original Contract Bid (Total)}}{\text{Original Contract Bid (Total)}}$$

Amend the fifth paragraph to read:

- A. Excusable or Noncompensable Delay. Contract time allowed for the performance of the work may be extended for delays caused by natural disasters, acts of the public enemy, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, utility relocations, right-of-way problems, extra work of added complexity or ordered done at a late or unfavorable stage of construction, work requiring the use of specialists for whose starting time a reasonable latitude must be allowed, delays or suspensions made necessary by an emergency episode procedure carried out under the direction of the New Hampshire Department of Environmental Services, Division of Air Resources. The Contractor's contention that insufficient time was specified is not a valid reason for extension of time.

64

CONCORD
13742C

August 12, 2009

SPECIAL PROVISION**AMENDMENT TO 108 – PROSECUTION AND PROGRESS****AMENDING SUBSECTION 108.08 –
INCENTIVE/DISINCENTIVE FOR EARLY COMPLETION**

Add to end of 108.08:

INCENTIVES AND NO EXCUSE BONUSES

The Contractor will be paid Incentives and/or No Excuse Bonuses for early completion of work as described herein. The Intermediate Completion Dates associated with the Incentives and No Excuse Bonuses are defined in the Prosecution of Work.

Time charges for computing Incentives and/or No Excuse Bonuses for Intermediate Completion Dates will not be adjusted for weather, weekends, holidays, suspension of contract time, unforeseen utility or right of way issues, or any other unforeseeable event not under the direct control of the Department.

Time charges for computing bonuses for Intermediate Completion Dates may be adjusted by the Engineer when work, under the direct control of the Department such as extension of limits or changes in scope not related to the issues in the previous paragraph, is added that changes the duration of the work required for the Intermediate Completion Date.

Time charges for computing bonuses for Intermediate Completion Dates may be adjusted for catastrophic events such as a declared state of emergency or natural disaster, if the event directly affects the Contractor's project operations.

Intermediate Completion Date #1: A \$100,000 No Excuse Bonus will be awarded to the Contractor for having all four travel lanes on Interstate 93 reopened to traffic through the work area prior to Intermediate Completion Date #1.

A \$1,250 hourly Incentive will be paid for each full hour that all travel lanes on Loudon Road are reopened to traffic within the project area, prior to Intermediate Completion Date #1. The maximum payment for the Loudon Road Incentive is \$30,000 for Intermediate Completion Date #1.

65

Intermediate Completion Date #2: A \$100,000 No Excuse Bonus will be awarded to the Contractor for having all four travel lanes on Interstate 93 reopened to traffic through the work area prior to Intermediate Completion Date #2.

A \$1,250 hourly Incentive will be paid for each full hour that all lanes on Loudon Road are reopened to traffic within the project area, prior to Intermediate Completion Date #2. The maximum payment for the Loudon Road Incentive is \$30,000 for Intermediate Completion Date #2.

In addition, a \$40,000 No Excuse Bonus will be awarded to the Contractor for meeting the I-93 lane opening requirements specified above for both Intermediate Completion Date #1 and Intermediate Completion Date #2. If the Contractor fails to meet the I-93 lane opening requirements for either one of the two Intermediate Completion Dates, this final No Excuse Bonus will not be awarded.

DISINCENTIVES

The Contractor will be assessed Disincentive charges for late completion of work as described herein. The Intermediate Completion Dates associated with the Disincentives are defined in the Prosecution of Work. The road-user cost disincentives will be assessed not as a penalty, but for added expense incurred by the traveling public. The amount of the Disincentive will be deducted from money due or to become due to the Contractor.

Intermediate Completion Date #1: An unlimited disincentive of \$3,750 per hour will be assessed to the Contractor for each full hour beyond Intermediate Completion Date #1 that all four travel lanes on Interstate 93 are not reopened to traffic. In addition, an unlimited disincentive of \$1,250 per hour will be assessed to the Contractor for each full hour beyond Intermediate Completion Date #1 that all lanes on Loudon Road are not reopened to traffic within the project area.

Intermediate Completion Date #2: An unlimited disincentive of \$3,750 per hour will be assessed to the Contractor for each full hour beyond Intermediate Completion Date #2 that all four travel lanes on Interstate 93 are not reopened to traffic. In addition, an unlimited disincentive of \$1,250 per hour will be assessed to the Contractor for each full hour beyond Intermediate Completion Date #2 that all lanes on Loudon Road are not reopened to traffic within the project area.

EXAMPLES

The following are examples of No Excuse Bonus awards, Incentive payments, and Disincentive charges for given scenarios:

Scenario 1 – Phase 1 work is completed early and all Interstate 93 traffic lanes were reopened prior to Intermediate Completion Date #1: A No Excuse Bonus of \$100,000 would be awarded.

66

Scenario 2 – All travel lanes on Loudon Road were reopened to traffic within the project area, **12 hours** prior to Intermediate Completion Date #1: An Incentive payment of \$15,000 would be awarded.

Scenario 3 – Phase 1 work is completed late and all Interstate 93 traffic lanes, and all travel lanes on Loudon Road are not reopened until five and one half hours after Intermediate Completion Date #1. The No Excuse Award Bonus would not be awarded, and a disincentive of \$25,000 would be charged.

The maximum combined contract Incentives and No Excuse Bonus awards shall not exceed \$300,000. There is no upper limit to the dollar amount of the disincentive clauses.

Add pay items and units:

1010.5	Completion Incentive/Disincentive	\$
--------	-----------------------------------	----

The total allowance for Item 1010.5 on this project has been set as \$300,000.00.

SUPPLEMENTAL SPECIFICATION

SECTION 108 -- PROSECUTION AND PROGRESS

SUBSECTION 108.09 - FAILURE TO COMPLETE ON TIME

Amend 108.09 to read:

108.09 Failure to Complete on Time. For each calendar day or work day that work remains uncompleted after the Contract Time, the sum specified below will be deducted from any money due the Contractor. This sum shall not be considered and treated as a penalty but as liquidated damages due the Department by reason of inconvenience to the public, added cost of engineering and supervision, and other extra expenditures of public funds due to the Contractor's failure to complete the Work on time. Any adjustment of the Contract Time for completion of the Work granted under the provisions of 108.07 will be considered in the assessment of liquidated damages.

In the case of a date in the Contract being given for the completion of parts, phases, or stages, the liquidated damages will be deducted for the period in which that particular work specified is uncompleted.

Permission for the Contractor or Surety to continue and finish work after the Contract Time and approved extensions have elapsed shall not waive the Department's rights under the Contract.

The assessment of all or any of the liquidated damages that accrue may be terminated if the Department has determined that the Work is substantially complete and is in a condition for safe and convenient use by the traveling public.

The Work will be considered substantially complete when all necessary signing, striping, guardrail, and other safety appurtenances have been installed. For projects that will not be opened to the traveling public, the Contract will be considered substantially complete when it is ready for the subsequent project. This shall not be construed as a contractual right and its application will be contingent upon the Contractor's diligence in completing the remaining items of work.

Liquidated damages shall be assessed in accordance with the following schedule:

<u>Original Contract Amount</u>		<u>Daily Charge</u>	
From more than	To and including	Calendar Day	Working Day
\$ 0	\$ 25,000	\$ 167	\$ 250
25,000	50,000	200	300
50,000	100,000	317	475
100,000	500,000	367	550
500,000	1,000,000	633	950
1,000,000	2,000,000	933	1400
2,000,000	5,000,000	1267	1900
5,000,000	10,000,000	1567	2350
10,000,000	----	1867	2800

When the Contract Time is on the calendar date basis, the schedule for calendar date shall be used. When the contract time is on a working day basis, the schedule for working days shall be used.

When Acceptance has been made by the Engineer as prescribed in 105.17, the daily charge will no longer be assessed.

68

01/29/07

Should the amount of money otherwise due the Contractor be less than the amount of such liquidated damages, the Contractor and the Surety shall be liable to the State for such deficiency.

The Engineer has the right to deduct the amount of anticipated liquidated damages against the Contractor from any estimated payment for Work performed under the Contract; or to claim and recover such sums by process of law. Review of anticipated Contract completion and potential liquidated damages will commence when 80% of the original Contract time has elapsed.

69

S U P P L E M E N T A L S P E C I F I C A T I O N

AMENDMENT TO SECTION 109 -- MEASUREMENT AND PAYMENT

**AMENDMENT TO SUBSECTION 109.04 - DIFFERING SITE CONDITIONS,
CHANGES AND EXTRA WORK.**

Amend the following sentence of 109.04(D)(3) to read:

Equipment and Plant. For any Contractor-owned machinery or special equipment (other than small tools), the use of which is approved by the Engineer, the hourly rate will not exceed that determined from the latest edition of the "Rental Rate Blue Book for Construction Equipment" published by EquipmentWatch used in the following manner:

Add the following after the first sentence of 109.04(D)(3)(d):

The average regional adjustment factor is **0.95**.

SUPPLEMENTAL SPECIFICATION**AMENDMENT TO SECTION 109 – MEASUREMENT AND PAYMENT****AMENDMENT TO SUBSECTION 109.10 – Acceptance and Final Payment**

Amend the last paragraph of 109.10 to read:

All prior partial estimates and payments shall be subject to correction in the final estimate and payment. If the final estimate shows an overpayment was made to the Contractor, then the Contractor shall pay this amount to the Department within 60 days of receipt of the final estimate, unless a valid claim has been filed in accordance with 105.18. If the Contractor fails to make the reimbursement as prescribed, the Department will send a Notice of Non-Payment letter giving the Contractor an additional 30-days to make payment. If payment is not received as prescribed the Department will, in writing, temporarily suspend the Contractor's bidding privileges for 60 days. If the Contractor fails to make the reimbursement within the suspension, the Department will, in writing, initiate steps to remove the Contractor from the Pre-Qualifications list and refer the matter to the Attorney General's Office for further action and Bonding Company notification.

SUPPLEMENTAL SPECIFICATION
AMENDMENT TO SECTION 300 -- BASE COURSES

AMENDMENT TO SECTION 304-- AGGREGATE BASE COURSE

Amend Table 1 to say:

Table 1 -- Base Course Materials							
Required Gradation							
Item No.	304.1	304.2	304.3	304.33	304.4	304.5	304.6
Item	Sand	Gravel	Crushed Gravel	Crushed Aggregate For Shoulders	Crushed Stone (Fine)	Crushed Stone (Coarse)	Crushed Stone (Very Coarse)
Sieve Size	Percent Passing By Weight						
6 in. (150 mm)	100	100	---	---	---	---	100
5 in. (125 mm)	---	---	---	---	---	---	---
4 in. (100 mm)	---	---	---	---	---	---	---
3 ½ in. (90 mm)	---	---	---	---	---	100	---
3 in. (75 mm)	---	---	100	---	---	85 – 100	60-90
2 ½ in. (63.5 mm)	---	---	---	---	---	---	---
2 in. (50 mm)	---	---	95 – 100	---	100	---	---
1 ½ in. (37.5 mm)	---	---	---	100	85 – 100	60 – 90	45-75
1 in. (25.0 mm)	---	---	55 – 85	90 – 100	---	---	---
¾ in. (19.0 mm)	---	---	---	---	45 – 75	40 – 70	35-65
#4 (4.75 mm)	70 – 100	25 – 70	27 – 52	30 – 65	10 – 45	15 – 40	15-40
# 200 (0.075 mm) (In Sand Portion)*	0 – 12	0 – 12	0 – 12	---	---	---	---
# 200 (0.075 mm) (In Total Sample)	---	---	---	0 – 10	0 – 5	0 – 5	0-5

* Fraction passing the # 4 (4.75 mm) sieve

Please Note – This Supplemental Specification replaces the entire Division 400**DIVISION 400 - PAVEMENTS****SECTION 401 -- PLANT MIX PAVEMENTS – GENERAL****Description**

1.1 These specifications include general requirements that are applicable to all types of plant mix asphalt pavements irrespective of the gradation of aggregate, kind and amount of asphalt binder, or pavement use. Deviations from these general requirements will be indicated in the specific requirements for each type.

1.2 These specifications provide for the use of recycled asphalt shingle products, as identified on the NHDOT Qualified Products List and reclaimed asphalt pavement material in certain specified mixtures.

1.3 This work shall consist of the construction of one or more courses of asphalt pavement constructed on a prepared foundation in accordance with these specifications and the specific requirements of the type under contract. The work shall be in reasonably close conformance with the lines, grades, thickness, and typical cross-sections shown on the plans, within the tolerances specified or established by the Engineer.

1.4 These specification provide for both method and quality assurance specification work. Sections under the heading Quality Assurance are applicable on QC/QA items only. Sections marked Method are applicable for non-QC/QA items and those portions of QC/QA items that are not measured for pay adjustment. All sections under the heading General are for use with all items.

1.5 Quality Assurance

1.5.1 The work will be accepted under Quality Assurance (QA) provisions in accordance with these Specifications and the applicable requirements of 106.

(a) The QC/QA Tier 1 item is to be used on specified projects that are on new locations, interstate projects, full depth reconstruction projects in rural areas or on reclamation projects in rural areas.

(b) The QC/QA Tier 2 item is to be used on specified projects that are inlay type projects, full depth reconstruction projects with maintenance of traffic phasing, projects with intersecting streets, projects with pavement tapers, bridge projects with short approach paving, projects where there are many manhole/drainage structures or driveways (generally in urban and suburban areas).

QUALITY/PAY FACTORS TO BE ASSESSED

	Tier 1	Tier 2
Asphalt Content and Gradation	X	X
Cross Slope	X	
Density	X	X
Ride Quality	X	
Thickness	X	

Materials

2.1 Aggregates - General

2.1.1 Aggregates shall be uniform quality durable pebbles or fragments of rock, with or without sand or other inert finely divided mineral aggregate. All material shall be free from clay balls, organic matter, deleterious substances, and an excess of flat or elongated pieces as specified in ASTM D 4791. Washing will not be required, except when aggregate plants do not produce clean material by the dry process method. In order to obtain uniformity of color and appearance of the pavement throughout the project, the aggregate for all the wearing courses shall be obtained from the same material source. Sufficient material shall be on hand prior to starting daily operations to ensure uninterrupted processing for the working day.

2.1.2 Fine aggregate shall consist of sound durable particles of sand, crushed stone, or a combination thereof. Fine aggregate shall be free from clay balls and injurious amounts of organic matter. Stone screening shall be produced from stone at least equal in quality to that specified for coarse aggregate.

2.1.2.1 Fine aggregate may be 100 percent manufactured aggregate.

2.1.3 Mineral filler shall conform to AASHTO M 17 except that 100 percent shall pass the No 16 (1.18 mm) sieve, waiving the requirement for the No. 30 (0.600 mm) sieve.

2.1.4 Coarse aggregate shall be crushed stone or crushed gravel and shall have a percentage of wear as determined by AASHTO T 96 of not more than 45 percent unless otherwise specified by contract item. In each stockpile, not less than 50 percent by weight of the particles retained on the No. 4 (4.75 mm) sieve shall have at least one fractured face. Stockpiles consisting of a blend of crushed stone and crushed gravel will be permitted so long as the overall consistency of the stockpile is reasonably maintained and the lesser portion of coarse aggregate material does not exceed 10 percent of the total. This percentage shall be determined on the portion of the total sample by weight that is retained on the No. 4 (4.75 mm) laboratory sieve.

2.2 Bituminous Materials - General

2.2.1 Bituminous materials used for asphalt cement binder shall meet the properties specified in AASHTO M 320. The grade of asphalt cement binder to be used will be specified in a Special Provision contained in the Proposal.

2.2.2. Liquid binder samples shall be obtained by plant personnel in the presence of the Inspector/Technician. Samples shall be obtained during each days production.

2.2.3 Producers and suppliers of asphalt binders shall comply with the requirement of AASHTO R 26. Asphalt binder suppliers shall have a quality control plan approved by the Bureau of Materials and Research that complies with AASHTO R 26.

2.3 Approval of Materials - Method Requirements

2.3.1 At least five working days in advance of the date of starting operations, the Bureau of Materials & Research may request that representative samples of all materials proposed for use be submitted for testing.

74

2.4 Composition of Mixtures - General.

2.4.1 Hot mix asphalt shall be composed of a mixture of aggregate, filler if required, and asphalt binder. The several aggregate fractions shall be sized, uniformly graded, and combined in such proportions that the resulting mixture meets the grading requirements of the job mix formula. The contractor shall use the Volumetric Mix Design Method in AASHTO Standard Practice R 35 as modified herein.

2.4.2 The Contractor shall have the option of utilizing asphalt pavement removed under the contract, if any, or old asphalt pavement from an existing stockpile or supplying all new materials for the production of asphalt pavement or any combination of the foregoing. If the job mix formula uses recycled materials, the mix shall meet the requirements of Reclaimed Asphalt Pavement as specified in 2.9.

2.4.3 The Department allows the use of recycled binder in mix designs, up to 0.8% Total Reused Binder (TRB) without any change in asphalt binder requirements as long as the mix design meets all volumetric mix design criteria. When a design has been completed using the maximum allowable percentage of TRB, one point verifications may be performed using decreasing percentages of TRB. If the design is not validated using a decreased amount of TRB, a new design will be required.

2.5 Job Mix - General

2.5.1 When a new volumetric mix design is required, the Contractor shall use the Volumetric Mix Design Method in AASHTO Standard Practice R 35 to develop a mix that meets the associated design criteria. The Mix design shall follow the procedure detailed in AASHTO with the following exceptions: Amend Table 1 Superpave Gyrotory Compaction Effort to read as follows:

Design ESALs (Million)	N initial	N design	N max
0 < 10	6	50	75
≥10	7	75	115

Add the following:

Wearing course on ESAL designs of < 10 shall have a minimum binder content of 5.8% utilizing the 50 gyration N design mix

Wearing course on ESAL designs of > 10 shall have a minimum binder content of 5.5% utilizing the 75 gyration N design mix.

This required minimum asphalt content is based on the use of aggregate with a specific gravity of 2.65 to 2.70. The minimum asphalt content requirement may be adjusted when aggregate with a higher specific gravity is used.

Amend Table 3 in AASHTO M 323, referenced in AASHTO R 35, to read as follows:

75

Table 1 –Design Control Points *								
Standard Sieves	Nominal Maximum Aggregate Size							
	1 in (25 mm)		3/4 in (19 mm)		1/2 in (12.5 mm)		3/8 in (9.5 mm)	
	Max.	Min.	Max.	Min.	Max	Min.	Max.	Min.
In (mm)	Percentage by Weight Passing Criteria (Control Points)							
2 (50.0)								
1-1/2 (37.5)		100.0						
1 (25.0)	100.0	90.0		100.0				
3/4 (19.0)	90.0		100.0	90.0		100.0		
1/2 (12.5)			90.0		100.0	90.0		100.0
3/8 (9.5)					90.0		100.0	90.0
No. 4 (4.75)							90.0	
No. 8 (2.36)	45.0	19.0	42.0	32.0	52.0	42.0	56.0	46.0
No. 200 (0.075)	7.0	1.0	8.0	2.0	10.0	2.0	10.0	2.0

All mix designs shall be submitted to the Department for verification and approval.

* Superpave designs will be accepted through the restricted zone, pending verification and approval by the Bureau of Materials & Research. The contractor shall submit compaction data from trial blends at the optimum asphalt content and at 0.5% below and above the optimum asphalt content. The data shall include the temperature at which the HMA was aged.

2.5.2 The Design Information Shall Include:

- (a) Asphalt Binder
PG Test Data
- (b) Specific Gravity
Laboratory Mix/Compaction Temperature
- (c) Aggregate
- (d) Dry and Washed Gradation
- (e) Bulk and Apparent Specific Gravity
All appropriate consensus properties
- (f) Blends
Baghouse material from the plant shall be incorporated into the mix design. The amount of baghouse material should be based on estimated usage or experience.
- (g) Moisture susceptibility according to AASHTO T 283.

Along with the design information, Materials & Research (M&R) requires 2 quarts of the designated asphalt binder, 4 preblended aggregate specimens for gyratory and 2 preblended aggregate specimens, suitable for AASHTO T-209 when mixed with the appropriate asphalt, in order to verify the design. M&R will accept the mix design based on the submitted information meeting the mix requirements and on verification of the mix volumetrics of the submitted specimen. If the verification samples indicated voids between 3.0 and 5.5 percent, and the Voids in Mineral Aggregate (VMA) and Voids Filled with Asphalt (VFA) fall within the specified limits, then the design will be accepted. Once accepted, the approved mix design is the job mix formula (JMF). If the voids are outside the aforementioned range or the VMA or VFA are outside the specified limits, the design will be rejected. M&R may elect to verify the design again.

76

2.5.3 The proposed mix designs and materials shall be submitted to the Engineer a minimum of 20 working days before placement for approval. It shall be the responsibility of the contractor to ensure all approved mix designs have been entered into the plant automation system before production begins. The contractor will also be required to post a copy of the JMF in the DOT testing laboratory.

2.5.4 Whenever the aggregate properties change enough to negate the project's existing design, a new design shall be submitted.

2.5.5 If it becomes necessary to change the asphalt binder grade or the source of aggregate, a new mix design shall be developed. Up to 14 calendar days will be required to evaluate a change. Approved changes in target values will not be applied retroactively for acceptance or payment. If it becomes necessary to change the source of asphalt binder, the Contractor must submit recent quality test results from the manufacturer for the asphalt binder including a temperature viscosity curve.

2.5.6 The Contractor shall perform a single point verification of an existing project mix design at the beginning of a new construction season to determine if the design remains valid. If the design is validated, the data from the single point verification shall be submitted to the Department. If the design cannot be validated, a new design shall be developed.

2.5.7 The Bureau of Materials and Research may require the use of certain chemical additives.

2.5.8 The laboratory performing the design shall be approved by the Department. To obtain the Department's approval, a laboratory must demonstrate that they are equipped, staffed, and managed so as to be able to produce job mix formulas and test hot asphalt mix in accordance with these Specifications. Approval for each laboratory shall remain in effect for a period of one year.

2.6 Method Requirements

2.6.1 Stockpiled coarse aggregate shall meet the requirements of Table 2.

Table 2 -- Percent Passing				
Sieve Size	1-1/2 inch (37.5 mm)	3/4 inch (19 mm)	1/2 inch (12.5 mm)	3/8 inch (9.5 mm)
1-1/2 inch (37.5 mm)	100			
1-1/4 inch (31.5 mm)	90.0 - 100			
1 inch (25.0 mm)	50.0 - 85.0	100		
3/4 inch (19.0 mm)	10.0 - 50.0	90.0 - 100	100	
1/2 inch (12.5 mm)		15.0 - 55.0	90.0 - 100	100
3/8 inch (9.5 mm)			20.0 - 60.0	95.0 - 100
# 4 (4.75 mm)				22.0 - 55.0
No. 8 (2.36 mm)	0 - 5.0	0 - 5.0	0 - 10.0	0 - 10.0

2.6.2 After the job mix formula is established, all mixtures furnished for the project shall conform within the following ranges of tolerances:

Passing No. 4 (4.75 mm) and larger sieves	±7.0 percent
Passing No. 8 (2.36 mm) to No. 100 (0.150 mm) sieves (inclusive)	±4.0 percent
Passing No. 200 (0.075 mm) sieve	±1.0 percent
Asphalt binder	±0.4 percent
Temperature of mixture	± 20 °F (11 °C)

2.6.3 When unsatisfactory results or other conditions make it necessary, it shall be the responsibility of the contractor to make all adjustments required to ensure the mix conforms to the JMF. Contractor quality control personnel will not be required to be on site during production of non-QC projects, but contact information shall be posted in the testing lab in the event problems arise. If two consecutive unsatisfactory results occur, the Engineer may stop production until satisfactory corrective action has been taken.

2.7 Quality Assurance

2.7.1 After any new changed job mix formula is established, all mixtures furnished for the project shall conform thereto, within the gradation and asphalt binder content reject limits in Table 6 in 3.19.1.1. Specification limits for pay adjustments under quality assurance provisions shall be as set forth in Table 5 in 3.19.1.1.

2.7.2 The general composition limits given in Table 1 in 411 indicate target value ranges of mixtures permissible under 411. The job mix formula shall lie within the target value ranges indicated for the particular type of hot asphalt mix.

2.8 General - Bridge pavement base course shall be 3/8 in.(9.5 mm) wearing course.

2.9 General - Non-modified asphalt cement shall contain silicone additive with the concentration being 3 parts per million plus or minus 1 part per million of silicone to asphalt cement, unless otherwise directed. Silicone additive shall be in liquid form and have a viscosity of 1,000 centipoises (1 Pas) at 77 °F (25 °C). Asphalt cement containing silicone shall meet the requirements of 401.2.2

2.10 Recycled Materials - General

2.10.1 Reclaimed asphalt pavement (RAP) and recycled asphalt shingle (RAS) products may be used individually or in combination in the production of hot mix asphalt. The allowed dust to asphalt ratio shall be as identified in AASHTO M 323. The maximum allowable total reused "asphalt" binder (TRB) in HMA mixes shall be as indicated below. The allowed RAP percentage shall be reduced proportionally, based on asphalt cement content, if RAS products are also used. Any changes in the combination of recycled materials shall require a new mix design unless otherwise approved by the Bureau of Materials & Research.

2.10.2 Reclaimed Asphalt Pavement (RAP). RAP shall consist of recycled asphalt pavement and shall be processed by crushing, cold milling, or other approved sizing techniques approved by the Bureau of Materials and Research to meet the required gradation specifications. The mixture of RAP and new aggregate shall meet the requirements specified in Table 1 for aggregate gradation. The RAP shall be tested every 1,000 tons for gradation and asphalt binder content as a stockpile is being built. These test results shall remain on file by the contractor until such time as the entire RAP stockpile has been utilized.

2.10.2.1 The PG grade of added asphalt shall be as specified by the Bureau of Materials and Research. The aggregate component of the RAP shall meet the requirements of Section 401.2.1. The bitumen component of the RAP shall be asphalt cement and shall be free of significant contents of solvents, tars, and other volatile organic compounds or foreign substances that will make the RAP unacceptable for recycling as determined by the Bureau of Materials and Research.

2.10.2.2 RAP and RAS materials may be rejected if deemed unsuitable for any reason or require an increase or decrease in the mix asphalt content. The Contractor shall submit representative samples, and gradation and asphalt cement content test results of the RAP to be incorporated into the Recycled Mixture for approval by the Bureau of Materials and Research at least 30 calendar days prior to the start of paving.

2.10.3 Recycled Asphalt Shingle (RAS) Products. RAS products shall consist of asphalt shingle products resulting from a process approved by the Department and identified on the NHDOT Qualified Products List. Effective virgin asphalt replacement from RAS products will be determined by Materials and Research. All gradation specifications of Table 1 shall be maintained for HMA produced with addition of RAS products.

2.10.3.1 The RAS products shall be tested every 500 tons for gradation and asphalt binder content as a stockpile is being built. These test results shall remain on file by the contractor until such time as the entire RAS product stockpile has been utilized. The Contractor shall submit representative samples, and gradation and asphalt cement content test results of the RAS product to be incorporated into the Recycled Mixture for approval by the Bureau of Materials and Research at least 30 calendar days prior to the start of paving.

2.10.4 For all designs containing TRB in an amount greater than 1% of the total binder:

- (a) RAP stockpiles shall be covered by a roof. RAS product shall be kept dry.
- (b) Prior to the start of production, the RAP and RAS product binder(s) shall be tested by the Contractor to determine the appropriate grade of virgin binder to be added. Composite binder PG grade compliance shall be verified for mixes containing RAS product prior to their use.
- (c) When RAS product is included, a split sample of the mix will be taken from the delivery truck at the start of production, and every 10,000 tons thereafter for testing. The asphalt binder will be recovered from the mixture utilizing the AASHTO T 170 test method. Recovered asphalt binder will be tested in accordance with AASHTO M 320 Table 1 and NHDOT B-8 for compliance with specifications.

TRB MIX DESIGN CRITERIA

Maximum Allowable TRB

Max. % RAP	Max. %RAS Product	Max. Combined % TRB
Asphalt Binder 0.8	Asphalt Binder 0.6	0-0.8

Application Requirements

- | | | | |
|-----|-----|------------|--|
| | | | <ul style="list-style-type: none"> a. RAP – only combinations: Virgin binder grade shall be as specified. b. Mixes containing RAS product: Composite binder shall meet the specified PG grade. Compliance of design shall be verified by split sample testing. c. Test RAP & RAS product for gradation & AC% every 1,000 & 500 tons respectively. |
| 1.0 | 0.6 | >0.8 – 1.0 | <ul style="list-style-type: none"> a. RAP-only combinations, reduce specified virgin binder PG grade by one grade unless determined to not be required. b. Mixes containing RAS product: Composite binder shall meet the specified PG grade. Compliance of design shall be verified by split sample testing. c. Test RAP & RAS product for gradation & AC% every 1,000 & 500 tons respectively. |
| 1.5 | 0.6 | >1.0 – 1.5 | <ul style="list-style-type: none"> a. Composite binder shall meet the specified PG grade. Compliance of design shall be verified by split sample testing. b. Cover RAP stockpiles. c. Only allowed in a drum mixer. d. Only allowed for binder & base courses. e. Test RAP & RAS product for gradation & AC% every 1,00- & 500 tons respectively. f. Run split samples at start of production, and every 10k tons thereafter for composite binder testing. |

2.11. Asphalt Modifiers - General The generic type of each asphalt binder admixture and/or additive shall be identified on the certificate of analysis which will be furnished by the manufacturer for each load of asphalt delivered.

2.12 Pavement Joint Adhesive. Pavement Joint Adhesive, Item 403.6, shall be a product that is listed on the Department's Qualified Products List.

Construction Requirements

3.1 Mixing Plants

3.1.1 General.

- Course aggregates shall be furnished in at least two nominal sizes for mix types containing top size aggregates of 1/2 in (12.5 mm) and larger.

80

- RAP shall be fed into the plant by equipment specifically designed for recycling and approved by the Bureau of Materials and Research. In addition, all requirements pertaining to aggregates shall apply to RAP. Scalping screens, grizzlies, or similar devices shall be installed on the RAP feed bin(s) to remove any debris or other foreign materials in excess of 2" (50mm). If a drum mix plant is used, the RAP shall be fed into the drum so that it will not come in direct contact with the burner flame. Mixing of RAP with the new aggregate shall occur before the bituminous material introduction point. The final mix produced shall be visually free from any chunks of RAP.
- Plants shall be approved at least five days prior to operations and will be capable of maintaining an adequate supply of mixture to the project.

3.1.2 Method Requirements.

- The site shall have ample storage space for the required separate bins, stalls, or stockpiles to allow delivery of uncontaminated sized aggregates to the feeder. To prevent spillage from one pile or bin to the next, aggregate assigned to different stockpiles shall be separated by bulkheads or other satisfactory means.
- Stockpiles of coarse aggregate produced for use in drum mix plants having top size aggregates greater than 3/4 in (19 mm) shall be constructed in layers not to exceed 4 ft (1.2 m).
- All blending of aggregates shall be accomplished through separate bins at the cold elevator feeders and not in stockpiles.
- The plant shall be provided with a dust collector or collectors, designed to waste or return uniformly to the hot elevator all or part of the material collected, as directed. All plants shall have adequate covers and housing as may be necessary to ensure the proper collection of dust and the general cleanliness of the plant operation. The Contractor shall comply with all State and Federal environmental regulations.

3.1.3 Quality Assurance.

- Mixing plants shall conform to AASHTO M 156. An efficient dust collecting system shall be provided to prevent the loss of fine material. The material collected may be returned to the mixture at a uniform rate or discarded.

3.1.4 Safety Requirements for Inspection - General

3.1.4.1 Adequate and safe stairways to the mixer platform shall be provided, and guarded ladders to other plant units shall be located where required for accessibility to plant operations.

3.1.4.2 All gears, pulleys, chains, sprockets, and other dangerous moving parts shall be thoroughly guarded and protected.

3.1.4.3 Ample and unobstructed space shall be provided on the mixing platform. The plant operator shall have a clear and unobstructed view of the plant operations.

3.1.4.4 A platform shall be located in close proximity to the inspector's laboratory for the purpose of easily obtaining samples of the mixture from the trucks.

3.1.4.5 When the plant is to be operated in other than daylight hours, adequate lighting shall be provided in all areas frequented by the inspector during his normal routine. Specific areas to be illuminated

include the truck loading zone and sampling location. A light or lights shall also be located so as to allow the clear observance of the truck body lubrication operation.

3.1.5 Scheduling Inspection Personnel - General

3.1.5.1 The Contractor shall notify the Bureau of Materials and Research at least three working days in advance of starting paving operations to allow sufficient time to schedule required plant inspection personnel. When paving bridge decks that have barrier membranes, this notice shall include the name of the membrane product so that the mix temperature may be established.

3.1.6 Access to Production Facilities - General

3.1.6.1 The Engineer shall have access at any time to all parts of the plant for inspection of the conditions and operations of the plant, for confirmation of the adequacy of the equipment in use, for verification of proportions and character of materials, and for determination of temperatures being maintained in the preparation of the mixtures. The Contractors shall provide a suitable building, room, or trailer for exclusive use by the DOT Technician as a testing laboratory in which to house and use the testing equipment. Laboratories shall be in an approved location, with one laboratory provided for each plant.

3.1.7 Field Laboratories – General

3.1.7.1 Field laboratories shall meet the following minimum requirements:

Outside Dimensions:	<u>Method Requirements:</u> 16 ft long by 8 ft high [or equal] by 7 ft high (4.8 m long by 2.4 m wide by 2.1 m high). <u>Performance Requirements (QC/QA):</u> Laboratory shall consist of a minimum of 200 ft ² (18.5 m ²) of floor space, laid out to accommodate shelves, benches, desk, equipment and personnel movement.
Windows:	Two, with locks and screens, providing cross ventilation.
Doors:	One, with lock and screen.
Electrical:	Adequate lighting and power outlets.
Air Conditioner:	Unit size shall be as recommended for size of the facility.
Heat:	Thermostatically controlled to maintain a minimum temperature of 68°F (20°C).
Weatherproofing:	Roof, sides, and floor shall be maintained weatherproof at all times.
Appurtenances:	(a) An exhaust fan and hood over the extractor. The hood shall be large enough to cover the extractor. The fan shall be a high-volume axial-flow fan, at least 10 in (250 mm) in diameter, and of sufficient capacity to adequately vent the fumes. (b) Free wall space of at least 12 ft ² (1.3 m ²); or a bulletin board of equal area for posting notices and job mix formulas. <u>Method Requirements:</u> Suitable shelves and benches. One bench shall be approximately 24 in wide by 36 in high and at least 10 ft long (600 mm wide by 900 mm high and at least 3m long). The bench may extend the length of the building.) <u>Quality Assurance (QC/QA):</u> Suitable shelves and benches. Bench space shall be approximately 24 in. (600 mm) wide by 36 in. (900 mm) high. There shall be a minimum total length of 19.0 ft (6 m) of bench space.

3.1.7.2 The following office furnishings and testing equipment shall be provided:

- (a) Electronic balance with tray, at least 300 oz (9000 gram) net capacity, sensitive to 0.003 oz (0.1 gram).
- (b) Desk and chair in good working condition.
- (c) Set of U.S. Standard brass sieves, each sieve being 12 in (300 mm) in diameter and 1- 1/2 in (37.5 mm) high. The set shall consist of one each of the following sizes: 1- 1/2 in, 1-1/4 in, 1 in, 3/4 in, 1/2 in, 3/8 in, No. 4, No. 8, No. 16, No. 30, No. 50, No. 100, No. 200, (37.5 mm, 31.5 mm, 25.0 mm, 19.0 mm, 12.5 mm, 9.5 mm, 4.75 mm, 2.36 mm, 1.18 mm, 600 mm, .300 mm, .150 mm, .075 mm, with pan and cover.
- (d) Motor driven shaker for 12 in (300 mm) diameter sieves. Shaker shall meet the following requirements: Rotating turntable, tilt to 45 degree angle and have hammers to tap each sieve during operation.
- (e) Motor driven centrifuge extractor, 100 oz (3000 gram) capacity with variable speed up to 3600 rpm, with filter rings and non-toxic solvent approved by the Bureau of Materials and Research.
- (f) Tachometer readily available to check the speed of the extractor.
- (g) Automatic timer with interval of 0 to 30 minutes.
- (h) Bristle brush for cleaning No. 200 (0.075 mm) sieve.
- (i) Brass brush for cleaning 8 in (200 mm) diameter sieves.
- (j) Five pans or bowls, approximately 4 in (100 mm) high, 15 in (375 mm) round or square.
- (k) Spatula, large spoon, garden trowel, measuring scoop, and 1 quart (1 L) pitcher.
- (l) Fire extinguisher, minimum five pound (2.3 kg) dry chemical.
- (m) Desk brush and floor broom.
- (n) Sample splitter (riffle type), chute width 1- 1/2 to 2 in (38 to 50 mm).
- (o) Microwave oven when drum mix plant is used.
- (p) Minimum of one metal sample pail for each hot bin.
- (q) Lavatory with toilet (See 698.2.2.4) and wash basin, unless approved otherwise.
- (r) Water, hot and cold, and water suitable for drinking. (Fountain style will be acceptable).
- (s) Telephone with private line.
- (t) Drying oven, minimum of 3.5 ft³ (0.10 m³).*
- (u) Equipment sufficient to perform AASHTO T 209.*
- (v) Water cooled diamond saw capable of cutting 6 in (150 mm) road cores.
- (w) High Speed Internet Connection - Each laboratory (on State-bid projects) will be provided with bi-directional Internet access having a minimum data rate of 256K bps.
- (x) Wheelbarrow when a drum mix plant is used.

*All ovens other than microwaves shall be vented to the outside.

3.1.7.3 All of the foregoing testing equipment shall be in good condition and shall be replaced or repaired by the Contractor if, during the duration of the project, it becomes unsuitable for testing purposes. Testing equipment shall be calibrated by the Contractor in accordance with 106.03. The above mentioned equipment is for operation of a single plant.

3.2 Storage of Asphalt Binder – General

3.2.1 Tanks for storage of asphalt binder shall be of minimum 10,000 gal (38,000 L) capacity and equipped for heating the material under effective and positive control at all times, to the temperature

requirements set forth in the specifications for the paving mixture. Heating shall be accomplished by steam or oil coils, electricity, or other means such that no flame shall come in contact with the heating tank.

3.2.2 A complete system providing for continuous circulation of the asphalt binder between the storage tank and the proportioning units shall be employed. The discharge end of the circulating pipe shall be maintained below the surface of the asphalt binder in the storage tank to prevent discharging the hot asphalt binder into the open air.

3.2.3 The Contractor shall provide in the asphalt binder feed lines connecting the plant storage tanks to the asphalt binder weighting system or spray bar a sampling outlet consisting of a valve installed in such a manner that samples may be withdrawn from the line slowly at any time during plant operation. The sampling outlet shall be installed between the pump and the return discharge line in such a location that it is readily accessible and free from obstruction. A drainage receptacle shall be provided for flushing the outlet prior to sampling.

3.3 Control of Asphalt Binder - General

3.3.1 Satisfactory means either by weighing or metering shall be provided to obtain the proper amount of bituminous material in the mix within the tolerance specified. Means shall be provided for checking the quantity or rate of flow of bituminous material into the mixer as follows:

- (a) Metering devices for asphalt binder shall indicate accurately to within 1.0 percent the amount of asphalt binder delivered. The section of the asphalt binder flow line between the charging valve and the spray bar shall be provided with a three-way valve and outlet whereby the quantity delivered by the meter may be checked by actual weight. The valve controlling the flow of asphalt binder to the mixer shall close tightly to prevent asphalt binder from leaking into the pug mill during the mixing cycle. The meter shall be constructed so that it may be locked at any dial setting to 0.1 gal (0.4 L) and will automatically reset to this reading after the addition of asphalt binder to each batch. The dial shall be in full view of the mixer operator. The size and spacing of the spray bar openings shall provide a uniform application of asphalt binder the full length of the mixer in a thin uniform sheet or in multiple sprays.
- (b) If a bucket is used for weighing the asphalt binder, the bucket shall be of sufficient capacity to hold and weigh the amount required for a batch in a single weighing. The filling system and bucket shall be of such design, size, and shape that asphalt binder will not overflow, splash, or spill outside the confines of the bucket during filling and weighing. The filling system and bucket shall be so arranged as to deliver the asphalt binder in a thin uniform sheet or in multiple sprays over the full length of the mixer. The time required to add the asphalt binder shall be not more than 15 seconds.
- (c) Asphalt binder scales shall conform to the requirements for aggregate scales as specified in 3.1.6.7. Beam type scales shall be equipped with a tare beam or adequate counter-balance for balancing the bucket and compensating periodically for the accumulation of asphalt binder on the bucket.

3.3.2 Suitable means shall be provided, either by steam or oil jacketing or insulation, for maintaining the specified temperatures of the asphalt binder in the pipelines, meters, weigh buckets, spray bars, and other containers or flow line.

3.4 Batching Plants – General

3.4.1 All aggregate shall be delivered by belt driven feeders. All feeders shall provide for adjustment of the cold feed and shall be capable of being secured in any position.

3.4.2 Dryers shall continuously agitate the aggregate during the heating and drying process without leaving any visible unburned oily residue on the aggregate when it is discharged from the dryer. If unusually wet aggregate is being used, the input to the dryer shall be reduced to that amount which the dryer is capable of drying. Aggregates shall be free from coatings of dust after drying.

3.4.3 Plant screens shall be constructed and operated in such manner that all aggregates will be uniformly separated into the sizes required for proportioning. They shall have sufficient capacity to furnish the necessary quantity of each aggregate size required for continuous operation. Screen cloth that has become broken or has worn sufficiently to affect the gradation shall be replaced.

3.4.4 Thermometric equipment shall be provided as follows:

(a) An armored thermometer of suitable range shall be fixed in the asphalt binder feed line at a suitable location near the discharge at the mixer unit.

(b) The plant shall be further equipped with an approved thermometer, pyrometer, or other approved thermometric instrument that continuously indicates the temperature of the heated aggregate at the discharge chute of the dryer.

3.4.5 Hot bins shall consist of at least four separate aggregate compartments. One compartment shall be reserved for fine aggregate, and when required, one additional compartment shall be added for dry storage of mineral filler. Alternate bin systems may be utilized with prior approval from the Department. Provision shall be made for accurate proportioning. Each compartment shall contain the following features:

(a) Sufficient volume to supply the mixer at full rated capacity.

(b) An overflow pipe that shall be of such size and at such a location as to prevent any backing up of material into other bins or into contact with the screen. Overflow apparatus shall be equipped with a telltale device that alerts the operator and the inspector when the overflow equipment is full.

(c) Adequate telltale devices to indicate the position of the aggregate in the bins at the lower quarter points.

(d) Gates that cut off quickly and completely with no leakage.

(e) Adequate and convenient facilities including safe platforms for obtaining representative samples from each bin.

3.4.6 Weigh boxes shall be of sufficient size to hold the maximum required weight of aggregate for one batch without hand raking or running over. The weigh box shall be supported on fulcrums and knife edges so constructed that they remain in alignment or adjustment. All parts of the weigh box shall be free from contact with any supporting rods, columns, or other equipment that affects the proper functioning of the hopper or scale. Gates on both bins and weigh hopper shall be constructed to prevent leakage when closed.

3.4.7 Aggregate scales for any weigh box or hopper shall be of standard make and design and shall be accurate to 0.5 percent of the indicated load. The weight shall be indicated on a digital display. Scales shall be substantially constructed and shall be installed in such a manner as to be free from vibration. The

85

display shall be in full view of the operator, and the numerals shall be of such a size that they can be easily read by the inspector. If the digital display is so located that it is not easily accessible to the inspector, a duplicate display will be required for exclusive viewing by the inspector. The job mix formula target weights shall continuously be part of the digital display during plant operations. The digital scale weight indications shall be displayed adjacent (in juxtaposition) to each target weight for easy comparison to the job mix formula. It shall be the responsibility of the Contractor to ensure that all scales are tested and sealed according to provisions as shown in the National Institute of Standards and Technology Handbook 44, at least on an annual basis. The work shall be accomplished by a competent commercial scale company prior to the start of the construction season. Scales shall be re-tested prior to use, after they have been moved. The Contractor shall have readily available at least ten standard 50 lb (eleven standard 20 kg, one standard 5 kg, and two standard 1 kg) weights, for checking the scales during operations.

3.4.8 The batch mixer shall be of an approved pug mill type, hot oil or steam jacketed, or heated by other approved means and capable of producing uniform mixtures within the specified tolerances. The mixer shall have a batch capacity of not less than 4,000 lb (1,800 kg) and be constructed so as to prevent leakage during the mixing cycle. The amount of material that may be mixed per batch shall not exceed the manufacturer's rated capacity. If the mixer does not mix properly at the rated capacity, or if its production does not coordinate with the other plant units, the Department reserves the right to reduce the size of the batch until the desired efficiency is obtained. The pug mill shall be equipped with a sufficient number of paddles operated at such speed as to produce a properly and uniformly mixed batch. If, in the course of mixing, two adjacent paddle tips become broken, immediate repair will be called for. If the paddle tips become broken at widely separated points, repair may be delayed until the end of the working day. The clearance of the tips from all fixed and moving parts shall not exceed 3/4 in (19 mm). Badly worn or defective tips shall not be used in mixing operations. The mixer shall be covered to prevent loss of fine material. The discharge gate shall be so designed that no uncoated material is retained at the gate opening during the mixing operation. Leakage from the pug mill gate during operation will not be permitted.

3.4.9 Each plant shall be equipped with an accurate time lock to control the operations of a complete mixing cycle. A mixing cycle shall consist of two periods, the dry mixing period and the wet mixing period. The dry mixing period shall be the interval of time between the opening of the aggregate weigh hopper gate and the start of the application of asphalt binder. The wet mixing period shall be the interval of time between the start of the application of asphalt binder and the opening of the mixer gate. The time lock shall be capable of being set at the intervals of five seconds or less throughout the mixing cycle and shall have a suitable case equipped with an approved lock. The setting of time intervals shall be performed in the presence and under the direction of the Engineer who may lock the case until such time as a change is to be made in timing periods. The time lock shall lock the asphalt binder bucket throughout the dry mixing period and shall lock the mixer gate throughout the dry and wet mixing period.

3.4.10 The use of a fully automatic batching plant will be required and shall meet the following requirements:

- (a) The automatic proportioning controls shall include equipment for accurately proportioning batches of the various components of the mixture by weight in the specified sequence and for controlling and timing the mixing operation. Interlocks shall be provided that delay, stop, or lock out the automatic batch cycling whenever the batched quantity of any component weight or the total batch is not within the specified weight tolerance, or when there is a malfunction in any portion of the control system.

- (b) The automatic control for each batching scale system shall be equipped with a device for stopping the automatic cycle in the underweight check position and in the overweight check position for each material so that the tolerance setting may be checked.
- (c) Each dial scale system shall be equipped with a removable dial puller that can be attached to the dial lever system so that the dial can be moved smoothly and slowly through its range to check the settings of the automatic control system. The plant operator shall perform this automatic control system checkout procedure periodically as requested by the Engineer.
- (d) The weigh batching controls shall meet the following tolerances for the various components weighed in each batch:

Component Weighed	Percentage of Total Batch Weight
Tare weight of aggregate weigh box	±0.5
Tare weight of asphalt binder weigh bucket	±0.1
Each aggregate component	±1.5
Mineral filler	±0.5
Asphalt	±0.1

- (e) The total weight of the batch shall not vary by more than ±2.0 percent of the designated batch weight.
- (f) Recording equipment shall be provided in all plants employing automatic proportioning. Each recorder shall include an automatic printer system. The printer shall be positioned so that the scale reading and the printer can be readily observed from one location by the plant inspector. The printer shall produce, in digital form, a weight slip conforming to the requirements of 109.01 and 401.3.8.1.
- (g) If at anytime the automatic proportioning or recording system becomes inoperative, the plant will not be allowed to operate.

3.4.11 The aggregate shall be dried and heated to a minimum temperature of 260 °F (125 °C). The asphalt binder shall be heated to a temperature between 250° and 325°F (120° and 165°C). Each size of hot aggregate, the mineral filler if required, and the bituminous cement shall be measured separately and accurately to the proportions in which they are to be mixed. The mixture shall be made by charging the mixer with the hot aggregate, coarse sizes first, unless otherwise directed, which shall be dry mixed for 5 to 15 seconds. The asphalt binder shall be added and the mixing continued until a uniform coating is obtained and all particles of the aggregate are thoroughly coated. The total dry and wet cycle shall not be less than 35 seconds for base and binder mixtures and not less than 40 seconds for the wearing course. In no case shall the total mixing period exceed 75 seconds.

3.4.12 If the aggregate in the hot bins contains sufficient moisture to cause foaming in the mixture, such aggregate shall be removed from the bins, and production rate shall be reduced so as not to exceed the capacity of the dryer. Material having once gone through the mixing plant shall not be returned to the stockpiles.

3.5 Drum Mix Plants - General

3.5.1 The plant shall be specifically designed for the process and shall be capable of satisfactorily heating, drying, and uniformly mixing the bituminous material and aggregate in accordance with the job mix formula. The rate of flow through the drum shall be controlled in order that a homogeneous mixture is obtained with all particles uniformly coated. In no case shall the quantity of mix produced exceed the

manufacturer's rated capacity. If the percent of moisture in the mixture exceeds 1.0 percent by weight, the right is reserved to decrease the rate of production. The plant shall be equipped with automatic burner controls.

3.5.2 The cold bins shall be divided in at least five compartments and shall be designed to prevent the overflow of material from one bin to another. When reclaimed pavement is used, an additional bin designed for this purpose will be required. In event of an emergency this bin may be used to feed aggregate in an amount not to exceed 15% of material to complete the days production. Each cold bin shall be equipped with an orifice to feed the aggregate accurately and uniformly. The feeding orifice shall be adjustable, and indicators shall be provided to show the gate opening. An automatic plant shutoff device shall be provided to operate when any aggregate bin becomes empty or the flow from any bin gate becomes restricted. A vibrator or other suitable means may be required in order to ensure a uniform flow of materials. The order of aggregate feed onto the composite cold feed belt shall be from coarse to fine.

3.5.3 The total cold aggregate feed shall be weighed continuously by an approved belt scale. The weighing system shall register within +0.5 percent of the indicated load.

3.5.4 Proportioning controls for aggregate and asphalt binder shall be located at the panel that also controls the mixture and the temperature. The panel shall be equipped with automatic controls that shall display, in digital form, the percentages of asphalt binder, mineral filler if required, and each aggregate in the job mix formula. The panel shall also be equipped to raise and lower the production rate without having to reset the individual controls for each change in production rate. The controls shall maintain aggregate flow accuracy such that the total variation of all materials being drawn per interval of time shall not exceed an amount equal to 1.5 percent of the total weight of bituminous mixture per interval of time.

3.5.5 Provisions shall be made for introducing the moisture content of the total cold feed into the belt weighing system and correcting the wet aggregate weight to dry aggregate weight. The system shall be capable of adjusting the flow of bituminous material to compensate for any variation in the dry weight of the aggregate flow. It shall be the responsibility of the Contractor to monitor and determine accurate moisture contents of the aggregate and RAP stockpiles used for production of hot mixed asphalt. Accurate moisture contents shall be determined at a minimum every other day of production. In the event of rain, moisture contents shall be determined for all aggregates and RAP to be utilized before the next day's production.

3.5.6 The dry weight of the aggregate flow shall be displayed by automatic digital readout in units of weight per interval of time.

3.5.7 When mineral filler is specified, a separate bin and feeder shall be provided with a variable drive interlocked with the aggregate feeders. Mineral filler shall be introduced and uniformly dispersed into the mixture without loss to the dust collection system. A device shall be provided to indicate when the flow of filler into the delivery system stops or its specified volume is out of job mix tolerance. The rate of flow shall be accurate to within 0.5 percent by weight, of the total mix. Means shall be provided to readily divert the flow of mineral filler into a container for measurement.

3.5.8 The asphalt binder shall be introduced through a continuously registering cumulative indicating meter by a pump specifically designed for the plant. The meter shall be located in the asphalt line so that it continuously registers the asphalt discharge to the mixer and so that the discharge through the meter can be readily diverted into a suitable container for measurement by actual weight. The meter shall indicate

accurately to within 1.0 percent the amount of asphalt binder being delivered. The accuracy of the pump and meter shall be verified at periodic intervals as designated by the Engineer.

3.5.9 Satisfactory means shall be provided to ensure positive interlock between dry weight of aggregate flow and the flow of bituminous material through an approved meter.

3.5.10 The flow of bituminous material shall be displayed by automatic digital readouts in terms of volume or intervals of weight and time.

3.5.11 The plant shall have a means of diverting mixes at start up and shut down or where mixing is not complete or uniform.

3.5.12 A surge or storage system complying with 3.7 shall be provided.

3.6 Mixing Temperature

3.6.1 Method Requirements

3.6.1.1 The Engineer may adjust the job mix formula temperature within the limits of 260° and 350°F (125° and 180°C) according to the existing conditions. Material with a temperature at discharge outside the job mix formula tolerance may be rejected. In no case will a mixture be accepted with a discharge temperature in excess of 375°F (190°C).

3.6.1.2 During hot weather, the temperature of the mixture when discharged shall be as low as is consistent with proper mixing and placing. During cold weather, a temperature approaching the upper limit is desirable

3.6.2 Quality Assurance

3.6.2.1 The job mix formula temperature may be adjusted within the limits of 260 °F (125 °C) and 350 °F (175 °C) according to the existing conditions. Material with a temperature at discharge outside the job mix formula tolerance may be rejected. In no case will a mixture be accepted with a discharge temperature in excess of 375 °F (190 °C).

3.7 Hot Storage System -- General

3.7.1 Material may be placed in a storage silo for a period not to exceed 24 hours from the time of mixing. The upper and lower gates when closed shall create an airtight seal. The silo shall be filled to capacity. 24 hour storage will not be allowed if there is reason to believe there is a problem with the gate seals or excessive heat loss.

3.7.2 The hot storage system shall be capable of conveying the hot mix from the plant to insulated and enclosed storage bins and storing the hot mix without appreciable loss in temperature, asphalt migration, segregation, or oxidation.

3.7.3 The conveyer system may be a continuous type or skip bucket type. If the continuous type is used, it shall be enclosed to prevent a drop in mix temperature. If the skip bucket type is used, the bucket must be of sufficient capacity to transport an entire batch and mass dump it into the bins.

3.7.4 The storage bins shall be designed in such a manner as to prevent segregation of the hot mix during discharge from the conveyor into the bins and shall be equipped with discharge gates that do not cause segregation of the hot mix while loading the mix into the trucks. The storage bin heating system shall be capable of maintaining the mix temperature without localized heating (hot spots).

3.7.5 The bin shall be equipped with a light or indicator to show when the level of material reaches the top of the discharge cone. The bin shall not be emptied below the top of the discharge cone until the use of the bin is completed each day. The material remaining in the discharge cone may be rejected if there is evidence of segregation.

3.8 Weighing and Hauling - General

3.8.1 The Contractor shall provide an approved automatic printer system that prints the weights of the material delivered, provided the system is used in conjunction with an approved automatic batching and mixing control system. Such weights shall be evidenced by a weight slip for each load.

3.8.2 Weight slips shall include requirements as shown in 109.01 and the following for batch plants with automatic proportioning equipment:

- (a) Tare weight of aggregate weigh box.
- (b) Tare weight of asphalt binder weigh bucket.
- (c) Accumulative weights as batched for each aggregate (total of last aggregate will be aggregate total).
- (d) Weight of asphalt binder.
- (e) Accumulated total weight of batch.

3.8.3 Each weight slip will show a consecutive load number and shall include an accumulative total of material delivered for each day.

3.9 Vehicles - General

3.9.1 The inside surfaces of vehicles may be lightly lubricated with a soap solution or non-petroleum release agent that will not be detrimental to the mix. Equipment that leaks oil, diesel fuel, gasoline, or any other substance detrimental to the pavement will not be allowed on the project.

3.9.2 The mixture shall be transported from the paving plant to the project in trucks having tight, smooth, metal beds previously cleaned of all foreign materials. Truck beds may be lined with a polyethylene type material designed and installed for hauling hot bituminous mixes. Each load shall be covered with canvas or other suitable material of sufficient size and thickness to retain heat and to protect it from weather conditions. The cover material when new shall weigh a minimum of 18 oz/yd² (0.6 kg/m²) and it shall be a tightly woven or solid material. When necessary, so that the mixture can be delivered on the project at the specified temperature, truck beds shall be insulated, and covers shall be securely fastened.

3.10 Placing - General

3.10.1 Prior to placing of any mix, a pre-paving conference shall be held to discuss and approve the paving schedule, source of mix, type and amount of equipment to be used, sequence of paving pattern, rate of mix supply, traffic control, and general continuity of the operation. Special attention shall be made to the

paving pattern sequence to minimize cold joints. The field supervisors of the above mentioned operations shall attend this meeting.

3.10.2 The Contractor shall notify the Engineer at least five working days in advance of paving operations to allow sufficient time to schedule required site inspection and testing. All paving and compaction equipment shall be approved and on site prior to start up each day.

3.10.3 Crack sealing material to be covered by a 1 in (25 mm) or less overlay shall cure a minimum of 45 days prior to the placement of bituminous pavement.

3.10.4 When performing paving operations at night, in addition to the requirements of 3.1.4.5, the Contractor shall provide sufficient lighting at the work site to ensure the same degree of accuracy in workmanship and conditions regarding safety as would be obtained in daylight.

3.10.5 Quality Assurance. The Contractor shall provide the following equipment for testing and sampling at the project site. The equipment shall be in good condition and shall be replaced by the Contractor if, during the duration of the project, it becomes unsuitable for testing or sampling purposes.

Metal plate 12 in (300 mm) minimum each side, flat bottom scoop 3000-gram capacity minimum, and sample containers to perform NHDOT B-7 sampling.

3.10.6 Weather limitations.

3.10.6.1 General. In special instances, when the Engineer determines that it is in the best interest of the State, the Engineer may waive the requirements of 3.10.6.

3.10.6.2 Any material delivered to the spreader having a temperature lower than 250°F (120°C) shall not be used.

3.10.6.3 Method Requirements. Mixtures shall be placed only when the underlying surface is dry, frost free, and the surface temperature is above 40°F (5°C) for courses greater than or equal to 1-1/4 in (32 mm) in compacted depth and above 50°F (10°C) for courses less than 1-1/4 in (32 mm) in compacted depth. The Engineer may permit, in case of sudden rain, the placing of mixture then in transit from the plant, if laid on a base free from pools of water, provided motorist visibility is not impaired and all other specifications are met. No load shall be sent out so late in the day that spreading and compaction cannot be completed during the daylight, unless the requirements of 3.10.4 are met. If rapid surface cooling of the laid down mix is occurring due to wind, the Engineer may suspend operations for the day. Wearing course shall not be scheduled for placement after October 1st of any year without written approval by the Engineer. If it is determined to be in the best interest of the Department to schedule placement after October 1st, the above specified weather and surface conditions shall remain in effect.

3.10.6.4 Quality Assurance. Mixtures shall be placed only when the underlying surface is dry and frost free. Paving shall be placed only as stipulated in the approved Quality Control Plan. The Engineer may permit, in case of sudden rain, the placing of mixture then in transit from the plant, if laid on a base free from pools of water, provided motorist visibility is not impaired and all other specifications are met. No load shall be sent out so late in the day that spreading and compaction cannot be completed during the daylight, unless the requirements of 3.10.4 are met. The Engineer may suspend operations for the day when the contractor is unable to meet specifications. Wearing course shall not be scheduled for placement after October 1st of any year without written approval by the Engineer. If it is determined to be in the best

interest of the State to schedule placement after October 1st, the above specified conditions shall remain in effect.

3.10.7 At the beginning and end of the project or project section, the existing pavement shall be removed to a sufficient depth to allow the placing of the new pavement and construction of a transverse joint, which shall be painted with a suitable bituminous material. The underlying course shall be clean and free from foreign materials and loose bituminous patches and must present a dry, unyielding surface.

3.10.8 Sweeping - General. Existing pavement or previously laid courses shall be thoroughly dry and free from all dust, dirt, and loose material. Sweeping with a power broom, supplemented by hand brooming, may be necessary.

3.10.9 Tack coat - General. Surfaces of any pavement course shall have a tack coat of emulsified asphalt applied in accordance with the requirements of 410.3.4.2 and 410.3.4.2.1.

3.10.10 General - Drainage and utility structures within the limits of the pavement shall be set and raised in accordance with the provisions of 604.3.4. Contact surfaces of the drainage and utility castings as ordered shall be painted with a thin coating of suitable bituminous material.

3.11 Pavers

3.11.1 Method Requirements

3.11.1.1 All courses shall be spread and finished to the required thickness by approved, self-contained, self-propelled spreading and finishing machines (pavers). Pavers shall be provided with an adjustable, activated screed and shall be capable of spreading the mixtures with a finish that is smooth, true to the required cross-section, uniform in density and texture, and free from hollows, tears, gouges, corrugations, and other irregularities. Broadcasting behind the paver shall be held to a minimum. Pavers shall be capable of spreading and finishing courses of the required thicknesses and lane widths. Horizontally oscillating strike-off assemblies will not be approved.

3.11.1.2 The activated screed shall be of the vibrating or tamping bar type or a combination of both and shall operate without tearing, shoving, or gouging the mixture. The activated portion of the screed shall extend the full width of the mixture being placed in the traveled way and other areas with sufficient width to accommodate a paver. In other locations as permitted such as narrow shoulders, tapers, and areas adjacent to curbs, non-activated extensions to the screed will be allowed. The paver shall be equipped with a screed heater. The screed heater shall be used when starting a cold machine and for maintaining a suitable screed temperature when needed.

3.11.1.3 Blaw Knox Pavers shall be equipped with the manufacturer's material management kit. The paving contractor shall certify that this work has been done before using any Blaw Knox paver.

3.11.1.4 The paver hopper gates shall be adjusted to pass the correct amount of mix to the spreading screws so that the screws operate more or less continuously. The height of material shall be maintained at a constant level in front of the screed, to a point where approximately half of the auger shall be visible at all times.

3.11.1.5 When required by the Engineer pavers shall be equipped with the following automatic screed controls for each paver:

1. Two 24 ft (7 m) ski type devices or floating beams.
2. Two grade sensors
3. Two short skis (joint matchers)
4. Slope sensing control for transverse slope.

The sensors for either or both sides of the paver shall be capable of sensing grade from an outside reference line or from the surface using a ski type device and shall be capable of sensing transverse slope of the screed. The sensors shall provide automatic signals that operate the screed to maintain the desired grade and transverse slope. Pavers shall not be used until the automatic controls have been checked and approved by the Engineer.

3.11.1.6 The use of automatic grade and slope controls shall be required on all pavers.

3.11.1.7 Whenever a breakdown or malfunction of the automatic controls occurs, the equipment may be operated manually for the remainder of the normal working day on which the breakdown or malfunction occurred. This method of operation must meet all other specifications.

3.11.1.8 On projects or parts of projects where the Engineer deems that the use of automatic controls are impracticable, some or all of the controls listed in 3.11.1.5 may be waived.

3.11.1.9 The forward speed of the paver shall be adjusted to the rate of the supply of materials so that the paver operates without having to make stops except for emergencies. If the Engineer determines that the paving operations result in excessive stopping of the paver, the Engineer may suspend all paving operations until the Contractor makes arrangements to synchronize the rate of paving with the rate of delivery of materials.

3.11.2 Quality Assurance

3.11.2.1 Pavers shall be:

- (a) Self-contained, power propelled units with adjustable vibratory screeds with full-width screw augers.
- (b) Heated for the full width of the screed.
- (c) Capable of spreading and finishing courses of hot asphalt mix in widths at least 12 inches (300 mm) more than the width of one lane.
- (d) Equipped with a receiving hopper having sufficient capacity to ensure a uniform spreading operation.
- (e) Equipped with automatic feed controls, which are properly adjusted to maintain a uniform depth of material ahead of the screed.
- (f) Capable of being operated at forward speeds consistent with satisfactory laying of the mix.
- (g) Capable of producing a finished surface of the required smoothness and texture without segregating, tearing, shoving, or gouging the mixture.
- (h) Equipped with automatic screed controls with sensors capable of sensing the transverse slope of the screed, and providing the automatic signals that operate the screed to maintain grade and transverse slope from a reference such as a grade wire or ski type device, either a floating beam with a minimum length of 30 ft (9 m) or sonic averaging with a minimum length of 24 ft (7 m).

3.11.3 General - When patching existing pavement, the material shall be placed on the prepared clean underlying surface at the locations designated and shall be spread to produce a smooth and uniform patch. The patch material shall be thoroughly compacted and shall match the line and grade of the adjacent pavement.

3.11.4 General - Relatively small areas not accessible to the paver may be spread by hand, but extreme care shall be taken to create a surface texture similar to the machine work. Surface material shall be spread by lutes and not by rakes.

3.11.5 General-Unless otherwise authorized, the final wearing course shall not be placed until guardrail posts have been set and general cleanup has been completed.

3.11.6 General - When hot bituminous bridge pavement is to be placed over barrier membrane, the placing temperature shall be as specified in 538.3.5. A paver, mounted on rubber tracks or tires, shall be used to place the 1 in (25 mm) base course unless this procedure is found to cause damage to the membrane. When such damage is found to be evident, the hand method may be allowed. The hand method may also be allowed if the Engineer determines that the use of a paver for this work is impracticable. During warm weather, the above paving shall be done during the cool period of the day. A paver shall be used to place the wearing course.

3.11.7 General- Where pavement is placed adjacent to structural members such as expansion joints, the material in the top course shall be placed so that the compacted grade of the pavement is 1/4 to 3/8 in (6 to 10 mm) above the grade of the structural member.

3.12 Compaction.

3.12.1 Method Requirements.

3.12.1.1 Immediately after the hot asphalt mix has been spread, struck off, and surface irregularities adjusted, it shall be thoroughly and uniformly compacted by rolling. The initial rolling shall be done with a static or vibratory steel-drum roller. Intermediate rolling shall be done by a pneumatic-tired roller. Final rolling shall be done with a static steel-drum roller or a roller of the steel-drum three-axle type, locked. The completed course shall be free from ridges, ruts, humps, depressions, objectionable marks, visible segregation, or irregularities and in conformance with the line, grade, and cross-section shown in the Plans or as established by the Engineer. Rollers must be in good mechanical condition, free from excessive backlash, faulty steering mechanism, or worn parts. The empty weight and the ballasted weight shall be properly marked on each roller. The minimum weight of static steel-drum rollers shall be 8 tons (7.3 metric tons). When a vibratory roller is being used, the vibration shall stop automatically when the roller is stopped or reversing direction of travel.

3.12.1.2 Pneumatic-tire rollers shall be self-propelled and shall be equipped with smooth tires of equal size and diameter. The wheels shall be so spaced that one pass of a two-axle roller accomplishes one complete coverage. The wheels shall not wobble and shall be equipped with pads that keep the tires wet. The rollers shall provide an operating weight of not less than 2,000 lb (900 kg) per wheel. All tires shall be maintained at a uniform pressure between 55 and 90 psi (380 and 620 kPa) with a 5 psi (35 kPa) tolerance between tires. A suitable tire pressure gauge shall be readily available.

3.12.1.3 Unless otherwise directed, rolling shall begin at the sides and proceed longitudinally parallel to the roadway center line, gradually progressing to the crown of the roadway. The overlap shall be

one-half the roller width for wheeled rollers and 6 in (150 mm) for vibrating rollers. No overlap is required for pneumatic-tired rollers. When paving in echelon or abutting a previously placed lane, the longitudinal joint shall be rolled first followed by the regular rolling procedure. On superelevated curves, the rolling shall begin at the low side and progress to the high side by overlapping of longitudinal passes parallel to the centerline.

3.12.1.4 Rollers shall move at a slow but uniform speed with the drive roll or drive wheels nearest the paver, except on steep grades. Static and pneumatic-tired rollers shall not operate at speeds in excess of 6 mph (10 km/h). All courses shall be rolled until all roller marks are eliminated, and a minimum density of 92% of maximum theoretical density as determined in accordance with AASHTO T 209 has been obtained. When ordered by the Engineer, cores shall be taken by the contractor and delivered to the technician at the plant laboratory for testing.

3.12.1.5 Any displacement occurring as a result of reversing the direction of a roller, or from other causes, shall be corrected at once by the use of lutes and the addition of fresh mixture when required. Care shall be exercised in rolling so as not to displace the line and grade of the edges of the bituminous mixture.

3.12.1.6 To prevent adhesion of the mixture to the rollers, the wheels shall be kept properly moistened with water or water mixed with very small quantities of detergent or other approved material. Excess liquid will not be permitted. All steel rollers shall be equipped with adjustable wheel scrapers.

3.12.1.7 Along forms, curbs, headers, and similar structures and other places not accessible to a normal full-sized roller, sidewalk rollers weighing at least 2,000 lb (900 kg) shall be used. Where rollers are impracticable, the mixture shall be thoroughly compacted with heated or lightly oiled hand tamps or vibrating plate compactors.

3.12.1.8 Unless the Engineer determines that for the weight and placement conditions a lesser number will be satisfactory to obtain the desired pavement densities, the following is the list of required compaction equipment. The output of each paver placing wearing course (Table 1) materials shall be compacted by the use of one each of the following complement of rollers as a minimum: a static or vibratory steel-wheel roller, a pneumatic-tired roller and a three-axle roller or a static steel-wheeled roller. If the required density is not being obtained with the rollers supplied, the use of additional rollers of the specified type may be ordered. Paving widths in excess of 16 ft (5 m) will require additional rollers as ordered.

3.12.2 Quality Assurance

3.12.2.1 Immediately after the hot asphalt mix has been spread, struck off, and surface irregularities adjusted, it shall be thoroughly and uniformly compacted. The completed course shall be free from ridges, ruts, humps, depressions, objectionable marks, visible segregation, or irregularities and in conformance with the line, grade, and cross-section shown in the Plans or as established by the Engineer. If necessary, the mix design may be altered to achieve desired results.

3.12.2.2 All compaction units shall be operated at the speed, within manufacturers recommended limits, that will produce the required compaction. The use of equipment, which results in excessive crushing of the aggregate will not be permitted. Any asphalt pavement that becomes loose, broken, contaminated, shows an excess or deficiency of asphalt binder, or is in any way defective, shall be removed and replaced at no additional cost with fresh hot asphalt mix, which shall be immediately compacted to

95

conform with the surrounding area. Hot asphalt mix shall not be permitted to adhere to the roller drums during rolling.

3.12.2.3 The type of rollers to be used and their relative position in the compaction sequence shall be the Contractor's option, provided specification densities are attained and with the following stipulations:

- (a) At least one roller shall be pneumatic-tired.
- (b) Vibratory rollers shall not be operated in the vibratory mode under the following conditions: When checking or cracking of the mat occurs, when fracturing of aggregate occurs, and on bridge decks.

3.13 Joints - General.

3.13.1 Unless otherwise shown on the plans, the longitudinal wearing course joints shall be at the edge of lane placed, where the edge line, lane line and centerline pavement markings will be applied, and joints of other courses shall be offset approximately 6 in (150 mm).

3.13.2 The material being placed next to a previously paved lane shall be tightly crowded against the face of the abutting lane. The paver shall be positioned so that during spreading, the material will overlap the edge of the first lane by 1 to 2 in (25 to 50 mm) and shall be left sufficiently high such that finish pavement of the lane being placed is approximately 1/8 inch (3 mm) higher than the previously paved lane after compaction. The overlapped material shall be rolled without luting. Longitudinal joint compaction shall be achieved by rolling from the hot side to within 6 inches (150 mm) of the previously placed mat. The next roller pass will overlap onto the previously placed paved lane by 6 inches (150 mm). Further compactive effort shall be applied to all joints during the intermediate and final rolling.

3.13.3 Placing of the course shall be as continuous as possible while complying with Contract Traffic Control Plans. Transverse joints will be allowed at the end of each work shift or as required to provide properly bonded longitudinal joints.

3.13.3.1 No longitudinal joints greater than 1 1/2 inch (37 mm) in height shall be left open to traffic unless a tapered overlapping ("wedge") joint is used. Centerline joints greater than 3/4 inch (19 mm) shall be properly delineated by tubular marker and signed appropriately. Joints between traveled way and shoulder greater than 3/4 inch (19 mm) shall be delineated by barrels. Tubular markers and barrels shall meet the requirements of 619. Tubular markers shall be secured to the pavement.

3.13.3.2 Unless otherwise precluded by weather conditions, longitudinal joints shall not remain open to traffic longer than 30 hours.

3.13.4 If a bulkhead is not used to form the transverse joint, the previously laid material shall be cut back to the designed slope and grade of the course. The joint face shall be coated with approved bituminous bonding material meeting the requirements of 410.2.1 before the fresh mixture is placed against it. Extreme care shall be taken to ensure that no unevenness occurs at the joint. If unsatisfactory riding qualities are obtained at the transverse joint in the wearing course, the joint shall be corrected by an approved method.

3.13.4.1 Prior to opening any lane(s) to traffic, transverse joints shall be ramped by means of an asphalt fillet at a minimum of 5 feet (1.5 m) horizontal to 1 inch (25 mm) vertical slope.

3.13.5 An approved bituminous bonding material meeting the requirements of 410.3.4.2 shall be applied to completely cover all joint contact surfaces.

3.13.5.1 When specified, a bituminous pavement joint adhesive, Item 403.6, shall be applied to the longitudinal joint. If joint adhesive has not been specified, an approved bituminous bonding material meeting the requirements of 410.3.4.2 shall be applied to completely cover all joint contact surfaces.

3.13.5.2 Joint adhesive shall be applied to the longitudinal joints so that the entire joint surface is covered with a minimum 1/8 inch thick layer of material. If a wedge joint is used the upper 4 inches of joint surface shall be covered with joint adhesive.

3.13.5.3 The joint face on which the joint adhesive is to be applied shall be dry, free from loose material, dust, or other debris that could interfere with adhesion. A hot air lance shall be used to dry and clean the joint face immediately prior to application of joint adhesive. If dust or debris adheres to the joint adhesive, it shall be cleaned or recoated as directed by the Engineer.

3.13.5.4 Trucks or traffic shall not drive across the joint adhesive until it has cooled sufficiently to prevent damage from tracking.

3.13.5.5 Joint adhesive shall be melted in a jacketed double boiler melting unit, which is equipped with an effective agitation system as recommended by the joint adhesive manufacturer. The joint adhesive shall be applied at the temperature specified by the manufacturer and shall not be heated above the safe heating temperature specified by the manufacturer.

3.13.5.6 Joint adhesive shall be applied using a pressure feed wand applicator system equipped with an applicator shoe as recommended by the manufacturer. A pour-pot applicator will be allowed on wedge joints only.

3.13.6 A tapered overlapping ("wedge") joint may be used on all longitudinal joints provided that the adjacent lane can be placed when the existing surface temperature is above 50° F (10 °C).

3.13.6.1 An inclined face (3:1) on the joint shall be formed in the first bituminous mat placed. The inclined face may be for the entire height or an inclined face with a 1/2 in (13 mm) maximum vertical face at the top of the mat.

3.13.6.2 After the initial mat is placed, the mat shall be rolled to the edge of the unconfined face.

3.13.6.3 When the adjoining mat is placed the initial longitudinal wedge shall be treated as in 3.13.5.

3.13.6.4 The joint matching and compaction shall be performed in accordance with 401.13.2.

3.13.7 The Contractor shall furnish and have available a 10 ft (3 m), light-weight metal straightedge with a rectangular cross-section of 2 by 4 in (50 by 100 mm) at the paver at all times during paving operations. All courses shall be tested with the straightedge laid parallel to the centerline and any variations from a true profile exceeding 3/16 in (5 m) shall be satisfactorily eliminated. The finished surface of the pavement shall be uniform in appearance, shall be free from irregularities in contour, and shall present a smooth-riding surface.

3.14 Replacement - General

3.14.1 If unsatisfactory areas are found in any course, the Contractor shall remove the unsatisfactory material and replace it with satisfactory material after coating the exposed edges with suitable bituminous material.

3.16 Finished Appearance - General

3.16.1 Any bituminous material remaining on exposed surfaces of curbs, sidewalks, or other structures shall be removed.

3.17 Quality Control

3.17.1 The Contractor shall operate in accordance with a Quality Control Plan, hereinafter referred to as the "Plan", sufficient to assure a product meeting the contract requirements. The plan shall meet the requirements of 106.03.1 and these special provisions.

3.17.2 The Plan shall address all elements which affect the quality of the Plant Mix Pavement including, but not limited to, the following:

- (a) Job mix formula(s).
- (b) Hot asphalt mix plant details.
- (c) Stockpile Management.
- (d) Make & type of paver(s).
- (e) Make & type of rollers including weight, weight per inch (centimeter) of steel wheels, and average ground contact pressure for pneumatic tired rollers.
- (f) Name of Plan Administrator.
- (g) Name of Process Control Technician(s).
- (h) Name of Quality Control Technician(s).
- (i) Mixing & Transportation.
- (j) Process Control Testing.
- (k) Placing sequence and placing procedure for ride quality.
- (l) Paving and Weather Limitations.
- (m) Sequence for paving around catch basins, under guard rail, around curb, at bridges, and intersections, drives and minor approaches, to ensure a proper finish and drainage.
- (n) Procedure for fine grading the top of the surface to be paved.

3.17.3 The Plan shall include the following personnel performing the described functions and meeting the following minimum requirements and qualifications:

- A) **Plan Administrator** meeting one of the following qualifications:
 - 1) Professional Engineer with one year of highway experience acceptable to the Department.
 - 2) Engineer-In-Training with two years of highway experience acceptable to the Department.
 - 3) An individual with three years highway experience acceptable to the Department and with a Bachelor of Science Degree in Civil Engineering Technology or Construction.
 - 4) An individual with five years of paving experience acceptable to the Department.
 - 5) Plan Administrators shall also be certified as a QA Technologist by New England States Technician Certification Program (NETTCP).

- B) **Process Control Technician(s) (PCT)** shall utilize test results and other quality control practices to assure the quality of aggregates and other mix components and control proportioning to meet the job mix formula(s). The PCT shall periodically inspect all equipment used in mixing to assure it is operating properly and that mixing conforms to the mix design(s) and other contract requirements. The Plan shall detail how these duties and responsibilities are to be accomplished and documented and whether more than one PCT is required. The Plan shall include the criteria utilized by the PCT to correct or reject unsatisfactory materials. The PCT shall be certified as a Plant Technician by the New England States Technician Certification Program or be a Materials Testing Technician in Training, working under the direct observation of a NETTCP certified Plant Technician.
- C) **Quality Control Technician(s) (QCT)** shall perform and utilize quality control tests at the job site to assure that delivered materials meet the requirements of the job mix formula(s). The QCT shall inspect all equipment utilized in transporting, laydown, and compacting to assure it is operating properly and that all laydown and compaction conform to the contract requirements. The plan shall detail how these duties and responsibilities are to be accomplished and documented, and whether more than one QCT is required. The Plan shall include the criteria utilized by the QCT to correct or reject unsatisfactory materials. The QCT shall be certified as a HMA Paving Technician as certified by the New England States Technician Certification Program or be a Materials Testing Technician in Training, working under the direct observation of a NETTCP certified HMA Paving Technician.

3.17.4 The Plan shall detail the coordination of the activities of the Plan Administrator, the PCT and the QCT. The Plan shall also detail who has the responsibility to reject material, halt production or stop placement.

3.17.4.1 All issues agreed to at the Pre-Pave meeting shall be considered to be part of the Plan.

3.17.5 Asphalt pavement shall be sampled, tested, and evaluated by the Contractor in accordance with the minimum process control guidelines in Table 3.

Table 3 - Minimum Process Control Guidelines

PROPERTIES	TEST FREQUENCY	TEST METHOD
Temperature of Mix	6 per day at paver hopper and plant	
Surface Temperature	As needed	
Temperature of Mat	4 per day	
Density	1 per 500 tons (500 metric tons) or minimum 2 per day	AASHTO T 230 or ASTM D 2950 (Core or Nuclear)
Maximum Theoretical Specific Gravity	1 per day of operation	AASHTO T-209
Fractured Faces	1 per 2000 tons (1800 metric tons) for Gravel Sources only	AASHTO T 11 & AASHTO T 27
Aggregate Gradation & Asphalt Binder content	1 per 750 tons (700 metric tons) recommended	AASHTO T 164
Asphalt Binder	As needed	AASHTO M 226
Thickness	Contractor Defined	Contractor Defined

3.17.6 Rejection by Contractor. The Contractor may, prior to sampling, elect to remove any defective material and replace it with new material at no expense to the State.

3.17.6.1 No wearing course pavement shall be removed or repaired without prior approval of the Engineer.

3.17.7 The Contractor may utilize innovative equipment or techniques not addressed by the specifications or these provisions to produce or monitor the production of the mix, subject to approval by the Engineer.

3.18 Quality Assurance.

3.18.1 Asphalt pavement designated for acceptance under Quality Assurance (QA) provisions will be sampled once per sublot on a statistically random basis, tested, and evaluated by the Department in accordance with 106.03.2 and the acceptance testing schedule in Table 4. Testing shall not take place until the material has been placed and deemed acceptable by the Contractor.

Table 4 - Acceptance Testing Schedule

PROPERTIES	POINT OF SAMPLING	LOT SIZE	SUBLOT SIZE	TEST METHOD
Gradation	Behind paver & before rolling ⁽⁴⁾	401.3.18.2	750 tons (700 metric tons)	AASHTO T 30 NHDOT B-1
Asphalt Binder content	Behind paver & before rolling ⁽⁴⁾	401.3.18.2	750 tons (700 metric tons)	AASHTO T 164 NHDOT B-2 NHDOT B-6
Maximum theoretical specific gravity	Compacted Roadway ⁽¹⁾ Core		750 tons (700 metric tons)	NHDOT B-8 AASHTO T 209
In Place Air Voids in total mix ^(5,6,7)	Compacted roadway ⁽¹⁾ core	401.3.18.2	750 tons (700 metric tons)	NHDOT B-8 AASHTO T 269
Ride Smoothness ⁽⁷⁾	Completion of wearing surface	Total project	0.1 lane mile (0.2 lane km)	401.3.19.4
Cross Slope ⁽⁷⁾	Completion of wearing surface	Total project	1 per 5 full stations	401.3.19.5
Thickness ⁽²⁾⁽⁵⁾⁽⁷⁾	Compacted roadway ⁽¹⁾ core	Total project	750 tons (700 metric tons)	NHDOT B-8 ASTM D 3549

- (1) Excluding bridge pavements.
- (2) Measurements taken from full depth cores obtained for in place air voids determination.
- (3) For leveling course, samples to be taken at the plant.
- (4) Sampling and testing will not be done for leveling course.
- (5) Not Including leveling course
- (6) When the contractor is supplying mix to more than one paver simultaneously, contractor's personnel shall keep a running total of tonnage supplied to each paver on each paver.
- (7) Tier 1 Item only

100

3.18.2 Lot Size. For purposes of evaluating all acceptance test properties a lot shall consist of the total quantity represented by each item listed under the lot size heading in the table above. Each lot will be broken down into at least 3 sublots.

The Contractor may request a change in the job mix formula. If the request is approved, all of the material produced prior to the change will be evaluated on the basis of available tests and a new lot will begin. Three sublots must be sampled and tested before a new lot may begin.

3.18.2.1 A lot for Gradation, Asphalt Content and In Place Air Voids shall be the total quantity represented by the job mix formula with the following exception; the shoulders will be evaluated as a separate lot for in place air voids.

3.18.3 Sublot Size. The quantity represented by each sample will constitute a sublot. The size of each sublot shall be as listed under the sublot size heading in Table 4. If there is insufficient quantity in a lot to make up at least three sublots of the designated size in Table 4, then the lot quantity will be divided into three equal sublots.

If there is less than one half of a sublot remaining at the end, then it shall be combined with the previous sublot. If there is more than one half sublot remaining at the end, then it shall constitute the last sublot and shall be represented by test results.

3.18.4 Test Results. The Engineer may calculate pay factors and pay adjustments at any time while a lot is being produced. This may be necessary for a partial estimate or to see if quality is falling to a point where immediate attention is required. Pay factors will be determined from all available acceptance tests for the lot being evaluated.

3.19 Quality Assurance Acceptance Testing

3.19.1 Gradation and Asphalt Binder Content. Samples for gradation and asphalt binder content shall be obtained from behind the paver in conformance with NHDOT procedure B-7 (see appendix A) and taken from each pavement layer by the Contractor in the presence of the Engineer. The sample locations will be established by selecting a random location within each sublot in accordance with 106. Sample locations (center of sample) will not be within 1 foot (0.3 meter) from an edge of pavement or within 4 feet (1.2 meters) from any structure. Sample locations falling within 4 feet (1.2 meters) from any structure will be relocated 4 feet (1.2 meters) from the structure along station at the same offset.

Where samples have been taken, new material shall be placed and compacted to conform to the surrounding area immediately after the samples are taken. Samples shall be accompanied by a sample tag containing the following information:

- (a) Project name and number.
- (b) Lot and sublot number.
- (c) Material type.
- (d) Date placed.
- (e) Location in station and offset, tonnage
- (f) Contract Administrator
- (g) Sampler
- (h) Item number

When the project exceeds 30 minutes travel time from the testing laboratory location, material samples will be taken and identified by NHDOT project personnel and shall be transported before cooling by the Contractor and delivered to NHDOT testing technicians at the testing laboratory location. Samples lost in transit will incur a penalty of 5% of the bid price for the entire subplot represented by that sample. Sublots with no test results due to a lost sample will not be evaluated and the total quantity represented by that subplot shall not be included in any positive pay factor.

3.19.1.1 Testing. Target values shall be as specified in the job mix formula. All sieve sizes specified in the job mix formula will be evaluated for gradation. The specification limits in Table 5 will be used for calculating pay factors for gradation and asphalt binder content.

Table 5 - Gradation and Asphalt Binder Specification Limits

PROPERTY	MAXIMUM AGGREGATE SIZE			
	1" (25.0 mm)	3/4" (19.0 mm)	1/2" (12.5 mm)	3/8" (9 mm)
	USL and LSL (Target +/- %)			
1 1/2" (37.0 mm)	0			
1-1/4 in (31.5 mm)	8.0			
1 in (25.0 mm)	8.0	0		
3/4 in (19.0 mm)	7.0	5.0	0	
1/2 in (12.5 mm)	7.0	5.0	4.0	0
3/8 in (9.5 mm)	7.0	5.0	4.0	4.0
No. 4 (4.75 mm)	4.0	4.0	3.0	4.0
No. 8 (2.36 mm)	4.0	4.0	3.0	3.0
No. 16 (1.18 mm)	2.0	2.0	2.0	2.0
No. 30 (0.600 mm)	2.0	2.0	2.0	2.0
No. 50 (0.300 mm)	2.0	2.0	2.0	2.0
No. 100 (0.150 mm)	2.0	2.0	2.0	2.0
No. 200 (0.075 mm)	0.8	0.8	0.8	0.8
Asphalt Binder	0.4	0.4	0.4	0.4

Any subplot with a gradation or asphalt binder content falling outside the ranges of the reject limits in Table 6 will be either removed and replaced at the expense of the Contractor or require corrective action to the satisfaction of the Engineer. After replacement or correction, new samples will be taken and the old test results from that subplot will be discarded.

Table 6 - Gradation and Asphalt Binder Content Reject Limits (Deviation from Target)

SIEVE SIZE				
	1" (25.0 mm)	3/4 in (19 mm)	1/2 in (12.5 mm)	3/8 in (9.5 mm)
	Percent Passing By Weight – Combined Aggregate			
1-1/4 in (31.5 mm)				
1 in (25.0 mm)				
3/4 in (19.0 mm)	±12	(1)		
1/2 in (12.5 mm)	(1)	±10	(1)	

102

3/8 in (9.5 mm)	(1)	(1)	±10	(1)
No. 4 (4.75 mm)	±9	±9	±9	±9
No. 8 (2.36 mm)	±7	±7	±7	±7
No. 16 (1.18 mm)	±6	±6	±6	±6
No. 30 (0.600 mm)	(1)	(1)	(1)	(1)
No. 50 (0.300 mm)	(1)	(1)	(1)	(1)
No. 100 (0.150 mm)	(1)	(1)	(1)	(1)
No. 200 (0.075 mm)	±3	±3	±3	±3
Asphalt Binder: % of Mix	±1.0	±1.0	±0.8	±0.8

- (1) Reject limits will be waived for these sieves.

The Contractor shall have the option of requesting a change in job mix formula (aim change) values used for calculating quality level to reflect actual production values after the placement of two sublots as long as no change in plant production values are made. A new lot is not needed for this change.

3.19.2 In Place Air Voids. In place air voids shall be determined in accordance with AASHTO T 269 using 150 mm (6 inch) diameter cores taken from each pavement layer by the Contractor in the presence of the Engineer. Core sampling shall be in conformance with AASHTO T 230 and NHDOT B-8 (see appendix A). Full depth cores containing all new pavement layers shall be required. Core locations (center of core) will be established by selecting a random location within each subplot in accordance with 106. Cores will not be located in the following areas:

- (a) Within 1 foot (0.3 meter) from an edge of pavement.
- (b) Within 4 feet (1.2 meters) from any structure. Core locations falling within this area will be relocated 4 feet (1.2 meters) from the structure along station at the same offset.
- (c) Within shoulders 4 feet (1.2 meters) or less in width.
- (d) Within 1 foot (0.3 meter) from any break in slope across the mat surface.

Cores shall be taken before opening pavement to traffic, except when location of core is within the last hour of that day's placement. Cores shall be taken within 24 hours after placement. Where cores have been taken, new material shall be placed and compacted to conform to the surrounding area the same day the samples are taken. Core samples shall be accompanied by a sample tag containing the following information:

- (a) Project name & number.
- (b) Lot and subplot number.
- (c) Material Type.
- (d) Date placed.
- (e) Date sampled.
- (f) Location in station and offset, and/or tonnage.
- (g) Plan thickness.
- (h) Contract Administrator
- (i) Sampler
- (j) Item number

The complete sample(s) (unseparated) shall be protected against damage, transported and delivered by the Contractor within one working day to NHDOT testing technicians at the testing lab location. Sublots where the core becomes lost or damaged will be resampled at the direction of the Engineer at the Contractor's expense.

The specification limits in Table 7 will be used for calculating pay factors for in place air voids for each lot:

Table 7 - In Place Air Voids Acceptance Limits

TARGET (%)	LSL	USL
Average of Samples	- 2.0% ¹	+2.0% ²

¹ But not less than 3%

² But not more than 9%

When a core is less than 80% or more than 120% of the nominal thickness, a new core will be taken in the same subplot at a random location for the determination of in place air voids.

A subplot with a test result less than 2.0% for in place air voids will be rejected and subject to removal and replacement.

3.19.2.1 Maximum Theoretical Density (MTD). MTD shall be determined in conformance with AASHTO T 209 once per subplot from the core obtained for determining in place air voids.

3.19.2.2 Disputed Cores. If a Contractor believes that a core result is invalid for whatever reason, the Contractor shall notify the Engineer of this in writing within 24 hrs. Of being informed of the test result. After being informed of the disputed core result, the Engineer will select five random core locations, one in each fifth section of the disputed subplot at the same offset as the disputed core. The Contractor shall cut the cores at the selected locations and deliver them to the testing technician. If there are 10 or more cores already tested to date, the pay factor for voids in the lot will be calculated (without using the result of the disputed core). If less than ten cores have been tested in the disputed lot, the five cores shall be held until ten cores have been tested or the lot is complete, whichever comes first, at which time the pay factor will be calculated.

If the pay factor for the lot that contains the disputed result is 0.95 or greater, and the disputed test result is outside three standard deviations from the mean value of the lot (calculated without using the result of the disputed core), the five cores shall be tested and the average value of the five will be calculated.

If any of these five cores falls outside three standard deviations from the mean value for the lot (calculated without using the result of the disputed core), the original core test value will stand. If the five cores fall within three standard deviations of the mean value the average of the five cores will be used as the core result for the disputed subplot.

If the five cores are not used, the Contractor shall pay for the cost of testing.

3.19.3 Pavement Thickness. The thickness requirements contained herein shall apply only when each pavement layer is specified to be a uniform thickness greater than 3/4 inch (19 mm). The combined total thickness of the hot asphalt mix or mixes will be measured in conformance to ASTM D 3549 to determine compliance with the acceptance tolerance. Measurements shall be obtained from full depth cores containing all new pavement layers removed for determining in place air voids after the placement of the wearing surface. Cores shall include all new layers placed. A leveling course, or the first layer over a milled or existing surface, shall be excluded from thickness measurement.

104

3.19.3.1 Once each combined thickness measurement has been taken, a thickness index will be calculated. The thickness index is the actual deviation from target divided by the allowable tolerance. This will allow statistical comparisons to be made among measurements based on varying specified thickness. Thickness indexes will be established for the sole purpose of calculating pay factors. Thickness index shall be calculated under the following equation using the specification limits in Table 8.

$$TI = \frac{(M - ST)}{T}$$

where: TI = Thickness Index
 ST = Specified Thickness
 M = Core Measurement
 T = ¼" per pavement course

Table 8 - Thickness Index Acceptance Limits

	TARGET	LSL	USL
Thickness Index	0.00	-1.00	+1.00

3.19.3.1 Disputed Thickness If a Contractor believes that a thickness result is invalid for whatever reason, the Contractor shall notify the Engineer of this in writing within 24 hrs of being informed of the test result. After being informed of the disputed result, the Engineer will select three random core locations in the disputed subplot and the Contractor shall cut the cores at the selected locations and deliver them to the testing technician. If there are 10 or more cores already tested to date, the pay factor for thickness in the lot will be calculated (without using the result of the disputed core). If less than ten cores have been tested in the disputed lot, the three cores shall be held until ten cores have been tested or the lot is complete, whichever comes first, at which time the pay factor will be calculated.

If the pay factor for the lot that contains the disputed result is 0.95 or greater, and the disputed test result is outside three standard deviations from the mean value of the lot (calculated without using the result of the disputed thickness), the three cores shall be measured and the average value of the three will be calculated.

If any of these three cores falls outside three standard deviations from the mean value for the lot (calculated without using the result of the disputed core), the original thickness test value will stand. If the three cores fall within three standard deviations of the mean value the average of the three measurements will be used as the thickness for the disputed subplot.

If the three cores are not used, the Contractor shall pay for the cost of testing.

3.19.4 Ride Smoothness.

3.19.4.1 The Contractor shall furnish and have available a 10 foot (3 meter), light weight metal straightedge with a rectangular cross section of 2" x 4" (50 x 100 mm) at the paver at all times during paving operations. All courses shall be tested with the straightedge laid parallel or perpendicular to the centerline and any variations from a true profile or cross section exceeding 3/16 of an inch (5 mm) shall be satisfactorily eliminated. The finished surface of the pavement shall be uniform in appearance, free from irregularities in contour and shall present a smooth-riding surface.

105

3.19.4.2 A GM type profilometer will be furnished by the Department for determination of pavement smoothness. This device provides a Ride Number in both wheel paths that are averaged to produce a ride number for the surface tested. In the event the Engineer feels that there is a significant difference in the wheel path profiles, a Ride Number evaluation of the individual wheel paths will be made. The surface will be tested within 30 days after the wearing surface and pavement markings for each discrete section of the project are complete. Immediately before testing, the Contractor will insure the surface is entirely free from any foreign matter that may affect the test results. No special considerations will be given to criteria such as degree of curve and vertical geometry. Ride Number will be calculated to the nearest one hundredth for each 0.1 mile (0.2 km) segment.

3.19.4.3 Profilometer testing will include all mainline paving including bridges with lanes at least 11 feet (3.3 meters) wide. Testing will begin 20 feet (6 meters) after the approach joint and end 20 feet (6 meters) before the departure joint. The pavement will not be evaluated over bridge expansion joints, tapers, raised pavement markings, and sections less than 0.1 mile (0.2 km) in lane length.

3.19.4.4 All areas with bumps or high points exceeding 0.3 inches in 25 feet (8 mm in 7.6 meters) shall be corrected by removal of a minimum of 1 inch (25 mm) of the full lane width by the length required (a minimum of 100 feet (30 meters)) and replaced at the Contractor's expense.

3.19.4.5 The Ride Number average of all sublots will be used to determine the final pay factor. The final pay factor shall not exceed 1.05 and will be computed as follows:

For Level 1 Projects: (Ride Number 4.20)
Pay Factor = $RN(0.5) - 1.1$

For Level 2 Projects: (Ride Number 4.14)
Pay Factor = $RN(0.5682) - 1.3523$

3.19.4.6 A final Ride Number shall be established after the wearing surface is completed and striped. Separate completed sections of a project will be evaluated before the entire wearing surface is completed. Any subplot with a ride number less than 3.7 shall be repaired or replaced.

3.19.4.6.1 Any subplot that has an individual wheel path ride number less than 3.7 shall be repaired or replaced. The repair treatment shall be for the full width of the lane. Sublots that have been repaired or replaced shall be reevaluated for ride smoothness and then averaged with all other sublots to determine the final project pay factor. Construction joints resulting from repairs or replacement will be included.

3.19.4.6.2 Level 1 will generally be all interstate and limited access highways with the following exception:

- (a) A single course overlay that has a before ride number average of less than 4.00

3.19.4.6.3 Level 2 will generally be all other highways with the following exceptions:

- (a) Where the wearing course must be constructed in short sections (< 3 sublots).
(b) Projects shorter than one half mile in length.

106

- (c) Projects with a posted speed of 35 MPH or less.
- (d) Projects with many driveways and/or cross roads with constant traffic.
- (e) District resurfacing projects.

3.19.5 Cross Slope.

3.19.5.1 Cross slope will be measured once per subplot behind the paver after final rolling of the wearing surface has taken place. Cross slope will only be evaluated when specific slopes and superelevations are shown on the plans for the entire project. Only travel lanes will be evaluated for cross slope. Measurements will be taken only in areas of normal tangent or full bank curves on even stations. The procedure for measuring the cross slope shall be by placing a 10 foot (3-meter) metal straight edge on the surface perpendicular to the traveled lane. A 4 foot (1.2 meter) direct reading level shall be placed on top of it. Percent cross slope shall be read and recorded. A second reading 180 degrees to the first shall be taken and recorded and the two shall be averaged for the test result.

3.19.5.2 Once a cross slope percentage has been measured, a cross slope index (CSI) will be calculated. The target cross slope shall be defined as the cross slope shown on the plans or as ordered to the nearest tenth of a percent. The CSI is the actual deviation from the target divided by the allowable tolerance of 0.5 percent. This will allow statistical comparisons to be made among measurements based on varying specified cross slopes. The CSI will be established for the sole purpose of calculating pay factors. The CSI shall be calculated under the following equation using the specification limits in Table 10.

$$CSI = \frac{(M - SCS)}{T}$$

- where: CSI = Cross Slope Index
 SCS = Specified Cross Slope in percent
 M = Measured Cross Slope in percent
 T = 0.50

Table 10 - Cross Slope Index Acceptance Limits

	TARGET	LSL	USL
Cross Slope Index	0.00	-1.00	+1.00

3.19.6 Rejection of Material.

3.19.6.1 An individual subplot. For any sublots with any test results exceeding the specified reject limits, the Engineer will:

- (a) Require complete removal and replacement with hot asphalt mix meeting the contract requirements at no additional expense to the department, or
- (b) Require corrective action to the satisfaction of the Engineer at no additional expense to the Department.

3.19.6.2 A lot in progress. The Engineer will shut down paving operations whenever:

107

- (a) The pay factor for any property drops below .90 and the Contractor is taking no corrective action, or
- (b) Three consecutive tests show that less than 50 percent by weight of the particles retained on the No. 4 (4.75 mm) sieve have at least one fractured face.

Paving operations shall not resume until the Engineer determines that material meeting the contract requirements can be produced. Corrective action will be considered acceptable by the Engineer if the pay factor for the failing property increases. If it is determined that the resumption of production involves a significant change to the production process, the current lot will be terminated and a new lot will begin.

3.19.6.3 Resampling and Retesting. All requests to resample and test a subplot shall be in writing to the Department of Transportation's Asphalt Paving QC/QA Coordinator.

Method of Measurement

4.1 Asphalt pavement mixture will be measured by the ton (metric ton) to the nearest 0.1 ton (0.1 metric ton), and in accordance with 109.01. Batch weights will be permitted as a method of measurement only when the provisions of 3.8.3 are met, in which case, payment will be based on the cumulative weight of all the batches. The quantity will be the weight used in the accepted pavement, and no deduction will be made for the weight of asphalt binder or additives in the mixture.

4.1.1 Due to possible variations in the specific gravity of the aggregates, and to possible field changes in areas to be paved, the quantity used may vary from the proposal quantities, and no adjustment in contract unit price will be made because of such variations.

4.2 Asphalt pavement, removed because of faulty workmanship or contamination by foreign materials, will not be included in the pay quantity.

4.3 Hot bituminous bridge pavement, base course of the depth and additional materials specified will not be measured, but shall be the ton (metric ton) final pay quantity in accordance with 109.11 for compacted material within the limits shown on the plans.

4.4 Pavement Joint Adhesive will be measured by the linear foot (linear meter) of material incorporated in the work.

Basis of Payment

5.1 All work performed and measured as prescribed above will be paid for at the contract unit price as provided in the respective sections for each type specified.

5.2 Tack coat material ordered under 3.10.9 will be subsidiary to the paving items.

5.3 Approved bituminous material ordered for the coating of contact surfaces and joints as specified will be subsidiary.

5.4 Plant or project lighting, or overtime required due to night operations will be subsidiary to the paving items.

Asphalt cement additives will be subsidiary to the paving items.

108

5.6 Implementtion of the Quality Control Plan and costs associated with obtaining core samples for acceptance testing shall be subsidiary. When items are to be accepted under Quality Assurance provisions, pay adjustment will be made in accordance with 106.03.2.4 as specified below.

5.6.1 **Gradation composite pay factor (CPF).** The total price for each lot will be adjusted by a composite pay factor (CPF) based on the gradation of the material after extraction using the pay factors for each sieve size and the sieve size weight factors in Tables 11, 11a & 11b.

Table 11 - Sieve Size Weight Factors 1 inch (25 mm)

PROPERTY		WEIGHT FACTOR "f"
	½ inch (12.5 mm)	6
	#30 (0.600 mm)	4
Gradation (each sieve)	#8 and #200 (2.36 mm 0.075 mm) sieves	8
	All other sieves (each)	2

Table 11a - Sieve Size Weight Factors ¾ inch (19 mm)

PROPERTY		WEIGHT FACTOR "f"
	3/8" (9.5 mm)	6
	#30 (0.600 mm)	4
Gradation (each sieve)	#8, and #200 (2.36 mm, 0.075 mm) sieves	8
	All other sieves (each)	2

Table 11b - Sieve Size Weight Factors ½ inch and ¾ inch (12.5 mm and 9.5 mm)

PROPERTY		WEIGHT FACTOR "f"
	No. 4 (4.75 mm)	6
	#30 (0.600 mm)	4
Gradation (each sieve)	#8, and #200 (2.36 mm, 0.075 mm) sieves	8
	All other sieves (each)	2

$$\text{Composite Pay Factor (CPF)} = \frac{[f_1(PF_1) + f_2(PF_2) + \dots + f_j(PF_j)]}{\sum f}$$

5.6.2 **Pay Adjustment.** The pay adjustment for each measured characteristic will be determined by the following equation:

$$PA_j = (Pf_j - 1) \frac{f_j}{\sum f} (Q)(P)$$

where: PA = Pay adjustment payment in dollars for each characteristic.
Pf = Pay factor or composite pay factor for each characteristic.
f = Weight factor from Table 12 for each characteristic.

- $\sum f$ = Sum of weight factors.
 Q = Quantity computed from all accepted delivery records for the lot.
 P = Contract unit price per ton.

Table 12 – Tier 1 Weight Factors

MEASURED CHARACTERISTIC	WEIGHT FACTOR "F"
Gradation	0.15
Asphalt Binder Content	0.15
In Place Air Voids	0.20
Thickness	0.10
Cross Slope	0.10
Ride Smoothness	0.30

Table 13 – Tier 2 Weight Factors

MEASURED CHARACTERISTIC	WEIGHT FACTOR "F"
Gradation	0.25
Asphalt Binder Content	0.25
Air Voids	0.5

5.6.3 Pay adjustment, Hot Bituminous Pavement QC/QA Items. The pay adjustment for gradation, asphalt binder content, in place air voids, and ride quality (made up of the sum of all sublots) will be applied to item 1010.3. Pay adjustments may be applied at the end of each month based on all available test results for each lot.

5.7 Pavement Joint Adhesive will be paid for at the contract unit price per linear foot (linear meter), complete in place.

5.7.1 Recoating of the joint, as described in 3.13.5, shall be at the Contractor's expense.

Appendix A

NHDOT Test Procedure B-7
Sampling Bituminous Paving Mixtures For Acceptance Testing.

Sample shall be taken behind the paver after placement and before compaction

Sample location is randomly selected by the Contract Administrator

When paving over aggregate base course or cold planed surface, use a rectangular metal plate no less than 12 in. (300 mm) each side. Center plate on sample location.

After paver passes over plate, measure back to sample location.

Locate the edges of the plate.

Using a flat-bottomed scoop large enough to obtain up to a 3000 gram sample. Place scoop on plate and push across the mat (perpendicular to the center line), through the center of the plate, filling the scoop to obtain the sample size specified below.

Required Sample Size

Base Courses	2000-3000 grams
Binder Courses	1500-3000 grams
Surface Courses	1000-3000 grams
Sand Courses	500-3000 grams

When sampling over an existing pavement the plate is not required.

NHDOT Procedure B-8
Sampling and Testing Procedure for In Place Air Voids

Cores will be taken at random locations selected by the Contract Administrator.

Cores will be delivered intact by the contractor to the NHDOT inspector at the testing laboratory.

If Cores are lost or damaged, new cores shall be taken at the same location as the previous core

Cores shall be measured for thickness following ASTM D 3549

Bulk specific gravity shall be determined by AASHTO T 166

Maximum Theoretical Density will be determined using the core by AASHTO T 209

In Place Air Voids shall be determined by AASHTO T 2

///

SECTION 403 -- HOT BITUMINOUS PAVEMENT

Description

1.1 This work shall consist of constructing one or more courses of bituminous pavement on a prepared base as shown on the plans or as ordered. The methods may be classified as hand or machine.

1.1.1 Hand method shall include only the paving of raised islands, slopes, cattle passes, areas between rails at railroad crossings, existing sidewalks, drives, drive aprons, curb patch between concrete barrier and pavement, curb patch between granite curb and pavement, and paving of 50 tons (45 metric tons) or less added after the completion of paving operations.

1.1.2 Machine method shall include all paving not classified as hand method.

Materials

2.1 Materials and their use shall conform to the requirements of 401.2.

2.2 Temporary bituminous pavement shall conform to 401, Table 1. Thickness shall be as shown on the plans or as ordered by the Engineer.

Construction Requirements

3.1 Construction requirements shall be as prescribed in 401.3.

3.2 For temporary pavement only, amend portions of 401.3.12 as follows:

3.2.1 The requirements of 401.12.1.1 shall apply except rolling may be accomplished with a dual vibrating steel drum roller.

3.2.2 Delete 401.3.12.2.

3.3 For temporary bituminous pavement only delete 401.13.7.

3.4 Temporary bituminous pavement shall be removed when no longer needed.

Methods of Measurement

4.1 Hot bituminous pavement will be measured as prescribed in 401.4.

Basis of Payment

5.1 The accepted quantities of hot bituminous pavement will be paid for at the contract price per ton (metric ton) for the bituminous mixture, complete in place.

5.2 Bridge wearing course will be paid under machine method.

5.3 Hot bituminous bridge pavement, base course of the depth and additional materials specified is a final pay quantity item and will be paid for at the contract unit price per ton (metric ton) in accordance with 109.11.

112

5.4 The accepted quantity of temporary bituminous pavement will be paid for at the contract unit price per ton (metric ton) complete.

5.4.1 Removal of the temporary pavement will not be paid for under other items of the contract but will be subsidiary.

Pay items and units:

403.11	Hot Bituminous Pavement, Machine Method	Ton (Metric Ton)
403.119	Hot Bituminous Pavement, Machine Method (Night)	Ton (Metric Ton)
403.1199	Hot Bituminous Pavement, Machine Method, High Strength (Night)	Ton (Metric Ton)
403.12	Hot Bituminous Pavement, Hand Method	Ton (Metric Ton)
403.129	Hot Bituminous Pavement, Hand Method(Night)	Ton (Metric Ton)
403.351	Hot Bituminous Pavement, Aggregate 35 percent Wear, Machine Method	Ton (Metric Ton)
403.3519	Hot Bituminous Pavement, Aggregate 35 percent Wear, Machine Method (Night)	Ton (Metric Ton)
403.352	Hot Bituminous Pavement, Aggregate 35 percent Wear, Hand Method	Ton (Metric Ton)
403.51	Hot Bituminous Pavement, Aggregate 50 percent Wear, Machine Method	Ton (Metric Ton)
403.519	Hot Bituminous Pavement, Aggregate 50 percent Wear, Machine Method (Night)	Ton (Metric Ton)
403.52	Hot Bituminous Pavement, Aggregate 50 percent Wear, Hand Method	Ton (Metric Ton)
403.529	Hot Bituminous Pavement, Aggregate 50 percent Wear, Hand Method (Night)	Ton (Metric Ton)
403.6	Pavement Joint Adhesive	Linear Foot (linear Meter)
403.98	Hot Bituminous Concrete Leveling, Machine Method	Ton (Metric Ton)
403.99	Temporary Bituminous Pavement	Ton (Metric Ton)
403.XXXX1	Bituminous Pavement, _____(QC/QA Tier 1)	Ton (Metric Ton)
403.XXXX2	Bituminous Pavement, _____(QC/QA Tier 2)	Ton (Metric Ton)
1010.3	Quality Control/Quality Assurance (QC/QA) for Asphalt	Dollar

Pay items and units (English):

403.911	Hot Bituminous Bridge Pavement, 1 in Base Course (F)	Ton
403.91109	Hot Bituminous Bridge Pavement, 1 in Base Course (Night) (F)	Ton
403.9115	Hot Bituminous Bridge Pavement, 1 in Base Course, Aggregate 50 Percent Wear (F)	Ton

113

Pay items and units (Metric):

403.911	Hot Bituminous Bridge Pavement, 25mmBase Course (F)	Metric Ton
403.91109	Hot Bituminous Bridge Pavement, 25mmBase Course (Night) (F)	Metric Ton
403.9115	Hot Bituminous Bridge Pavement, 25 mm Base Course, Aggregate 50 Percent Wear (F)	Metric Ton

114

SECTION 410 -- BITUMINOUS SURFACE TREATMENT**Description**

1.1 This work shall consist of preparing and applying one or more prime or seal coats of bituminous material to a gravel or stone course. This work shall also consist of a tack coat applied to a bituminous concrete surface or a Portland cement concrete surface.

Materials

2.1 Bituminous material shall be the type and grade specified or ordered and shall conform to the requirements of AASHTO M 140 or M 208.

2.2 Blotter material shall be natural sand composed of hard, durable particles, free from loam, showing uniform resistance to abrasion. Gradation shall conform to 520, Table 2.

Construction Requirements

3.1 **Limitations.** Bituminous material shall not be applied on a wet surface, or when weather conditions would prevent the proper application and curing of the coat. The quantities, rate of application, temperatures, and areas to be treated shall be approved before application of bituminous material.

3.2 **Equipment.** Equipment required for this work shall be as follows:

- (a) A distributor shall be so designed, equipped, maintained, and operated such that bituminous material at even heat may be applied uniformly on variable widths of surface up to 24 ft (7.2 m), at readily determined and controlled rates from 0.02 to 2.0 gal/yd² (0.09 to 9L/m²), with uniform pressure, and with an allowable variation from any specified rate not to exceed 0.02 gal (0.08 L). Distributor equipment shall include a tachometer, pressure gauges, accurate volume measuring devices or a calibrated tank, and a thermometer for measuring temperatures of tank contents. Distributors shall be equipped with a power unit for the pump and with full circulation spray bars adjustable laterally and vertically. The spray bar shall contain spray nozzles providing a fan-shaped spray pattern adjusted so the vertical axis is perpendicular to the pavement surface. The spray pattern and spray bar height shall be adjusted to provide a uniform application of the tack coat without double coverage. The distributor shall be equipped with a mechanical device to adjust the spray height as material is discharged to keep a uniform height above the pavement for full coverage without overlapping. The distributor shall also be equipped with a hand-held spray attachment for applying the material to areas inaccessible to spray bars and to fill in irregular areas to provide full coverage. Approved sampling valves shall be installed in distributors and transport tank trucks to permit taking representative samples of the contents. The recommended location of the sampling valve is in the rear bulkhead of the tank roughly one-third of the height above the bottom. The inlet pipe shall project into the contained liquid as shown in AASHTO T 40. At least 1 qt (1 L) of material shall be drained off through the sampling valve and discarded before the desired sample is taken. New sample containers will be furnished by the Engineer. To prevent the loss of solvents, containers shall be sealed with a tight fitting cover immediately after being filled.
- (b) A rotary power broom for sweeping treated surface.
- (c) A steel-wheeled roller.
- (d) A self-propelled pneumatic-tired roller.

113

- (e) A sand spreader capable of spreading blotter material in sufficient quantity to prevent traffic pickup of the applied bituminous material.
- (f) A steel-brush drag of an approved type.

3.3 Preparation of Surface to be Treated.

3.3.1 Prime coat. The surface to be primed shall be shaped to the required grade and section, shall be free from all ruts, corrugations, segregated material, or other irregularities, and shall be uniformly compacted in accordance with 304.3.6.

3.3.1.1 Immediately before applying the prime coat, the surface shall be loosened slightly by dragging with a steel-brush drag.

3.3.2 Tack coat. The existing surface shall be patched and shall be free of irregularities to provide a reasonably smooth and uniform surface to receive the treatment. Unstable corrugated areas shall be removed and replaced with suitable patching materials. The edges of existing pavements that are to be adjacent to new pavement shall be cleaned to permit the adhesion of bituminous materials.

3.4 Application of Bituminous Material.

3.4.1 Prime coat. Bituminous material shall be applied to the width of the section to be primed by means of a pressure distributor in a uniform, continuous spread. When traffic is maintained, not more than one-half of the width of the section shall be treated in one application. Care shall be taken that the application of bituminous material at junctions is not in excess of the specified amount. Excess material shall be squeegeed from the surface. Skipped areas or deficiencies shall be corrected.

3.4.1.1 When traffic is maintained, one-way traffic shall be permitted on the untreated portion of the roadbed. As soon as the bituminous material has been absorbed by the surface and no longer picks up, traffic shall be transferred to the treated portion, and the remaining width of the section shall be primed.

3.4.2 Tack coat. Bituminous material shall be uniformly applied with an approved applicator. When ordered, a pressure distributor shall be used. The tack coat shall be applied in such a manner as to offer the least inconvenience to traffic and to permit one-way traffic without pickup or tracking of the bituminous material.

3.4.2.1 A tack coat shall be applied immediately prior to placement of pavement. The rate of application of emulsified asphalt shall be between 0.02 and 0.05 gal/yd² (0.09 and 0.23 L/m²), as determined by the Engineer depending on the relative absorbance and texture of the pavement surface.

3.5 Application of blotter material. If, after the application of the prime coat, the bituminous material fails to penetrate within the time specified and the roadway must be used by traffic, blotter material shall be spread in the amounts required to absorb any excess bituminous material. Care shall be taken not to cover a 6 in (150 mm) strip next to the centerline of the roadway until the untreated area has received the first application of bituminous material.

3.5.1 When the entire width of the surface has been treated with bituminous material and blotter material, it shall be dragged with a steel-brush drag. The surface shall be brushed only the amount necessary to distribute the blotter material uniformly.

3.5.2 When ordered, the entire treated surface shall be rolled until the materials are thoroughly bonded.

3.5.3 Sufficient extra blotter material shall be applied whenever necessary to prevent traffic and the roller from picking up the bituminous material.

3.5.4 Additional brush dragging may be required to keep the blotter material uniformly distributed until the bituminous material is thoroughly cured.

3.5.5 The primed surface shall be kept in repair. All holes, ravel, and deficient areas shall be patched and repaired with bituminous treated materials, as approved.

3.5.6 When the bituminous material is thoroughly cured, blotter material remaining on the treated area shall be removed by sweeping with an approved power broom. This operation must be accomplished before subsequent application of any seal coat.

3.6 Seal Coat.

3.6.1 When directed, a seal coat shall be applied at the rate in gallons per square yard (liters per square meter) specified on the plans or as ordered, and by the same method as the prime coat.

3.6.2 Blotter material at the rate ordered shall be applied before the bitumen has set; the entire treated surface shall be dragged, rolled and maintained. The remaining blotter material shall be removed, all by the same methods as specified for the prime coat.

3.7 Finished Appearance.

3.7.1 Any bituminous material splashed or sprayed onto exposed surfaces of curbs, sidewalks, or other masonry structures shall be removed by sandblasting at the Contractor's expense.

Method of Measurement

4.1 Bituminous material will be measured by the ton or pound (metric ton or kilogram), and in accordance with 109.01. Measurements by the ton (metric ton) will be made to the nearest 0.1 ton (0.1 metric ton) and by the pound (kilogram) to the nearest pound (kilogram).

4.2 Blotter material furnished will be subsidiary.

Basis of Payment

5.1 The accepted quantities of bituminous surface treatment will be paid for at the contract price per ton or pound (metric ton or kilogram) for bituminous material, complete in place.

5.2 Payment for patching existing pavements under 3.3.2 will be made at the contract unit price for Item 403.11 or Item 411.1, as ordered.

5.3 Emulsified asphalt for tack coat required under 401.3.5.5 will be subsidiary to the paving items.

Pay items and units:

410.21	Emulsified Asphalt for Tack Coat	Ton (Metric Ton)
410.22	Emulsified Asphalt for Tack Coat	Pound (Kilogram)
410.31	Asphalt Surface Treatment Including Blotter Material	Ton (Metric Ton)
410.41	Emulsified Surface Treatment Including Blotter Material	Ton (Metric Ton)

118

SECTION 411 -- PLANT MIX SURFACE TREATMENT

Description

1.1 This work shall consist of a leveling course when ordered and one or more courses of bituminous mixture constructed on an existing pavement.

Materials

2.1 Materials and their use shall conform to the requirements of 401.2 as amended below:

2.1.1 Unless a volumetric mix design has been performed by the contractor, the composition of the mixtures shall conform to historical gradation and binder content. Leveling course and 3/4" (19 mm) PMST shall be Type H unless otherwise noted.

Table 1 - Composition of Mixtures - Master Ranges Plant Mixed Surface Treatment						
Sieve Size	Type G 3/8 in (9.5 mm)			Type H 3/8 in (9.5 mm)		
	Percentage by Weight Passing					
	Min	Desired	Max	Min	Desired	Max
3/8 in (9.5 mm)	--	--	--	95.0	100	100
No. 4 (4.75 mm)	99	100	100	70.0	77	84.0
No. 8 (2.36 mm)	76.0	84	93.0	54.0	59	65.0
No. 16 (1.18 mm)	55.0	65	74.0	35.0	43	51.0
No. 30 (0.600 mm)	34.0	45	55.0	20.0	28	36.0
No. 50 (0.300 mm)	17.0	25	35.0	10.0	15	20.0
No. 100 (0.150 mm)	6.0	10	15.0	5.0	8	11.0
No. 200 (0.075 mm)	2.0	4	6.0	2.0	4	6.0
Percentage of Total Mix						
Asphalt Cement	6.5	7.0	7.5	6.25	6.7	7.25

2.1.4 Blotter materials shall be sand conforming to the requirements of Table 2.

Table 2 -- Blotter Material

Sieve Size	Percent by Weight Passing
No. 4 (4.75 mm)	100
No. 10 (2.00 mm)	70 - 92
No. 200 (0.075 mm)	0 - 6

119

Construction Requirements

3.1 Mixing plants shall be as prescribed in 401.3.1

3.2 Mixing and storage shall conform to 401.3.1.6.11, 401.3.6, and 401.3.7 with the following modifications:

3.2.1 If the aggregate contains sufficient moisture to cause foaming in the mixture, it shall be removed from the bins. The quantity of cold aggregate fed to the dryer shall be governed by the ability of the dryer to completely remove the moisture from the aggregate, as determined by the Engineer.

3.3 Weighing and hauling shall conform to 401.3.8

3.4 Placing shall conform to 401.3.10 with the following modifications:

3.4.1 The existing pavement shall be thoroughly dry and free from all dust, dirt, and loose material. Sweeping with a power broom supplemented by hand brooming may be required.

3.4.2 Existing pavement shall be treated with tack coat as prescribed in 410.3.4.2. When ordered, the existing pavement shall be treated as prescribed in 410.3.3.

3.4.3 A leveling course of hot bituminous concrete may be ordered to prepare the pavement for the finish course.

3.4.4 Any material delivered to the paver having a temperature lower than 250° F (121°C) shall not be used.

3.4.5 In those areas where the edges of the pavement are adjacent to paved or bituminous treated shoulders, the asphalt paving machine shall be equipped to produce a feathered edge, parallel to the direction of traffic, and a uniform longitudinal line shall be maintained at the outer edge of the applied pavement.

3.4.6 All bridges included within the limits of the work shall be treated curb to curb.

3.5 Compaction shall conform to 401.3.12 with the following modifications:

3.5.1 If necessary to prevent traffic pickup of the mixture, the surface of the work shall be given a light dusting of blotter material just prior to rolling with a pneumatic-tired roller. The surface shall be maintained thereafter by occasional back sanding and rolling as directed.

3.5.2 When more than 125 tons (115 metric tons) of mixture is being placed per hour, an additional steel-wheeled roller will be required.

3.5.3 Excess blotter material remaining on the pavement and on paved shoulders shall be removed prior to acceptance of the project.

3.5.4 After rolling has been completed, the edges of the pavement shall be trimmed as directed to secure a uniform line.

3.6 Only the last sentence of 401.3.13.7 shall apply to plant mix surface treatment.

Method of Measurement

- 4.1 Plant mix surface treatment will be measured as prescribed in 401.4.
- 4.2 Blotter material used on plant mix surface treatment will be subsidiary.

Basis of Payment

5.1 The accepted quantities of leveling course and plant mix surface treatment will be paid for at the contract unit price per ton (metric ton), complete in place.

5.1.1 Tack coat material required under 3.4.2 will be subsidiary to the leveling course and plant mix surface treatment items.

Pay items and units (English):

411.1	Hot Bituminous Concrete Leveling Course	Ton
411.15	Hot Bituminous Concrete Leveling Course, Aggregate 50 Percent Wear	Ton
411.19	Hot Bituminous Concrete Leveling Course(Night)	Ton
411.43	Plant Mix Surface Treatment(Asphalt Cement), 3/8 in	Ton
411.46	Plant Mix Surface Treatment(Asphalt Cement), 3/4 in	Ton

Pay items and units (Metric):

411.1	Hot Bituminous Concrete Leveling Course	Metric Ton
411.15	Hot Bituminous Concrete Leveling Course, Aggregate 50 Percent Wear	Metric Ton
411.19	Hot Bituminous Concrete Leveling Course (Night)	Metric Ton
411.410	Plant Mix Surface Treatment(Asphalt Cement), 9.5 mm	Metric Ton
411.419	Plant Mix Surface Treatment (Asphalt Cement), 19 mm	Metric Ton

SECTION 413 -- HOT-POURED CRACK SEALANT

Description

1.1 This work shall consist of filling the major cracks in the pavement with an approved sealant material. The cracks to be filled will be those designated by the Engineer.

Materials & Equipment

2.1 Material shall be of the hot-poured type and be a product as included on the Qualified Products List.

2.1.1 Material not covered by an asphalt pavement overlay shall meet the requirements of AASHTO M 301 (ASTM D 3405).

2.1.2 Material covered by an asphalt pavement overlay shall be low modulus conforming to ASTM D 3405, modified.

121

2.2 Equipment shall meet the approval of the Engineer and shall be maintained in good working condition at all times.

- (a) Air compressors shall be portable and capable of furnishing not less than 100 ft³ (3.0 m³) of air per minute at not less than 90 psi (620 kPa) pressure at the nozzle. The compressor shall be equipped with traps that maintain the compressed air free from oil and water.
- (b) Hand tools shall consist of brooms, shovels, metal bars with chisel-shaped ends, and any other tools that may be required to accomplish the work.
- (c) Melting kettles shall be of the double-boiler, indirect-fired, portable type. The space between the inner and outer shells shall be filled with a suitable heat transfer oil or substitute having a flash point of not less than 530°F (280°C). The kettle shall be equipped with a satisfactory means for agitating the joint sealer. This may be accomplished by continuous stirring with mechanically operated paddles or by a continuous circulating gear pump attached to the heating unit, or by both paddles and a pump. The kettle shall be equipped with a thermostatic control calibrated between 200° and 550°F (95° and 290°C). The kettle shall be mounted on rubber tires and shall be equipped with a metal shield beneath the firebox to protect the pavement.
- (d) Hand pouring pots shall be equipped with mobile carriages and rubber shoes and have flow control valves that allow all cracks to be filled to refusal.
- (e) Routers for reshaping cracks shall be of the multiblade rotary cutter head type.
- (f) Hot-air lances for blowing clean and drying cracks shall be an approved propane gas burner and compressed air device that does not allow the flame to touch the pavement.
- (g) The wand applicator shall be connected to the holding tank through an applicator hose that ensures the safety of the operator and allows the operator to control the flow of material. A device shall be mounted to bypass material into the holding tank if the applicator nozzle is shut off.

Construction Requirements

3.1 All cracks greater than 1/8 in (3 mm) up to 3/4 in (19 mm) in width shall be shaped with a power router to a dimension of 3/4 in (19 mm) ±1/8 in (3 mm) wide by 5/8 in (15 mm) deep rectangular shape and treated unless otherwise directed. Cracks greater than 3/4 in (19 mm) shall be treated but not routed. Router bits will be maintained to ensure that rectangular dimensions are achieved. A rounded shape will not be allowed.

3.2 All cracks ordered treated shall be hot-air lance cleaned of dirt, foreign material, and loose edges.

3.3 The material removed from the cracks shall be removed from the roadway surface prior to reopening the roadway to traffic.

3.4 The hot-poured sealant shall be applied at the temperature specified by the manufacturer and approved by the Engineer.

3.5 The hot-poured sealant shall be applied to the cracks using hand pouring pots or wand applicators immediately following hot-air lance cleaning. Only wand applicators shall be used for crack filling when cracks are not covered by an asphalt pavement overlay.

3.6 All cracks to be treated shall be filled to 1/16 in to 1/8 in (1 mm to 3 mm) below the pavement surface with hot-poured sealant with the sealant left slightly concave. Filling flush, overfilling, and over banding of cracks will not be allowed. Sealant shall tightly bond to the pavement. The sealant bond to

the pavement shall be checked. If the sealant does not bond to the pavement, sealant shall be removed and crack sealing operations discontinued until debonding problem is corrected.

3.7 No hot-air lance cleaning or crack sealing shall be performed when the pavement and cracks are wet or the ambient temperature is below 50°F (10°C).

3.8 All work shall be performed in a neat manner. The sealant shall be allowed to cool sufficiently to prevent lifting, sticking, and tracking prior to returning the pavement segment to traffic.

Method of Measurement

4.1 Hot-poured crack sealant will be measured by the pound (kilogram) of material incorporated in the work.

Basis of Payment

5.1 The accepted quantity of hot-poured crack sealant will be paid for at the contract unit price per pound (kilogram), complete in place.

5.2 Cleaning and routing will be subsidiary.

Pay item and unit:

413.1	Hot-Poured Crack Sealant	Pound (Kilogram)
413.2	Hot-Poured Crack Sealant (Low Modulus)	Pound (Kilogram)
413.3	Polyester Reinforced Mastic Crack Treatment	Square Yard (Square Meter)

SECTION 417 -- COLD PLANING BITUMINOUS SURFACES

Description

- 1.1 This work shall consist of the removal of existing bituminous pavement, by planing or milling type equipment, to the depth and grade shown on the plans or ordered.
- 1.2 This work shall also consist of removing existing rumble strips.

Equipment

- 2.1 Equipment used for planing of bituminous surfaces shall be a power-operated rotary planing or milling machine capable of uniformly removing the existing bituminous surfaces.

Construction Requirements

3.1 The existing bituminous surface shall be removed by a planing or milling machine capable of removing, in one or more passes, bituminous material to the depth specified. The equipment shall be capable of accurately establishing profile grades by an automatic grade control system referencing from either the existing pavement or from an established independent grade line.

3.1.1 The equipment shall have an effective means for controlling dust.

3.2 Material removed during this operation shall be transported and stockpiled for use or as directed.

3.3 When performing night operations, the Contractor shall provide sufficient lighting at the work site to ensure the same degree of accuracy in workmanship and conditions regarding safety as would be obtained in daylight.

3.4 **Rumble Strips.** Existing centerline and shoulder rumble strips scheduled for overlay shall be treated to eliminate their effects on the new pavement surface. Shoulder rumble strips on roadways receiving a full-width leveling or binder course prior to wearing course will not require any treatment, but centerline rumble strips will still require treatment.

3.4.1 Rumbles shall be removed prior to direct placement of the overlay by milling the full depth and width of the rumble strip.

3.4.2 In cases where the eliminated rumble strip will not be immediately overlaid, as for long-term temporary lane changes for routing detour traffic, the rumbles will be milled to a depth of one inch. The milled area shall be inlayed to match the existing pavement surface with hot bituminous pavement (hand method).

Method of Measurement

4.1 Cold planing bituminous surfaces, as shown on the plans or as ordered, will be measured by the square yard (square meter) as determined by the actual surface measurements of the lengths and widths of the bituminous areas removed.

The nominal depth of material removed will be as shown on the plans.

124

4.2 Cold planing existing rumble strips will not be measured, but shall be by the linear foot (linear meter) pay quantity in accordance with 109.11 for lengths shown on the plans.

4.2.1 The nominal depth of material removed will be as shown on the plans.

4.3 Cold planing existing rumble strips, 1" depth, as required in 417.3.4.2, will be measured by the linear foot (linear meter) to the nearest one tenth of a foot (meter) of roadway as specified by the item. Each rumble strip will be measured longitudinally along the traveled way.

Basis of Payment

5.1 The accepted quantities of cold planing of bituminous surfaces to the nominal depth specified will be paid for at the contract unit price per square yard (square meter).

5.1.1 Project lighting or overtime required due to night operations will be subsidiary to the cold planing.

5.2 Cold planing existing rumble strips is a final pay quantity item and will be paid for at the contract unit price per linear foot (linear meter) in accordance with 109.11.

5.3 The accepted quantity of cold planing existing rumble strips, 1" depth, will be paid for at the contract unit price per linear foot (linear meter) as specified by the item.

5.3.1 Inlayed pavement shall be paid under Item 403.12, Hot Bituminous Pavement, Hand Method.

Pay item and unit:

417.	Cold Planing Bituminous Surfaces	Square Yard (Square Meter)
417.19	Cold Planing Bituminous Surfaces (Night)	Square Yard (Square Meter)
417.51	Cold Planing Existing Rumble Strips (F)	Linear Foot (Linear Meter)
417.52	Cold Planing Existing Rumble Strips, 1" Depth	Linear Foot (Linear Meter)

125

4/23/09

SSD: 10/21/97, 11/24/98

CONCORD
13742C

August 3, 2009

SPECIAL PROVISION

AMENDMENT TO SECTION 401 -- PLANT MIX PAVEMENTS - GENERAL

Amend the second sentence of 2.2.1 to read:

On this project the grade of bituminous material to be used shall be PG 64-28.

126

1/11/1999

401

CONCORD
13742C

August 5, 2009

SPECIAL PROVISION

AMENDMENT TO SECTION 401 -- PLANT MIX PAVEMENTS - GENERAL

Items 403.XXXX - Hot Bituminous Pavement, _____

Add to 2.5.1:

2.5.1.1 The total 20-year ESAL for the Volumetric Mix Design on this project are as follows:

All Roadways:

- The Volumetric Mix Design shall utilize a 75 gyration N design mix.

127

12/16/08

Superseded: 3/2/95

CONCORD
13742C

August 3, 2009

SPECIAL PROVISION**AMENDMENT TO SECTION 403 -- HOT BITUMINOUS PAVEMENT****Item 403.11091 – Hot Bituminous Pavement, Machine Method, Night (QC/QA – Tier 1)****Item 403.11092 – Hot Bituminous Pavement, Machine Method, Night (QC/QA – Tier 2)****Item 403.119 - Hot Bituminous Pavement, Machine Method (Night)****Item 403.129 - Hot Bituminous Pavement, Hand Method (Night)****Item 403.91109 - Hot Bituminous Pavement, 1" Base Course with Poly Fiber (Night)****Add** to Description:

1.2 This work shall consist of constructing certain bituminous pavement under a nighttime operation. The location shall be as shown on the plan or as ordered.

Add to Construction Requirements:

3.5 In accordance with the provisions of 401.3.1.4.5, the Contractor shall supply proper lighting at the bituminous concrete plant to provide for safety, testing, inspection and loading, and shall provide sufficient lighting at the work site to ensure the same degree of accuracy in workmanship and conditions regarding safety as would be obtained in daylight.

Add to Method of Measurement:

4.1.1 Hot bituminous pavement, machine or hand method (night) will be measured in the same manner as 4.1. No separate measurement will be made for lighting necessary at the plant or at the site.

Add to Basis of Payment:

5.1.1 The accepted quantity of hot bituminous pavement, machine or hand method (night) will be paid for at the contract unit price per ton (metric ton) complete in place.

5.1.2 No separate payment will be made for any costs of plant or project lighting, or overtime or night work needed due to night operations.

SUPPLEMENTAL SPECIFICATION**AMENDMENT TO SECTION 500 - STRUCTURES
AMENDMENT TO SUBSECTION 520 – PORTLAND CEMENT CONCRETE**

Amend 1.2 Table 1A to read:

1.2 Classes of concrete. The following classes of concrete are included in these specifications Table 1A - Method and Table 1B - Performance (QC/QA).

Table 1A - Classes of Concrete

Concrete Class	Minimum Expected 28 Day Compressive Strength ¹	Maximum Water/Cement Ratio ²	Entrained Air Percent	Permeability Target Value ⁶
	PSI (Mpa)			Coulombs
AAA ³	5,000 (35)	0.400	5 to 9	2000
AAA	5,000 (35)	0.444	5 to 9	
AA ³	4,000 (30)	0.400	5 to 9	2000
AA	4,000 (30)	0.444	5 to 9	2000
A	3,000 (20)	0.464	4 to 7	4000
B	3,000 (20)	0.488	3 to 6	
T	3,000 (20)	0.559	----	
F	30 ⁴ (0.2)	3.0 to 4.0 ⁵	15 to 25 ⁵	

¹ See 3.1.6 TESTING

² For mixes containing fly-ash, silica fume, slag, or any other pozzolanic or cementitious material, the water/cement ratio of the concrete mix shall be based on the water cementitious (cement + pozzolanic or cementitious material) ratio of the mix. This water to cementitious ratio shall not exceed those listed in Table 1A. The maximum water/cement ratios listed for Concrete Class B and T are for design purposes only.

³ Deck Overlays.

⁴ **Maximum** 84 day Compressive Strength for Flowable Fill, Excavatable shall not exceed 200 psi (1.4 Mpa).

⁵ These are recommended values that may be used as a starting point for a mix design that has shown ability to meet the requirements. The amount of cement shall be adjusted and fly-ash or ground granulated blast furnace slag shall be used provided the mix design meets the minimum and does not exceed the maximum compressive strength in accordance with 2.11.1.

⁶ Target values shown are for mix design approval only and are not intended for use as quality control or quality assurance requirements.

**CONCORD
13742C**

August 13, 2009

SPECIAL PROVISION

AMENDMENT TO SECTION 520 – PORTLAND CEMENT CONCRETE

Item 520.7006 - Concrete Bridge Deck (High Early Strength) (F)

Item 520.70061 - Concrete Bridge Deck (High Early Strength) (Acc. Bridge Const.) (F)

Description

This work shall consist of the placement of an approved High Early Strength (Type III) Portland cement concrete for the cast-in-place deck-end closure pours, concrete median barriers, bridge rail copings.

A proprietary concrete mix that meets the same performance requirements may also be considered for use. All provisions of 520 shall apply except as amended or modified below.

Add to 1.2

Item 520.7006 - The concrete median barriers and bridge rail copings shall utilize High Early Strength Concrete meeting one of the following two methods:

1. Design a high early strength concrete mix and obtain the Engineer's approval.
 - a. Use air-entraining, portland cement, fine and coarse aggregates, admixtures, water, and additives.
 - b. Use between 4 to 7 percent-entrained air.
 - c. Develop a mix that can attain a **7-day compressive strength of 4,000 psi.**
 - d. Develop a mix that contains shrinkage compensating additives such that there will be no separation of the closure pour concrete from the adjacent precast concrete.
 - e. Use a shrinkage-compensating additive that produces expansion in the high early strength concrete of no more than 3 percent.
2. A proprietary concrete mix that meets the same physical requirements as those stated above may be used with approval of the Engineer.

130

Item 520.70061 - The deck end closure pours shall utilize High Early Strength Concrete meeting one of the following two methods:

1. Design a high early strength concrete mix and obtain the Engineer's approval.
 - a. Use air-entraining, portland cement, fine and coarse aggregates, admixtures, water, and additives.
 - b. Use between 4 to 7 percent-entrained air.
 - c. Develop a mix that can attain a **6-hour compressive strength of 2,000 psi and a 12-hour compressive strength of 3,000 psi.**
 - d. Develop a mix that contains shrinkage compensating additives such that there will be no separation of the closure pour concrete from the adjacent precast concrete.
 - e. Use a shrinkage-compensating additive that produces expansion in the high early strength concrete of no more than 3 percent.
2. A proprietary concrete mix that meets the same physical requirements as those stated above may be used with approval of the Engineer.

Add to Materials

2.1.1.1 Portland Cement used for High Early Strength Concrete shall be Type III conforming to AASHTO M 85 or M 240 as appropriate, unless otherwise shown on the plans or permitted. Mill test Reports shall be furnished with each delivery of cement.

Amend 3.9.2. to read:

3.9.2.1 Concrete for the cast-in-place deck end closure pours shall be finished as described in 3.9.1.1. The top of the cast-in-place deck shall receive a light broom finish perpendicular to the direction of traffic.

3.9.2.2 Blank

3.9.2.3 Blank

3.9.2.4 Blank

Amend 3.10.1 to read:

3.10.1 All exposed surfaces of concrete, except Class F, Flowable Fill and High Early Strength Concrete, shall be cured in accordance with the requirements of Table 9. All water used to wet cure concrete shall conform to 2.5. Failure to cure concrete by an approved method shall be cause for rejecting the work.

The cast-in-place deck end closures pours shall receive a wet cure utilizing water retaining material for at least 12 hours. Water retaining material shall be burlap conforming to 2.6.1, cotton mats conforming to 2.6.4 or other approved water retaining material. Water retaining material shall be kept wet for the entire cure period. Apply water retaining material in accordance with 3.10.2. During the cure period, the water retaining material shall be kept continuously wet by means of an approved automatic sprinkling or wetting system.

Add

3.11.1.3 Forms supporting the deck end closure pours shall not be removed until the end of the 12 hour curing period.

Amend 3.11.2.1 Table 10 – Concrete Loading:

The deck end closure pour concrete shall obtain 3,000 psi design strength prior to use by legal traffic loads. A portable compression testing machine shall be provided by the Contractor and available on site for cylinder testing. All testing and equipment shall conform to ASTM C39. NOTE: This compression machine must be calibrated in accordance with the provisions of Section 5, ASTM C39.

Add to Basis of Payment

5.1.1 The cost of development and testing of alternate mix designs for High Early Strength Concrete will be subsidiary to the item.

Add to Basis of Payment Pay items and unit:

520.7006	Concrete Bridge Deck (High Early Strength) (F)	Cubic Yard
520.70061	Concrete Bridge Deck (High Early Strength) (Acc. Bridge Const.) (F)	Cubic Yard

August 13, 2009

SPECIAL PROVISION**AMENDMENT TO SECTION 528 – PRESTRESSED CONCRETE MEMBERS****Item 528.62– Precast Concrete Deck Panels, Post-Tensioned (F)****Description**

This special provision provides for full depth precast concrete deck panels with bonded longitudinal post-tensioning and contents of this special provision apply to this item only. All provisions of 528 shall apply except as amended or modified below.

Add to 1.1

1.1.2 This work shall also include the design, detailing, furnishing, post-tensioning and grouting of tendons and all appurtenances required to complete a longitudinally post-tensioned system where indicated on the plans.

1.1.3 Terms. Wherever in this specification or in other contract documents the following terms are used, the intent and meaning shall be interpreted as follows:

POST-TENSIONING- The application of compressive force to the concrete by stressing tendons after the concrete has been cast and cured. The force in the stressed tendons is transferred to the concrete by means of anchorages.

POST-TENSIONING LAYOUT- The pattern, size, and locations of post-tensioning tendons provided in the plans.

POST-TENSIONING SYSTEMS- A proprietary system where the necessary hardware (anchorages, confining reinforcing, wedges, strands) is supplied by a particular manufacturer or manufacturers of post-tensioning components.

TENDONS- A high strength steel member made up of a number of prestressing strands or wires in a metal or plastic duct.

STRAND- an assembly of several high strength steel wires wound together. Strands usually have six outer wires helically wound around a single straight wire of similar diameter.

WIRE- A single, small diameter, high strength steel element and, normally, the basic component of strand, although some proprietary post-tensioning systems are made up of individual or group of single wires.

ANCHORAGE- An assembly of various hardware components, including confining reinforcement, which secure a tendon and its ends after it has been stressed and imparts the tendon force into the concrete.

WEDGES- A small conically shaped steel component placed around a strand to grip and secure it by wedge action in a tapered hole through a wedge plate.

WEDGE PLATE- A steel component of the anchorage containing a number of tapered holes through which the strands pass and are secured by conical wedges.

SET (ALSO ANCHOR SET OR WEDGE SET)- Set is the total movement of a point on the strand just behind the anchoring wedges during load transfer from the jack to the permanent anchorages. Set movement is the sum of slippage of the wedges with respect to the anchorage head and elastic deformation of the anchor components.

ANTICIPATED SET- Anticipated set is that set which was assumed to occur in the design calculation of the post-tensioning forces immediately after load transfer.

MEMBER- Member shall be considered to mean the concrete which is to be post-tensioned.

Revise 2.9 to read:

2.9 Grout for Transverse Shear Keys

Revise 2.10 to read:

2.10 Post-tensioned systems

2.10.1 Post -Tensioning Strands shall conform to 2.4.

2.10.2 Post -Tensioning Bars shall conform to the requirements of AASHTO M 275M/M 275-00 (ASTM A722/A 722M-98).

2.10.3 Anchorages. All anchorage devices shall meet the requirements of Section 10.3.2 of the AASHTO LRFD Bridge Construction Specifications, 2nd Edition, and latest interims.

2.10.4 Post-Tensioning ducts. All post-tensioning ducts shall meet the requirements of Section 10.8 of the AASHTO LRFD Bridge Construction Specifications, 2nd Edition, and latest interims.

2.10.5 Grout for Bonded Post-Tensioning. Grout shall be prebagged and of a variety specifically detailed for use in the grouting of post-tensioning ducts. The grout shall meet or exceed the specified physical properties stated herein as determined by the following standard and modified test methods. Grouts shall contain no aluminum powder.

Property	Test Value	Test Method
Total Chloride Ions	Max. 0.08% by weight of cementitious material	ASTM C 1152
Fine Aggregate (if utilized)	Max Size < No. 50 Sieve (300 micron)	ASTM C 33
Volume Change @ 24 hrs and 28 days	0.0% Shrinkage @ 24 hours <=0.3% Expansion @ 28 days	ASTM C 1090 *
Expansion	<= 2.0% for up to 3 hours	ASTM C 940
Compressive Strength @ 28 days (Average of 3 cubes)	>= 5000 psi	ASTM C 942
Initial Set of Grout	Min. 3 hours Max. 12 hours	ASTM C 953
Fluidity Test** Efflux Time from Flow Cone		
(a) Immediately after mixing	Min. 20 sec. Max. 30 sec.	ASTM C 939
	or Min. 9 sec. Max. 20 sec.	ASTM C 939***
(b) 30 minutes after mixing with remixing for 30 sec.	Max. 30 sec.	ASTM C 939
	or Max. 30 sec.	ASTM C 939***
Bleeding @3 hours	Max. 0%	ASTM C 940****
Permeability @ 28 days	Max. 2500 coulombs at 30V for 6 hours	ASTM C 1202
Freeze/Thaw durability	Relative dynamic E > 95%	AASHTO T 161 Procedure A

- * Modify ASTM C 1090 to include verification at both 24 hours and 28 days.
- ** Adjustments to flow rates will be achieved by strict compliance with the manufacturer's recommendations.
- *** Grout fluidity shall meet either the standard ASTM C 939 flow cone test or the modified test described herein. Modify the ASTM C 939 test by filling the cone to the top instead of the standard level. The efflux time is the time to fill a one-liter container placed directly under the flow cone.
- **** Modify ASTM C 940 to conform to the wick induced bleed test described below.
- Condition dry ingredients, mixing water, prestressing strand and test apparatus overnight at 75 to 80° F.
 - Insert 800 ml of mixed conditioned grout with conditioned water into the 1,000 ml graduated cylinder. Mark the level of the top of the grout.

135

- c) Wrap the strand with 2-inches wide duct or electrical tape at each end prior to cutting to avoid splaying of the wires when it is cut. Degrease (with acetone or hexane solvent) and wire brush to remove any surface rust on the strand before temperature conditioning. Insert completely a 20-inch length of conditioned, cleaned, ASTM A 416 seven wire strand (0.5 inch diameter) into the 1,000 ml graduated cylinder (possibly using a centralizer). Mark the level of the top of the grout.
- d) Store the mixed grout at the temperature range listed above in (a).
- e) Measure the level of the bleed water every 15 minutes for the first hour and hourly afterward for three hours.
- f) Calculate the bleed water, if any, at the end of the three hour test period and the resulting expansion per the procedures outlined in ASTM C 940, with the quantity of bleed water expressed as a percent of the initial grout volume. Note if the bleed water remains above or below the top of the grout.

2.10.5.1 Grouts shall be prebagged in plastic lined or coated bags. Stamp grout bags with date of manufacture, lot number and mixing instructions. Any change of materials or material sources requires retesting and certification of the conformance of the grout with the physical properties requirements. A copy of the Quality Control Data Sheet for each lot number and shipment sent to the job site shall be provided to the contractor by the grout supplier and furnished to the Engineer. Prebagged grout with clumps will be rejected.

2.10.5.2 Materials with a total time from manufacture to usage in excess of six months shall be retested and certified by the supplier before use or shall be removed and replaced.

2.10.5.3 Manufacturers of post-tensioning grout seeking qualification of their product shall provide certified test reports from an audited and independent Cement Research Laboratory (CCRL) which shows the material meets all the requirements specified herein.

Add to Construction Requirements:

3.1.7 Post-Tensioning

3.1.7.1 The post-tensioning system shall provide a minimum compressive force of 250 psi at transverse joints between panels or force detailed in the plans. Any 7-wire strand post-tensioning system that conforms to this specification can be considered for use. The requirements of a system shall include the furnishing and installing of all appurtenant items necessary for the particular stressing system used, including but not limited to ducts, anchorage assemblies, grout, and supplementary steel reinforcing bars for bursting and crack control behind anchorage assemblies and for duct support.

3.1.7.2 Shop Drawings: Shop drawings shall conform to the requirements in 3.4 and additional requirements below.

136

1. Show fully and accurately detailed blockouts, notches, recesses, projections, and the like that might be required by the Contractor's construction scheme.
2. Details of mild steel reinforcing shall be clearly shown as to size, spacing, and location including all special reinforcing required but not shown on the Contract Plans. No separate payment will be made for special reinforcement required to accommodate the Contractor's method of construction.
3. Show size and type of ducts for all post-tensioning tendons with their horizontal and vertical profiles clearly detailed. Duct supports, grout tubes, and vents shall be shown including type, size, and location, including the elements to be installed in the cast-in-place pier diaphragms.
4. Details and locations of all other items to be embedded in the girder such as inserts, post-tensioning hardware, conduit penetrations, and the like shall be shown.
5. Details of the anchorage system including confinement reinforcement required for the post-tensioning system shall be shown.
6. A table giving jacking sequence, jacking forces, and initial elongation of each tendon for all post-tensioning shall be provided to Engineer at least 10 days prior to stressing operation.
7. The Contractor shall prepare and submit integrated drawings showing all embedded items such as post-tensioning ducts, anchorages, anchorage reinforcement, blockouts, reinforcing steel. These drawings shall be to scale, shall be accurate, and shall have sufficient detail to show the relative positions of all items and their embedded depth. The drawings shall be adequate to ensure that there will be no conflict between the planned positions of the embedded items and that the concrete cover will be adequate. In the event of conflicts between post-tensioning hardware and reinforcement, the location and details of post-tensioning hardware takes precedence over the location of mild steel reinforcement. The Engineer shall review such revisions before work on any affected item is started.
8. Provide details and a complete description of the post-tensioning system to be used. Stressing details shall include method, sequence, and procedure of prestressing and securing tendons; release procedures and equipment; and sizes and properties of tendons, anchorage plates, anchorage assemblies, reinforcement, and equipment.
9. Data sheets for prebagged grout for post-tensioning tendons, method of mixing and detailed grouting procedure, equipment description and capacity (including standby flushing equipment). Details to be included in grouting procedures shall include, but is not limited to, intended direction of grouting, low point from which grouting will be injected, and sequence of closing vents.
10. Qualifications of the post-tensioning and grouting personnel. One member of the crew completing the work (superintendent or foreman) shall have attended

the American Segmental Bridge Institute (ASBI) Grouting Certification Training Program and shall be ASBE Certified Grouting Technicians.

11. Furnish test and verification data as called for elsewhere in this Section.
12. Certified Reports: Submit the following certified test reports prepared by a reputable nationally recognized independent testing laboratory:
 - a) Test reports on static pullout bonding strength of the corrugated ducts.
 - b) Certified calibration charts shall be furnished with each jack and gauge used.
 - c) Certified copies of test results for the post-tensioning anchorage. Anchorage shall be so arranged that the jacking force in the tendon may be verified prior to removal of the stressing equipment.
 - d) Test reports of tendon modulus of elasticity, ultimate tensile strength, yield strength, elongation, composition, and in place friction tests if required.
13. Stressing Records: The Contractor is responsible for all stressing records including gauge pressure and elongation for each tendon stressed. The stressing logs shall be submitted to the Engineer daily for review and the Contractor shall reconcile the differences with calculated values of all individual tendons and groups of tendons, prior to next load transfer erection operation or on a weekly basis. The Contractor shall submit a system of tendon identification, individually and in groups, to expedite the tasks of the Contractor and the Engineer in mutual pursuit of the installation and acceptance of the post-tensioning process. Grout logs as called for elsewhere in this Section.

3.1.7.3 Design Computations: Four (4) sets of design computations for the proposed method of post-tensioning shall be submitted for approval with the shop drawings. The design computations shall be signed and sealed by a licensed professional engineer, registered in the State of New Hampshire, and shall include but not be limited to the following information:

1. Computed losses for each tendon such as creep and shrinkage of concrete, elastic shortening, relaxation of steel, losses in post-tensioned prestressing steel due to sequence of stressing, friction and take up of anchorages, and other losses peculiar to the method or system of prestressing that may take place or have been provided for.
2. Jacking force for each tendon.
3. Effective force for each tendon.
4. Anchorage bearing stress at service load.

5. All other computations required for the system of stressing being used, including all reinforcing required to resist bursting stresses. Post-tensioned anchorage zones shall conform to the requirements of Section 5.10.9 of the AASHTO LRFD Bridge Design Specifications.

3.1.7.4 Post-Tensioning Anchorages: All prestressing steel shall be secured at the ends by means of permanent type anchoring devices that have been reviewed and accepted by the Engineer. The anchorages shall meet or exceed the following requirements:

1. The anchorages shall develop at least 95 percent of the minimum specified ultimate tensile strength of the prestressing steel, tested in an unbonded state without exceeding anticipated set. Certified copies of test results for the anchorage system to be used shall be supplied to the Engineer at no additional cost. The anchorage shall be so arranged that the prestressing force in the tendon may be verified prior to removal of the stressing equipment.
2. The load from the anchoring device shall be distributed to the concrete by means of approved devices that will effectively distribute the load to the concrete. Such devices shall conform to the following requirements:
 - a) The average bearing stress in the concrete created by the anchorage plates shall not exceed the values in Section 9.2.1 and 14.0 of Division I and Section 4.2 of Division II of the 1999 AASHTO Guide Specifications for Design and Construction of Segmental Concrete Bridges.
 - b) Bending stresses in the plates or assemblies induced by the jacking of the prestressing steel shall not exceed the yield point of the material in the anchorage plate when 95 percent of the ultimate strength of the tendon is applied or cause visible distortion of the anchorage plate, as determined by the Engineer.
3. Should the Contractor elect to furnish an anchoring device of a type which is sufficiently large and which is used in conjunction with a steel grillage embedded in the concrete that effectively distributes the compressive stresses to the concrete, the steel distribution plates or assemblies may be omitted.
4. Anchorages must be set in a plane normal to the axis of the tendons such that uniform bearing on the concrete is assured. Wedge-type anchors shall not be used in inaccessible locations.

Anchorage shall be supplied with a steel reinforcing spiral for those tendons having a prestressing force greater than 300 kips.

5. Anchorages shall be protected as follows:
 - a) The anchoring devices shall be recessed so the ends of the post-tensioning steel and all parts of the anchorage will have at least two inches of cover from the panel's surface. The recess shall be filled with a qualified non-shrink grout following post-tensioning.

- b) Anchorage blisters may be required to accommodate the anchorage assemblies and the clear cover requirement. The Contractor can fabricate the end panels with the anchorage assemblies and anchor blocks already installed or can install the anchorage assemblies and fill the anchorage blisters with non-shrink grout, on-site, after the panels have been erected.
 - c) As soon as possible, but not exceeding 14 days after post-tensioning is complete, exposed end anchorages, strands and other metal accessories shall be cleaned of rust, misplaced mortar, grout and other deleterious materials. Immediately following the cleaning operation, the entire surface of the anchorage recess (all metal and concrete) shall be thoroughly dried and uniformly painted with an epoxy bonding compound conforming to AASHTO M235, Type II, in accordance with the manufacturer's recommendations. The anchorage recess shall be filled with a non-shrink cement based grout immediately following the application of the epoxy-bonding compound.
6. Local zone reinforcement, required for the performance of the anchorage (based on previous tests and history of successful performance on other projects) shall be provided by the Contractor incidental to the proprietary anchorage system selected.
7. All anchorages shall be provided with a permanent non-metallic grout cap with gasket that fully encapsulates the wedge plate. The grout cap shall be durable and impervious, and shall protect the strands from corrosion. Temporary grout caps will not be permitted.

3.1.7.5 Samples for Testing:

1. The following samples of materials and devices selected at locations designated by the Engineer shall be furnished by the Contractor at Contractor's expense. The Engineer shall be present at the time of sampling. The Contractor shall notify the Engineer at least 24 hours in advance of when samples will be taken from stored materials.
 - a) Three 7-foot long samples of prestressing wire or bar for each size from each heat number or production lot.
 - b) Three 7-foot long samples of prestressing strand for each size from each heat number or production lot.
 - c) If bar couplers are to be used, three samples with two specimens each consisting of four foot lengths of the specific prestressing bar coupled with a bar coupler from the materials to be used on the project.
 - d) One unit of each prestress anchorage to be used on the project.
 - e) Samples shall be taken at least 30 days in advance of the time they are to be incorporated into the Work.

2. All strands from each manufactured reel to be shipped to the site shall be assigned an individual lot number and shall be tagged in such a manner that each such lot can be accurately identified at the job site. Each lot of anchorage assemblies to be installed at the job site shall also be identified in a similar manner. All unidentified prestressing steel and anchorage assemblies received at the site will be rejected and loss of positive identification of these items at any time will be cause for rejection of their use as intended.
3. The release of any material by the Engineer shall not preclude subsequent rejection if the material is damaged in transit or later damaged or found to be defective.

3.1.7.6 Testing by Contractor:

1. The Contractor shall furnish manufacturer's certified reports covering die tests required by these specifications. A certified test report stating the guaranteed minimum ultimate tensile strength, yield strength, elongation, and composition shall be furnished for each lot of prestressing steel. Typical stress-strain curves for prestressing steel shall be furnished. A certified test report stating strength when tested using the type prestressing steel to be used in the Work shall be furnished for each lot of prestress anchorage devices.

3.1.7.7 Protection of Prestressing Steel:

1. During and after prestressing steel installation the Contractor shall prevent all water, rain, snow and/or ice from entering the post-tensioning ducts.
2. When acceptable prestressing steel for post-tensioning is installed in the ducts after completion of concrete curing, and if stressing and grouting are completed within ten calendar days after the installation of the prestressing steel, rust which may form during said ten days will not be cause for rejection of the steel, provided no pitting has developed over this period. Prestressing steel installed, tensioned and grouted in the manner, all within ten calendar days, will not require the use of corrosion inhibitor in the duct following installation of the prestressing steel. Post-tensioning steel installed as above but not grouted within ten calendar days shall be subject to all the requirements in this section pertaining to corrosion protection, which includes an accepted water soluble corrosion inhibitor and may include rejection because of rust. The corrosion protection system shall be submitted for review and approval prior to the start of any post-tensioning work. Vapor Phase Inhibitor (VPI) is not an acceptable corrosion protection system. The submission for approval shall include certified test reports from an audited and independent research laboratory which indicates the proposed corrosion inhibitor will provide corrosion protection in accordance with the provisions of Federal Specifications MIL-P-3420. Bond testing shall be also performed to prove that the proposed corrosion inhibitor does not impair the bond strength between the cement grout and prestressing steel. Appropriate ventilation is required to avoid toxic effects.

3.1.7.8 Post-tensioning ducts:

1. The inside diameter of the ducts shall be at least $\frac{1}{4}$ " larger than the nominal diameter of single wire, bar, or strand tendons, or in the case of multiple wire, bar, or multiple strand tendons, the inside cross-sectional area of the sheathing shall be at least two times the net area of the prestressing steel. When tendons are to be placed by the pull through method, the duct area shall be at least $2\frac{1}{2}$ time the net area of the prestressing steel.
2. Transition couplings connecting ducts to anchoring devices shall be galvanized ferrous metal and shall be capable of positively preventing the entrance of cement paste and water from concrete and of sufficient strength to prevent distortion or displacement of the ducts during concrete placement.
3. Splices in ducts used at the cast-in-place concrete diaphragms shall be the same material as used in the members. Joints between the portion of duct protruding from the end of the members and the splice section shall be capable of positively preventing the entrance of cement paste and water from concrete and of sufficient strength to prevent distortion or displacement of the ducts during concrete placement. Duct tape is not considered adequate.
4. Ducts shall be security tied in position, carefully inspected, and repaired before placing of the concrete is started, and care shall be exercised during the placing of the concrete to avoid displacing or damaging the ducts. Metal ducts shall be supported at intervals of not more than 4 feet. Plastic ducts shall be supported at intervals of not more than 2 feet. The tolerance on the location of the tendons shall be plus or minus 0.25 inches at any point and in any direction. Visual inspection shall be used to confirm a smooth profile with no kinks prior to closing forms.
5. After installation in the forms and bulkheads, the ends of the ducts shall be sealed at all times to prevent entry of water and debris. Following concrete placement, the Contractor shall demonstrate to the Engineer that all empty ducts are free of water and are unobstructed and undamaged. Immediately prior to installation of the prestressing steel, the Contractor shall again demonstrate to the Engineer that all ducts are unobstructed and that they are free of water and debris. An acceptable method of demonstrating that the ducts are unobstructed and free of water and debris is to blow oil-free compressed air through the full length of each duct.

3.1.7.9 Vent and Grout Injection Pipes:

1. All ducts and anchorage assemblies for permanent prestressing shall be provided with pipes or other suitable connections at each end and each side of couplers for injection of grout after post-tensioning. In addition all ducts having a tendon profile varying in elevation by more than six inches shall be vented at all high points of the tendon profile and drained at all low points in the tendon profile. In addition, grout vents shall be placed from 3'-6' either side of the high point of the tendon. Any segment of the tendon profile that is horizontal at a high point will have a grout vent placed at no greater than 50 ft increments. Vents and drains shall be $\frac{3}{4}$ " minimum diameter standard pipe or

suitable plastic pipe. Waterproof tape shall be used at all connections including vent and grouting pipes. Plastic components shall not react with the concrete or enhance corrosion of the prestressing steel, and shall be free of water-soluble chlorides. The vents shall be mortar tight, taped as necessary, and shall provide means for injection of grout through the vents and for sealing the vents. At all times, pipes shall be capped with water tight plastic caps specifically provided by the post-tensioning supplier, and shall be protected from damage by pedestrian, vehicle and equipment traffic. Any damage to the pipe or cap shall be immediately repaired and misplaced caps shall be immediately replaced.

2. Grout injection pipes shall be fitted with positive mechanical shut-off valves. Vents and injection pipes shall be fitted with valves, caps, or other devices capable of withstanding the pumping pressures specified herein.

3.1.7.10 Strand Installation

1. Strands shall be installed in the ducts so as to avoid entanglement and excessive slack. The placement should be such that would allow a linear elongation of the tendons when jacking from 20% to 100% of the jacking force.
2. During and after prestressing steel installation, the Contractor shall prevent all water, rain, snow, and ice from entering the prestressing ducts.

3.1.7.11 Post-Tensioning

3.1.7.11.1 Qualifications of the Stressing and Grouting Contractor:

The stressing and grouting of post-tensioning tendons shall be performed by personnel with appropriate qualifications and experience. The company responsible for stressing and grouting operations shall be a member of the Post-Tensioning Institute, in the "Post-tensioning Company" membership category. In addition, the field personnel assigned to the project shall meet the following minimum qualifications and experience requirements:

Project Superintendent / Manager

This Project Superintendent/Manager should have either a minimum of ten years of bridge construction experience or be a registered Professional Engineer with five years of bridge construction experience in which three years is in post-tensioned concrete construction. Experience should include post-tensioning and grouting operations including at least one year in responsible charge of post-tensioning related operations.

Foreman

The Foreman should have a minimum of five years bridge construction experience including two years in post-tensioning related operations and a minimum of one year as a foreman in responsible charge of post-tensioning related operations.

Crews for Tendon Installation and Stressing

The Crew Foreman should be certified according to the "Post-Tensioning Training Course" of the Post-Tensioning Institute (PTI), or other equivalent and recognized alternative course acceptable to the Engineer. In addition, the crew foreman should have three years job-site experience in post-tensioning operations. At least one, preferably two, other members of the crew should be likewise certified but need not necessarily have job-site experience.

Crews for Tendon Grouting

The Crew Foreman should be certified according to the "Grouting Certification Training Course" of the American Segmental Bridge Institute (ASBI), or other equivalent and recognized alternative course acceptable to the Engineer. In addition, the crew foreman should have three years job-site experience in the grouting of post-tensioning tendons. At least one, preferably two, other members of the crew should be likewise certified but need not necessarily have job-site experience.

3.1.7.11.2 Stressing Tendons:

1. All post-tensioning steel shall be tensioned by means of hydraulic jacks so that the force of the prestressing steel shall not be less than the value shown on the approved working drawings. The maximum temporary tensile stress (jacking stress) in prestressing steel shall not exceed 80 percent of the specified minimum ultimate tensile strength of the prestressing steel. The prestressing steel shall be anchored at stresses (initial stresses) that will result in the ultimate retention of permanent forces of not less than those shown on the approved drawings, but in no case shall the initial stress, after anchor set, exceed 70 percent of the specified minimum ultimate tensile strength of the prestressing steel. Permanent force and permanent stress will be considered as the force and stress remaining in the prestressing steel after all losses, including creep and shrinkage of concrete, elastic shortening of concrete, relaxation of steel, losses in post-tensioned prestressing steel due to sequence of stressing, friction and take-up of anchorages, and all other losses peculiar to the method or system of prestressing have taken place or have been provided.
2. A qualified representative of the post-tensioning system manufacturer who is skilled and experienced in the proposed work shall be on site during all stressing operations. The representative shall be available for (a) inspecting and approving all post-tensioning hardware installation prior to concrete placement; (b) stressing and anchoring tendons; (c) grouting operations.
3. Each jack used to stress tendons shall be equipped with a pressure gauge for determining the jacking pressure. The pressure gauge shall have an accurately reading dial at least six inches in diameter and each jack and its gauge shall be calibrated as a unit with the cylinder extension in the approximate position that it will be at final jacking force prior to stressing the initial tendon. Certified calibration charts shall be furnished by an independent laboratory with each jack and gauge used on the project. Certified calibration

shall be made at the start of the work and every six months thereafter, or as requested by the Engineer. The calibration shall be done while the jack is in the identical configuration as will be used on the site, e.g., same length hydraulic lines. At the option of the Contractor, calibrations subsequent to the initial ram calibration by the load cell may be accomplished by the use of a master gauge. The master gauge shall be supplied by the Contractor in a protective waterproof container capable of protecting the calibration of the master gauge during shipment to a laboratory. The Contractor shall provide a quick-attach coupler next to the permanent gauge in the hydraulic line, which enables the quick and easy installation of the master gauge to verify the permanent gauge readings. The master gauge shall remain in the possession of and be calibrated by the Engineer for the duration of the project. Any repair of the rams, such as replacing the seals or changing the length of the hydraulic lines, is cause for recalibration of the ram with a load cell. No extra compensation will be allowed for the initial or subsequent ram calibrations or for the use and required calibrations of a master gauge.

4. Post-tensioning forces shall not be applied until the concrete has attained the compressive strength specified as determined by the cylinder tests.

5. The tensioning process shall be so conducted that tension being applied and the elongation of the post-tensioning steel may be measured at all times. A record shall be kept of gauge pressures and elongations at all times and shall be submitted to the Engineer. The post-tensioning force may be verified as deemed necessary by the Engineer. The tendon force measured by gauge pressure shall agree within seven percent of the theoretical elongation. The entire operation shall be checked and the source of error determined and remedied to the satisfaction of the Engineer before proceeding with the work. Elongations shall be measured to the nearest 1/8 in. Equipment for tensioning the tendons must be furnished by the manufacturer of the system (tendons and Contractor, may require additional bench tests and/or friction tests, should the agreement between pressure gauge readings and measured elongations fall outside the acceptable tolerances.

6. The Contractor shall submit computations showing tendon forces and elongations after friction, wobble, and anchor set losses. Losses shall be based on expected modulus of elasticity and actual friction and wobble coefficients and anchor set losses for the system to be used. These parameters shall also appear on the shop plans for all different tendon types.

7. Tendons shall be stressed in the sequence shown on the approved shop drawings. The stressing sequence shall be such that not more than one tendon will be eccentric about the centerline of a member at any time.

8. The Contractor shall take all necessary provisions to avoid crushing of vacant adjacent ducts during the stressing operations.

9. Prestressing steel shall be cut by an abrasive saw within 0.75 to 1.5 inches away from anchoring device. Flame cutting of prestressing steel is not allowed.

10. Within four hours after stressing, protect tendons against corrosion or harmful effects of debris, by temporarily plugging or sealing all opening and vents. Clean rust and other debris from all metal surfaces, which will be covered by the grout cap, and place the permanent nonmetallic grout cap with gasket over the wedge plate.

3.1.7.11.3 Grouting post-tensioning ducts:

1. After the tensioning of all tendons has been completed and the prestressing steel has been anchored, the annular space between the duct and the tendons shall be completely filled with grout. The tendons shall be protected against corrosion by a plug at each end to prevent the passage of air, and such plugs shall be left in place until the tendon is grouted. A pressure test on the duct shall be performed prior to the grout procedure. Duct should be able to achieve 30 psi pressure. Test should not raise pressure greater than 40 psi with closed vents and temporary grout caps.

2. The grouting equipment shall include a colloidal grout mixer capable of continuous mechanical mixing which will produce a grout free of lumps and undispersed cement. The equipment shall be able to pump the mixed grout in a manner which will comply with all provision hereinafter specified. Graduated measuring equipment shall be used for accurate liquid measurement. The pumps shall be positive displacement type and be able to produce an outlet pressure of at least 150 psi. The pump shall have seals adequate to prevent introduction of oil, air, or other foreign substance into the grout, and to prevent loss of grout or water. A pressure gauge having a full-scale reading of no greater than 300 psi shall be placed at some point in the grout line between the pumping outlet and the duct inlet. The grouting equipment shall contain a screen having clear openings of 0.125-inch maximum size to screen the grout prior to its introduction into the grout pump. If a grout with an additive is used, a screen opening of 0.188 inch is satisfactory. This screen shall be easily accessible for inspection and cleaning. The grouting equipment shall utilize gravity feed to the pump inlet from a hopper attached to and directly over it. The hopper must be kept at least partially full of grout at all times during the pumping operation to prevent air from being drawn into the post-tensioning duct. Under normal conditions, the grout equipment shall be capable of continuously grouting the longest tendon on the project in not more than twenty minutes.

3. Provide back up grouting equipment and independent back up power supply to ensure that grout placement can continue if primary equipment or power supply fails.

4. Mix the grout in accordance with the manufacturer's instructions using a colloidal mixer to obtain a homogenous mixture. Perform a fluidity test on the

mixed grout, in accordance with the grout material specifications, prior to beginning the injection process. Obtain target flow rates as a function of mixer type used and ambient temperature from the grout manufacturer. Do not begin the grouting process until the proper grout properties have been obtained.

5. Batches shall be placed within 30 minutes of mixing.

6. All grout openings and high point vent openings shall be open when grouting starts. Grout shall be allowed to flow from the first vent after the inlet pipe until all residual flushing water and entrapped air has been removed, at which time the vent shall be capped or otherwise closed. Remaining vents shall be closed in sequence in the same manner. Maintain a continuous flow of grout at a rate not to exceed 30 feet of duct per minute. The pumping pressure at the tendon inlet shall not exceed 250 psi. Normal operations shall be performed at 75 psi. If the actual grouting pressure exceeds the maximum allowable pumping pressure, close the injection vent and inject the grout at the next vent, which has been, or is ready to be, closed as long as one-way flow is maintained. Do not inject grout into a succeeding vent from which grout has not yet flowed. If a one-way flow of grout cannot be maintained as outlined above, the grout shall be immediately flushed out of the duct with water.

7. Grout shall be pumped through the duct and continuously wasted at the outlet pipe until no visible slugs of water or air are ejected and efflux time of ejected grout is not less than the injected grout. Perform a fluidity test, in accordance with the grout material specifications, on each tendon measuring the grout discharged from the discharge outlet. The measured grout efflux time shall meet the requirements of the Fluidity Test listed in the grout material specifications. If the grout efflux time is not acceptable, discharge additional grout from the discharge outlet. Test grout efflux time. Continue this cycle until acceptable grout fluidity is achieved. Ensure that the tendon remains filled with grout, by closing the ejection and injection vents in sequence, respectively, under pressure when the tendon duct is completely filled with grout. Do not remove the positive shut-offs at the injection and ejection vents or open until the grout has set. At all times, the ducts shall be free of water to avoid damage due to freezing. The temperature of the concrete or air surrounding the tendon shall be 40 degrees F or higher from the time grout is placed until the minimum compressive strength of 800 psi, as determined from tests on 2 inch cubes cured under the same condition as the in-place grout, is obtained. Grout shall not be above 90 degrees F during mixing or pumping. If necessary, the mixing water shall be cooled. The waste fluid that is flushed from the duct shall be captured and disposed of in compliance with applicable laws. All grout that spills shall be collected and disposed of in compliance with applicable laws.

8. 24-hours after grouting, the level of grout in the grout inlet pipes, vent pipes, and grout caps shall be inspected and topped off as necessary with freshly mixed grout. Vacuum grouting or other remedial action may be required by Engineer based on size and extent of voids found.

9. Do not remove or open valves, caps or vent pipes until the grout has set. Ends of steel vents shall be removed at least 1 inch below the concrete surface after the grout has set. Ends of plastic vents shall be removed to 1 inch below surface of the concrete, or 1 inch below deck grade, after the grout has set. Remove all miscellaneous material used for sealing grout caps before carrying out further work to protect end anchorages or filling in anchorage pourbacks and the like. A shrinkage compensating polymer modified grout applicable for vertical patching shall be used to patch holes left from grouting procedures.

10. Daily grouting logs and cumulative record books shall be submitted to the Engineer for review and record within 72 hours of grouting. Information to be provided in the records shall include but shall not necessarily be limited to the following: tendon number, date grouted, number of days between stressing and grouting, brand of prebagged grout, tendon end used for injection, grout flow test results, grouting pressure, and summary of problems encountered and corrective action taken.

3.2.1.1.1 For precast concrete deck panels that are not pretensioned, the precast concrete manufacturing plant shall either meet the certification requirements of 3.2.1.1, or be certified by the National Precast Concrete Association. The Fabricator shall submit proof of certification prior to the start of production. The fabricator shall cast a trial panel, as required by the Engineer. All costs to manufacture the trial piece shall be subsidiary to Item 528.62.

Revise 3.22.6 to read:

3.22.6 Installation of Partial Depth Deck Panels

Add to 3.22

3.22.7 Installation of Full Depth Deck Panels

3.22.7.1 The full depth panels shall be set to the elevations detailed on the plans. Final panel elevations shall be attained by adjusting the torque on leveling screws to promote an equal distribution of panel dead load to all girders. The torque schedule shall be submitted with the shop drawings for the panels. The torque tolerance shall be +/- 15%.

3.22.7.2 Panels shall not be used to support construction loads until the bedding concrete has attained a minimum compressive strength equal to the design compressive strength of the panels.

3.22.7.3 The transverse shear keys and recesses between the precast slabs shall be thoroughly cleaned prior to delivery by means of high pressure washing using a pressure of at least 1000 psi and a delivery rate of not less than 4 gallons per minute. The shear key surface shall be cleaned on site by air blasting prior to placing the grout. If a pre-bagged non-shrink grout is used, the shear keys and recesses shall be prepared and the grout shall be placed according to the grout manufacturer's recommendations. If a cement based, non-shrink grout is used (not pre-bagged) the key areas shall be wet thoroughly prior to grout placement. The grout shall attain a minimum compressive

strength of 1500 psi (or minimum strength detailed on the plans) prior to post-tensioning the panels longitudinally.

3.22.7.4 The deck panels shall be post-tensioned prior to making them composite with the girders unless specific direction to the contrary is detailed on the plans. See post-tensioning requirements elsewhere in this special provision. Panels shall not be post-tensioned until they have aged a minimum of 45 days.

3.22.7.5 After the shear studs have been installed, bedding concrete shall be placed through the shear connector pockets in the deck panels to completely fill the area under the panels and over the flanges. Compressible foam grout dams or temporary formwork shall be used to maintain the concrete within the haunch. All leveling screws and other supplemental supports shall be removed after the bedding concrete has attained strength. Holes left by the removal of the leveling screws shall be filled with an approved non-shrink grout.

Add to Basis of Payment Pay items and unit:

528.62	Precast Concrete Deck Panels, Post-Tensioned (F)	Square Foot
--------	--	-------------

SUPPLEMENTAL SPECIFICATION**SECTION 534 – WATER REPELLENT**

This supplemental clarifies the use and application of water repellent (silane/siloxane).

Amend 1.1 to read:

1.1 A water repellent of the type specified shall be applied to the concrete surfaces shown on the plan or as ordered. Surfaces to be treated shall normally consist of the following portions of all bridges: concrete curbs, sidewalks (top, fascia, bottoms), wingwalls, piers, and abutment face walls and bridge seats when not coated with epoxy coating.

Amend 3.4 to read:

3.4 Water repellent (silane/siloxane) shall be applied at the heaviest coverage recommended by the manufacturer. Ambient application temperatures, except as allowed in sections 3.1.2 and 3.1.3, shall conform to the product application temperature listed on the Qualified Product List.

Add 3.4.3

3.4.3 The contractor shall protect the concrete surface from rust staining. Any staining that does occur shall be removed by mopping with a solution containing 1lb of oxalic acid powder per gallon of water. After 2 or 3 hours, rinse the surface with clear water, scrubbing at the same time with a stiff brush. Tough stains may require a second treatment. If rust stains still persist, other means of removal may be allowed by the Engineer. Areas that had been coated with water repellent prior to removal of rust stains shall be recoated at the application rate specified in 3.4.

Add 4.2

4.2 Water repellent used to recoat areas where rust stains were removed will not be measured for payment.

Add 4.3

4.3 The Engineer's estimated quantity of Water Repellent (Silane/Siloxane) is based on an application rate of 150 sf/gal.

Add 5.2

5.2 Removal of rust stains and recoating with water repellent will be at the Contractor's expense.

Add 5.3

5.3 The pay quantity of Water Repellent (Silane/Siloxane) shall be the actual amount used as per 534.3.4.

05/16/08

537
SS

SUPPLEMENTAL SPECIFICATION

AMENDMENT TO SECTION 537 – CONCRETE SEALER

Delete Section 537

151

5/3/07

1 of 5

Supersedes Spec. Prov. dated 7/25/97, 11/26/97, 9/16/98, 3/09/2000, 7/05/01, 2/25/03, 8/12/03
and 1/13/04

CONCORD
13742C

August 3, 2009

SPECIAL PROVISION

AMENDMENT TO SECTION 538 -- BARRIER MEMBRANE

Item 538.5 - Barrier Membrane, Welded by Torch (F)

Item 538.6 - Barrier Membrane, Welded by Torch - Machine Method (F)

Add to 1.1:

1.1.1 The Contractor shall arrange for a manufacturer's representative to be present at all times work is performed under this specification, including placement of the hot bituminous pavement overlay. The Representative shall be readily identified by a photo ID badge, issued by the manufacturer that includes the manufacturer's name and logo, a current photograph of the Representative, the Representative's full name, and the word "Representative". The text of the badge shall be clearly printed in English. The Representative shall have the badge on his/her person and available for inspection at all times work is performed under this specification.

Add 1.2:

1.2 In performing work under this specification, the Contractor shall anticipate and provide for quality assurance testing and inspection by the Engineer or his/her authorized representatives.

Amend 2.1 to read:

2.1 Barrier membrane, welded by torch, shall consist of an approved prefabricated reinforcement of synthetic non-woven material, thoroughly impregnated and coated with SBS modified bitumen as included on the Department's Qualified Products List. When machine method is specified, the membrane system shall be as listed on the Qualified Products List for Item 538.6, Barrier Membrane, Welded by Torch- Machine Method.

2.1.1 The system shall include a primer that enhances the adhesive bond between the concrete deck and the membrane, a compatible waterproof elastomeric curb sealer, and a tack coat that enhances the bond between the membrane and the hot bituminous pavement overlay. The primer and membrane shall be applied by an Applicator certified by the manufacturer. Applicators shall be individuals who have been thoroughly trained, by the manufacturer, in all aspects of application of the membrane system. Although an individual may be certified as both Applicator and Representative, the individual shall not serve in both capacities at the same time. Upon certification, the manufacturer shall issue a badge to the Applicator that includes the manufacturer's name and logo, a current photograph of the Applicator, the Applicator's full name, and the word

152

“Applicator”. The text of the badge shall be clearly printed in English. When machine method application is specified, the machine shall be operated by an Applicator certified to operate the machine. This certification shall be indicated on the Applicator’s badge. The Applicator shall have the badge on his/her person and available for inspection at all times work is performed under this specification.

2.1.1.1 The tack coat shall be applied by the certified membrane Applicator, or other contractor if approved by the manufacturer.

Amend 2.2 to read:

2.2 Hot-applied rubberized asphalt for sealing the curb line shall be a product as included on the Qualified Products List.

Add 2.3:

2.3 Quality Control

2.3.1 The Contractor shall provide a copy of the membrane manufacturer’s “Field Process Quality Control Plan”, approved by the Bureau of Materials and Research, to the Contract Administrator prior to the start of any work under this item. Field Process Quality Control Plans not previously approved shall be submitted to the Bureau of Materials and Research, at least 4 weeks prior to the start of any work under this item. The Contractor, in cooperation with the Representative and the Applicator, is responsible for ensuring that all requirements of the manufacturer’s Field Process Quality Control Plan are met.

Amend 3.1 to read:

3.1 Preparation of the surface. The concrete deck shall be cured in accordance with 520.3.10. The surface of the deck shall have a uniform fine-textured finish. In lieu of patching, surface cavities shall be ground to form a smooth transition across the deck surface as directed by the Engineer.

3.1.1 The entire deck shall be shot blasted using self-contained, self-propelled equipment to achieve a consistent anchor profile that is free of sharp protrusions. Abrasive media shall consist of a blend of shot and grit sufficient to provide an angular profile that meets the requirements of 3.1.1.2. Areas that are not accessible to self-propelled shot blasting equipment, as determined by the Engineer, shall be blasted with appropriate equipment utilizing either mineral grit or steel grit and air pressure sufficient to achieve the specified surface profile.

3.1.1.1 Suitable traps shall be installed in shot-blasting equipment to prevent foreign substances from being deposited on the surface.

3.1.1.2 The Contractor shall provide a copy of Technical Guideline No. 03732, published by the International Concrete Repair Institute including the benchmark profile coupons. The final concrete surface profile shall be between CSP 3 and CSP 5 as defined by this Guideline.

3.1.1.3 Prior to primer application, the surface shall be clean and free of laitance, oil and foreign materials. Tightly adhered membrane, which cannot be removed by scraping using heavy pressure, may be left in place. The Engineer may order pull-off tests in accordance with 3.1.2 to ensure that the remaining membrane is adequately adhered.

3.1.1.4 When membrane is to be placed over significant areas of previously placed membrane system, as determined by the Engineer, the new membrane shall be placed by hand.

3.1.2 Quality control tests for adequate tensile bond strength shall be conducted on the substrate by the Applicator in accordance with ASTM D 4541. Adhesion tests shall be performed at locations determined by, and in the presence of, the Engineer. Adhesion testing will be performed using a contractor-provided Type I or Type II fixed-alignment adhesion tester as listed on the Qualified Products List. The adhesion tester shall be calibrated annually and a copy of the calibration certification shall accompany the adhesion tester. At least one quality control test shall be conducted per 400 m² (500 yd²) of deck area, with a minimum of 3 tests per structure or deck construction phase. The Engineer may perform quality assurance adhesion testing of the substrate using a Type I fixed-alignment adhesion tester as listed on the Qualified Products List. The Engineer may require additional preparation of the substrate in any area where bond strength of at least 0.70 mPa (100 psi) is not demonstrated. In cases of conflict between adhesion testers, the Type I adhesion tester results will govern.

3.1.3 Immediately prior to application of the primer, the deck shall be cleaned by brooms and oil-free compressed air.

3.1.4 The concrete surface shall be inspected and approved by the Engineer and the Representative prior to priming.

3.1.5 The Contractor shall perform moisture testing of the deck surface using a Contractor-supplied portable electronic surface moisture meter as included on the Qualified Products List. Moisture tests shall be performed at locations determined by, and in the presence of, the Engineer. The moisture meter shall be calibrated annually and a copy of the calibration certification shall accompany the moisture meter. The primer shall only be applied when the moisture content of the substrate surface is 6 percent or less, and when the temperature of the substrate exceeds the dew point by at least 3° C (5° F). Special attention shall be given to assure that there is no moisture present at the interface between the deck and bridge curb. The air temperature and the substrate temperature shall be at least 5 °C (40 °F) and rising. The Engineer may perform additional moisture testing of the substrate.

Amend 3.2 to read:

3.2 Application of adhesive primer. The handling of components shall be performed in a safe manner to achieve the desired results in accordance with the manufacturer's Field Process Quality Control Plan.

3.2.1 The primer shall consist of one coat thoroughly covering the entire surface to be membraned with an overall coverage rate of 4.8 m²/l (200 ft²/gal) or as specified in the Field Process Quality Control Plan.

3.2.1.1 The primer shall be applied by brush, roller or sprayer.

3.2.1.2 The primer shall cure tack-free in accordance with the manufacturer's Field Process Quality Control Plan before application of the waterproofing membrane. Additional priming may be required depending on the surface conditions and the time between priming and application of the membrane.

Amend 3.3 to read:

3.3 Application of membrane. The waterproofing membrane shall be welded by torch onto the prepared substrate in accordance with the manufacturer's Field Process Quality Control Plan to assure bond with the primed surface and elimination of air bubbles. The Contractor shall be responsible for the protection of adjacent areas.

3.3.1 Membrane shall be installed in a shingled pattern so that water is permitted to drain to the low areas of the deck without accumulating against seams. Laps shall be staggered at the beginning and ends of rolls and shall overlap the previous roll and be sealed in accordance with the manufacturer's Field Process Quality Control Plan. Prior to suspension of work for any reason, all exposed edges shall be heated, troweled and sealed in accordance with the manufacturer's Field Process Quality Control Plan.

3.3.2 At the curb line, the membrane shall be torch-applied to within 25 mm (1 in) of the curb. The curb shall be protected to prevent damage or permanent discoloring of the curb. The remaining area between the edge of the membrane and the curb, including the sloped fillet below the curb, shall be completely sealed with hot-applied rubberized asphalt material meeting the requirements of 2.2. The hot rubberized asphalt material shall be applied as described in the manufacturer's Field Process Quality Control Plan to form a complete seal below the curb.

3.3.3 Damaged membrane and adhesion test locations shall be patched or repaired in accordance with the manufacturer's Field Process Quality Control Plan.

3.3.4 Prior to paving, any blisters found in the applied membrane shall be punctured with a torch-heated pick inserted at an approximate 45° angle. Blisters found subsequent to paving shall be punctured in the same manner.

155

3.3.5 The Contractor shall take all necessary precautions to eliminate damage or contamination to the membrane system by vehicular traffic or by the spillage of gasoline, oil, diesel fuel, grease, hydraulic fluid or other deleterious substance. Contaminants shall be removed in a manner described in the manufacturer's Field Process Quality Control Plan. Any material damaged by contaminants or during cleaning shall be cut out and the damaged area repaired in accordance with 3.3.3.

3.3.6 Membraned surfaces to be backfilled against shall be protected from rupture by a protection board, including horizontal surfaces of box culverts and rigid frames.

Add to 3.5:

3.5.2 Application of tack coat. The membrane to be coated shall be clean and free from loose debris, moisture, or other contaminants.

3.5.2.1 The tack coat shall be applied in accordance with the manufacturer's Field Process Quality Control Plan.

Add to 4.1:

4.1.1 Repairs to the substrate or membrane system due to testing are subsidiary to the item and will not be measured.

Add to Pay Items and Units:

538.5	Barrier Membrane, Welded by Torch (F)	Square Yard (Square Meter)
538.6	Barrier Membrane, Welded by Torch - Machine Method (F)	Square Yard (Square Meter)

156

03/13/07

544
SS

Page 1 of 1

SUPPLEMENTAL SPECIFICATION

AMENDMENT TO SECTION 544 -- REINFORCING STEEL

Amend to 2.1.2 to read:

2.1.2 Rail-steel bars shall conform to AASHTO M 322M/M 322.

**CONCORD
13742C**

July 15, 2009

SPECIAL PROVISION**AMENDMENT TO SECTION 547 – SHEAR CONNECTORS****Add to Construction Requirements****3.7 Spare Equipment and Personnel.**

The Contractor shall provide and maintain one spare setup of stud welding equipment, and one additional qualified operator onsite during the scheduled shear connector installation. The spare setup shall be completely operational, shall be independent from the primary installation equipment, and shall include a separate stud gun connected to a separate power source.

158

SUPPLEMENTAL SPECIFICATION

AMENDMENT TO SECTION 500 - STRUCTURES

AMENDMENT TO SECTION 550 -- STRUCTURAL STEEL

Add to 3.11.6:

3.11.6.1.4 All fasteners shall be lubricated immediately prior to or during installation using an approved paraffin-based stick wax, as listed on the NHDOT Qualified Products List, applied to the bolt threads and to the nut face in contact with the washer. When the bolt head is the turned element apply the stick wax to the washer face in contact with the bolt head and to the bolt threads.

August 3, 2009

**SPECIAL PROVISION
AMENDMENT TO 550 - STRUCTURAL STEEL**

Specific to LRFD Bearing Materials

Replace 2.6.1 with the following:

2.6.1 Type 1. Preformed fabric bearing pads shall meet the requirements of AASHTO LRFD Bridge Construction Specifications Section 18.10.2 "Materials for Bedding of Masonry Plates" and MIL-C-882 and be a product included on the Qualified Products List. Pads used to set bridge bearing masonry plates on concrete masonry (see 3.15.5) shall be a single sheet approximately 1/8 in (3 mm) thick.

Replace 2.10 with the following:

2.10 PTFE surfaces for bearings. PTFE for use in expansion bearing assemblies shall be 100 percent virgin (unfilled) polytetrafluorethylene polymer conforming to AASHTO LRFD Bridge Design Specifications Section 14.7.2 "PTFE Sliding Surfaces" and AASHTO LRFD Bridge Construction Specifications Section 18.8.2 "Materials for PTFE Surfaces for Bearings" and Section 18.8.3 "Fabrication Requirements for PTFE Surfaces for Bearings".

March 23, 2002

550

1 of 2

**CONCORD
13742C**

August 13, 2009

SPECIAL PROVISION

SECTION 550 -- STRUCTURAL STEEL

Item 550.191 -- Temporary Girder Support System

This special provision neither amends nor modifies other provisions of 550 except as referenced below.

Description

1.1 This work shall consist of the design, construction, and removal of temporary girder support system (including jacking, shoring and monitoring) as required during the rehabilitation work.

Materials

2.1 All materials to be used in the construction of the temporary girder support system shall be subject to inspection and approval prior to their incorporation in the work. Used materials will be acceptable, provided appropriate allowances are made for their condition.

Construction Requirements

3.1 Temporary girder support system shall be designed in accordance with the current AASHTO LRFD Bridge Design Specifications, as amended. Temporary girder support system shall meet the minimum strength requirements to carry all loads at stress levels not to exceed those allowed in the above specifications.

3.2 Detailed plans showing size, type and layout of jacks and temporary supports, member sizes and quality of materials to be used in the temporary girder support system and proposed ramping, if any pavement differential on a traveled way is expected, shall be submitted in accordance with 105.02. The plans shall be designed and stamped by a Licensed Professional Engineer registered in the State of New Hampshire.

161

3.3 Bolting or welding to the existing structural steel for construction purposes will not be permitted. Provision for the thermal movement of structural steel shall be made, as required. Anchoring into existing masonry shall be subject to the approval of the Engineer.

3.4 Jacking shall be applied directly to the girders and not to framing connections.

3.5 Jacks shall be operated to limit racking of the bridge. The maximum allowable height differential between any two adjacent girders shall be 6 mm (1/4"). The maximum jacking height for girders adjacent to bays with utilities shall be 25 mm (1").

3.6 During the jacking process, no girder shall be jacked without temporary supports, blocks, etc. placed so that the fall of the girder would be arrested if the jack failed.

3.7 When the temporary girder support system is no longer required, it shall be completely removed to the satisfaction of the Engineer and the construction area and structural steel restored to a condition equal to or better than that originally found.

Method of Measurement

4.1 Temporary girder support system used for supporting girders during the rehabilitation work shall be measured as a unit. This unit shall include all temporary girder support systems required in the work.

Basis of Payment

5.1 The accepted temporary girder support system will be paid for at the contract lump sum price.

Pay item and unit:

550.191	Temporary Girder Support System	Unit
---------	---------------------------------	------

1/29/99, 5/10/99, 1/13/00, 2/1/00, 4/11/00, 6/16/00,
 9/11/00, 11/22/00, 12/27/01, 3/4/02, 5/8/02, 5/17/02,
 1/27/03, 4/17/03, 5/22/03, 12/14/04, 1/13/06, 4/1/06, 9/28/06,
 10/5/06, 8/31/07, 1/25/08, (see List of Revisions in Part I)

**CONCORD
 13742C**

August 14, 2009

SPECIAL PROVISION

SECTION 556 -- PAINTING EXISTING STRUCTURAL STEEL

PART I of III -- PROJECT-SPECIFIC REQUIREMENTS

This special provision replaces section 556 and applies to the coating of existing structural steel as shown on the plans or otherwise specified to be painted. This special provision consists of three parts. Part I amends the general requirements of Part II with project-specific requirements. Part III contains section 708, Paints and Table 1-Containment Criteria.

Amend 1.1.2 to read:

1.1.2 DESCRIPTION OF BRIDGE(S)

1.1.2.1 The description of the existing bridge(s) to be painted is stated herein. All descriptions regarding the bridge(s) and surface area(s) are intended to be generally, but not guaranteed to be precisely, accurate.

1.1.2.2 Br. No. 163/106 I-93 NB, SB over NH Rte 9 (Loudon Road) in the City of Concord, NH.

1. This 1966 bridge is a previously painted, steel beam bridge with a reinforced concrete deck and steel pile bents (piers). The bridge has an existing coating containing lead-based paint (LBP). See Table 1.1.2.2.
2. Due to winter maintenance activities (e.g. snow removal and salting) chloride and ferrous salts should be expected to be present on the steel, especially at corrosion sites. Before surfaces can be painted, these salts shall be reduced to acceptable levels (see 3.2.5.11).

Description of Bridges - Summary Table 1.1.2.2							
Town	Bridge No.	Route	over	No. Spans	Length ft.	Surface Area	Existing Coating
Concord	163/106	I-93 NB, SB	NH Rte 9 (Loudon Rd)	1	82	10,400 sf	LBP

1.1.2.3 The structural steel described herein involves the total estimated surface area to be painted of 10,400 square feet, plus the bridge shoes.

1.1.2.4 The existing coatings contain hazardous concentrations of toxic metals and shall be handled as hazardous material.

1.1.2.5 Prospective bidders are advised that the existing paint condition, type, and thickness may vary throughout the bridge. Vinyl paint may be present. The Contractor should be aware that the presence of vinyl paint may affect the cleaning of surfaces (e.g. time required, abrasive recycling, etc.). The bidder is responsible for making a determination as to the work involved and the conditions to be encountered in performing the work, as per section 102.05. The Department is not bound by any

163

representation of the existing paint conditions on the bridge except to assert that it contains hazardous concentrations of lead, as described herein.

Amend 1.1.3 to read:

1.1.3 SCOPE OF WORK.

1.1.3.1 Surfaces to be Painted.

1. All structural steel surfaces, including beams, diaphragms, and shoes shall be cleaned and painted as described in 1.1.3.2. See Table 1.1.3. Area #1 is all structural steel surfaces and shoes as described; Area #2 are the fascia surfaces of fascia beams.

1.1.3.2 Required Work.

1. All structural steel surfaces to be painted require the Total Repainting option, unless stated otherwise. See Table 1.1.3.
2. Options
 - a) Total Repainting requires the following:
 - the complete removal of all existing coatings, rust, and mill scale by cleaning in accordance with SSPC-SP10 (3.2.5.9);
 - using Class 1A containment criteria required (3.3.1 and Table 1);
 - cleaning to an SSPC-SC2 condition (3.2.5.11); and
 - the full application of a multi-coat paint system as specified (see Table 1.1.3).
 - b) Maintenance Overcoat-Level 1 requires the following:
 - Protect sensitive areas during all phases of the project from damage resulting from abrasive blasting, errant coating application, steel erection, and all other Contractor activities.
 - the cleaning of all surfaces to be painted by low pressure water cleaning in accordance with SSPC-SP12 LP WC (3.2.5.9) using an approved biodegradable liquid soluble-salt remover;
 - solvent cleaning as necessary in accordance with SSPC-SP1 (3.2.5.9);
 - preparing spot areas of corrosion (rust, pinpoint rust, etc.) or deteriorated coatings (alligatoring, blisters, checks, cracks, mudcracking, delamination, peeling, etc.) by power tool cleaning to bare metal in accordance with SSPC-SP15 (3.2.5.9);
 - using containment criteria required (3.3.1 and Table 1);
 - the cleaning of all surfaces to be painted to an SSPC-SC2 condition (3.2.5.11); and
 - the full application of a four-coat paint system (1.1.3.3).
 - c) Maintenance Overcoat-Level 2 requires the following:
 - the cleaning of all surfaces to be painted by low pressure water cleaning in accordance with SSPC-SP12 LP WC (3.2.5.9) using an approved biodegradable liquid soluble-salt remover;
 - solvent cleaning as necessary in accordance with SSPC-SP1 (3.2.5.9);
 - preparing spot areas of loose mill scale, loose rust, loose paint, and other loose detrimental foreign matter in accordance with SSPC-SP3 (3.2.5.9);
 - using containment criteria required (3.3.1 and Table 1);
 - the cleaning of all surfaces to be painted to an SSPC-SC2 condition (3.2.5.11); and

- the spot application of a primer and full application of a two-coat paint system (1.1.3.3).
- d) Spot Repair and Overcoat requires the following:
- the cleaning of all surfaces to be painted to an SSPC-SC2 condition (3.2.5.11);
 - solvent cleaning as necessary in accordance with SSPC-SP1 (3.2.5.9);
 - preparing spot areas of corrosion (rust, pinpoint rust, etc.) or deteriorated coatings (alligatoring, blisters, checks, cracks, mudcracking, delamination, peeling, etc.) to bare metal conforming to SSPC-SP15, Commercial Grade Power Tool Cleaning (3.2.5.9);
 - using containment criteria required (3.3.1 and Table 1);
 - prime spot areas of bare metal, and the full overcoat application to all areas of a penetrating sealer and finish coat (1.1.3.3).
- e) Faying Surfaces of Existing Steel at Retrofit Areas for New Item 550.xxx Members
- the complete removal of all existing coatings, rust, and mill scale by cleaning in accordance with SSPC-SP10 (3.2.5.9);
 - cleaning shall extend approximately 6 inches (min.) beyond the edges of the new steel member; feather the edges of adjacent remaining old paint (3.2.5.12);
 - use abrasive blasting and appropriate containment criteria required (3.3.1 and Table 1);
 - apply a full primer coat to cleaned surfaces;
 - install new (Item 550.xxx) shop-primed structural steel plates, shapes, and galvanized bolts per the plans;
 - clean new steel (Item 550.xxx) surfaces as necessary of oils and contaminants per SP1 and apply a full coat each of the sealer, intermediate, and finish coats to steel surfaces and to adjacent prepared areas, as described above.

1.1.3.3 Required Paint System

1.1.3.3.1 Use the following paint system(s) for the work required in 1.1.3.2 (see Table 1.1.3):

- a) Total Repainting requires that the areas to be painted receive one full application each of the primer, intermediate, and finish coats of paint system C using Finish #1 (Area #1) and paint system C using Finish #1 & #3 (Area #2).
- b) Maintenance Overcoat-Level 1 requires that all surfaces to be painted receive one full application each of the primer, sealer, intermediate, and finish coats of paint system [blank].
- c) Maintenance Overcoat-Level 2 requires that areas prepared to an SP3 condition receive a spot primer application of the intermediate coat (acting as a primer at 2-4 mils DFT) and all surfaces to be painted receive one full application each of the intermediate and finish coats of paint system [blank].
- d) Spot Repair and Overcoat requires that Area #2 prepared to bare metal receive a spot application of the primer at 4 mils DFT (min.) and all surfaces to be painted receive one full application each of the intermediate and finish coats of paint system [blank].
- e) Faying Surfaces of Existing Steel at Retrofit Areas for new Item 550.xxx members requires that all surfaces to be painted receive one full application of the primer coat of paint system [blank] prior to installation of the member. The remaining sealer, intermediate, and finish coats of the system are to be applied after installation of the part, per Item 550.xxx.

Note the manufacturer's requirements and restrictions for recoat times for all coats.

1.1.3.3.2 For the finish color required, see Table 1.1.3.

Scope of Work - Summary Table 1.1.3					
Item No.	Area	Surfaces to be painted 556.1.1.3.1	Required Work 556.1.1.3.2	Required Paint System 556.1.1.3.3	Final Color 556.2.2.1.2 (9)
556.101	1	All structural steel beams, diaphragms, and shoes	<u>Total Repainting</u> SP10 & SC2	3 coats - system C (with Finish #1)	Dark Green Fed # 24109
556.101	2	All <u>fascia</u> surfaces of fascia beams	<u>Total Repainting</u> SP10 & SC2	4 coats - system C (with Finish #1 & #3)	Dark Green Fed # 24109

Add the following sentence to 1.7.3.1:

The requirement to analyze the bridge for the effects of construction loads is waived provided support vehicles are of legal loads, the containment enclosure is operated with a maximum design wind speed of 40 mph (64.4 kmph), and abrasive debris supported by the bridge is recovered continuously and not permitted to build up.

Add 1.7.6:

1.7.6 Project Summary Report.

1.7.6.1 The Contractor shall submit a condensed project summary report to the Bureau of Bridge Design within two weeks of the completion of the project. The report shall briefly (but completely) summarize the essential components of the project. The report shall be presented in an 8 1/2 x 11 inch three-ring loose leaf binder containing the following project summary information:

1. Color photographs (3 1/2 x 5 inch minimum size and CD of digital images):
 - general view of the bridge (before work begins and after project is completed);
 - containment enclosures;
 - traffic control measures;
 - equipment operating on the site;
 - placement of air monitors;
 - waste storage;
 - surface preparation tools and methods in operation;
 - (close up photos) of typical existing coating condition at the start and the substrate after surface preparation, and the condition after painting;
2. Documentation:
 - abrasives used (brand and size);
 - coating product data sheets;
 - coating thickness (DFT summaries)
 - site sketch marked with locations of staging area, monitoring and sampling locations;
 - name of hazardous waste transporter and treatment, storage & disposal (TSD) facility
 - manifests of waste removed from the site;

166

- total quantity of hazardous waste generated and disposed of;
3. Testing results:
 - chloride testing;
 - worker blood lead levels;
 - worker air monitoring;
 - environmental air monitoring;
 - soil testing (before and after);
 4. Project feedback:
 - OSHA violations (if applicable).
 - brief narrative of project work schedule, problems encountered, and recommendations for future work.

Add the following to 2.3.1:

2.3.1.5 Provide two (2) hand held portable lights, capable of minimum of 200 foot candles illumination, and a light meter at the work site for use by the Department.

2.3.1.6 Provide at least two (2) communication devices for use in providing two-way communication at all times between the outside and inside of the containment or scaffold system.

2.3.1.7 Provide wind meters or weather monitoring station to monitor wind speeds at the containment.

Add the following sentence to 2.3.3:

Rapid Deployment methods are required for all work.

Add 3.1.2.2:

The Contractor shall complete and submit a SSPC Field Project Job Notification Form to SSPC Painting Contractor Certification Program (PCCP) (tel. 1-877-281-7772), within 15 days of contract award and provide a copy to the Department (<http://www.sspc.org/forms/jobnotification/index.nclk>).

Add to 3.2.4:

The mandatory requirement for a site visit by the technical representative of the paint manufacturer to inspect the Work is waived provided the Contractor has previously and successfully applied the same coating(s) as that which is to be used in this contract.

Amend 3.2.5.11 (3) to read:

3. Test for chlorides after surface preparation at the following frequency, unless approved otherwise: one test for each 1,000 sf, for a minimum number of 10 locations. Test locations are to be approved by the Department.

Add the following to 3.3:

3.3.1.5 All monitoring shall be conducted under the observation of the Department for activities such as high volume monitoring (3.3.12.1(3)), soil sampling (3.3.10.1(2)), monitoring regulated areas

(3.4.12.2), and final clearance (3.3.13.3(1)). Monitoring and sampling documentation shall be signed by the Department Representative.

Amend the first sentence of 3.3.12.2 (1) to read:

Establish two locations if abrasive blasting methods are used.

Add to 3.5.1.1:

The EPA ID number for this project is NHD 510 200 967.

Add to 3.5.1:

3.5.1.5. The Contractor shall be certified by the NH DES Hazardous Waste Coordinator Training and Certification Program for Full Quantity Generators per RSA 147-A:5, III. Contact NH DES at 271-2942 to schedule the one-day certification training class.

3.5.1.6. The Contractor shall notify the NH DES WMD RIMS (tel. 603-271-2921) one week prior to generating hazardous waste to activate the project for their records. The Contractor shall also provide RIMS with the name of the Contractor's NHDES-certified Hazardous Waste Coordinator (HWC) who will be at the jobsite during the project. At the completion of the project, submit the NH DES Hazardous Waste Declassification Form (located elsewhere in the Proposal) to NH DES WMD RIMS to deactivate the project for their records.

Add to 3.5.6:

3.5.6.2 Hazardous Waste Transport

3.5.6.2.1 Hazardous waste generated from painting activities on a bridge should be stored at or immediately adjacent to the bridge location in a secure temporary waste storage area. This bridge has suitable storage areas available adjacent to the bridge on State property on Stickney Avenue.

3.5.6.2.2 By written requirements from NHDES WMD (letter dated January 12, 2007) and summarized herein, the Contractor may transport waste to a nearby secure centrally-located waste storage area along public roadways, without manifesting, under the following conditions:

1. The storage area is either owned by the Department, or the property owner has given written permission to use the property for this purpose (106.06);
2. The storage area is under the direct control of the Department or the NHDOT contractor;
3. Public access to the storage area is controlled (i.e. restricted or prohibited);
4. The transporter of waste is the same qualified Contractor performing bridge painting activities;
5. Proper and safe handling procedures are observed, including use of approved containers, etc.;
6. The waste is transported with a police escort following the transport vehicle along public roadways, in order to ensure that all waste is accounted for, and to provide a buffer zone of

168

control between the transport vehicle and the traveling public to prevent contact in the event of an accidental spill;

7. The travel distance from the bridge(s) to the storage area along public roadways is not greater than five miles;
8. The NHDES WMD RIMS must approve the storage area location if it is not at or immediately adjacent to the bridge, or if it is different from the storage area designated in the pre-project application for the EPA ID number (see paragraph 9 below), in which case the Contractor is responsible for obtaining approval from DES;
9. The designated waste storage area is noted on the map accompanying the NHDES Notification of Hazardous Waste Activity form located elsewhere in the Proposal.

Revision Date	LIST OF REVISIONS (generally stated - see specification for actual wording)
1/25/08	<ul style="list-style-type: none"> • 1.7.2.1 (4) - Add requirement to identify the person performing QC functions; • 1.7.3.1 (4,5,6) - further develop requirements regarding scaffolding; • 1.7.4.1.1 - account for subcontractors in worker compliance plan submittal; • 2.2.1.2 (3) - Add requirements for finished appearance; • 2.3.1 (5,6,7) - Add requirement to provide lights, communication, and wind meter; • 3.1.2.2 - Reword requirement to notify SSPC PCCP of work; • 3.2.7.9. (1,5) - Add requirement for drip repairs and a uniform final appearance; • 3.2.5.9.1b - reword screening requirements for wash water; • 3.2.8.1 (5) - add requirements for cleaning attachment points; • 3.3.4.3 - add requirements for installing and inspection of scaffolding; • 3.3.6 (3,4) - add requirements for protecting utilities; • 3.3.8.9 - add high wind monitoring; • 3.3.9.4 - reword requirements for containment joints • 3.3.11.1.3 - revise soil sampling procedures to SSPC-TU7; • 3.3.16.1 - add requirements regarding overspray protection; • 3.5.6.1 - reword requirements regarding hazardous waste manifests. • 3.5.6.2 - add special NHDES requirements for hazardous waste transport.
8/31/07	<ul style="list-style-type: none"> • 708 update QPL • 2.2.1.2 and 708 - add Paint Systems F & G. • 2.2.1.2 (3) Change the maximum VOC limit to 2.8 lb/gal (340 g/L). • 3.2.5.5 - Require removal of all loose pack rust. • 3.2.7.5 - Require caulking to seal crevices as default treatment. • 3.3.10.1 (3) - Add reference to SSPC-TU7.
10/5/06	<ul style="list-style-type: none"> • 708 update QPL
9/28/06	<ul style="list-style-type: none"> • Basis of Payment - change to "percent of the item that has been completed".
4/1/06	<ul style="list-style-type: none"> • 3.3.3 Add that drilling is not permitted into substructure bridge components
1/13/06	<ul style="list-style-type: none"> • Remove proprietary reference to Chlor*Rid ® wash water additive • Remove proprietary reference to 3M Scotch-Brite™ Clean and Strip disc

169

PART II of III -- GENERAL REQUIREMENTS

Part II states general requirements for painting existing structural steel as amended by project specific requirements of Part I.

OUTLINE OF SECTION 556:

PART I PROJECT-SPECIFIC REQUIREMENTS

PART II GENERAL REQUIREMENTS

- 1 DESCRIPTION
 - 1.1 General
 - 1.2 Painting Existing Structural Steel (Item 556.101)
 - 1.3 Containment & Environmental Protection (Item 556.201)
 - 1.4 Worker Protection (Item 556.301)
 - 1.5 Waste Management (Item 556.401)
 - 1.6 Reference Standards
 - 1.7 Submittals

- 2 MATERIALS
 - 2.1 General
 - 2.2 Painting Existing Structural Steel (Item 556.101)
 - 2.3 Containment & Environmental Protection (Item 556.201)
 - 2.4 Worker Protection (Item 556.301)
 - 2.5 Waste Management (Item 556.401)

- 3 CONSTRUCTION REQUIREMENTS
 - 3.1 General
 - 3.2 Painting Existing Structural Steel (Item 556.101)
 - 3.3 Containment & Environmental Protection (Item 556.201)
 - 3.4 Worker Protection (Item 556.301)
 - 3.5 Waste Management (Item 556.401)

- 4 METHOD OF MEASUREMENT

- 5 BASIS OF PAYMENT

PART III 708 PAINTS

TABLE B- PAINT SYSTEM B
 TABLE C- PAINT SYSTEM C
 TABLE D- PAINT SYSTEM D
 TABLE E- PAINT SYSTEM E
 TABLE F- PAINT SYSTEM F
 TABLE G- PAINT SYSTEM G
 TABLE H- PAINT SYSTEM H
 TABLE 1- CONTAINMENT CRITERIA

170

DESCRIPTION

1.1 GENERAL.

1.1.1. GENERAL DESCRIPTION.

1.1.1.1 This work shall consist of the cleaning, surface preparation, and painting of existing structural steel, including pollution controls, containment and environmental protection, worker protection, and waste management as specified herein and in the contract documents.

1.1.1.2 The location, description of the structure(s) and specific requirements will be described herein and in the contract documents.

1.1.2. DESCRIPTION OF BRIDGE.

(See Section 556 Part I)

1.1.3 SCOPE OF WORK.

(See Section 556 Part I)

1.1.4 REGULATORY COMPLIANCE.

1.1.4.1 Comply with the requirements of this Item and all applicable Federal, New Hampshire state laws, codes, and regulations, including, but not limited to the regulations of the United States Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), the U.S. Coast Guard, and the New Hampshire Department of Environmental Services (NHDES) in accordance with Section 107.

1.1.4.2 Identification of the items below which are of specific interest to NHDOT in no way relieves the Contractor of the responsibility to comply with all OSHA and EPA requirements, nor should it be construed that the NHDOT, the EPA, NHDES, or other State and City regulators are only interested in these items. If a Federal, State, or City regulation is more restrictive than the requirements of this Item, follow the more restrictive requirements.

1.1.5 **CONTRACTOR RESPONSIBILITY.** The Contractor is responsible for performing the requirements stated herein, whether the specification wording states this explicitly (e.g. "The Contractor shall conduct all operations...") or implicitly (e.g. "Conduct all operations..."), unless the wording specifically names a different party (e.g. 3.2.10.1 "The Department will inspect...").

1.2 PAINTING EXISTING STRUCTURAL STEEL (ITEM 556.101).

1.2.1 Provide all materials, apparatus, and labor necessary to perform the scope of work identified in Section 556 Part I, whether or not the material or apparatus is specifically identified in this Item.

1.2.2 Conduct all surface preparation and painting operations in a workmanlike manner to the satisfaction of the Department. Use only experienced workers with a minimum of two years previous experience in industrial painting.

1.2.3 Coordinate all painting activities to assure that the products of only one paint manufacturer are utilized on the entire structure.

1.2.4 The existing coating being removed contain lead and other toxic metal(s). Implement special controls for the protection of Contractor workers, the public, and the environment, and for the handling and disposal of the waste. Comply with the Technical Specifications addressing these requirements found in Items 556.201, 556.301, and 556.401. The Contractor is required to perform toxic metal testing on the existing paint, but all work practices are to handle the existing paint and wastes as containing hazardous concentrations of lead.

1.3 CONTAINMENT & ENVIRONMENTAL PROTECTION (ITEM 556.201).

1.3.1 Section 556 Part I identifies the scope of work for the project. This Item and the attached Table 1 provide the material and execution requirements for the installation and use of containment systems for the specified method(s) of paint removal. This Item also provides the requirements for the implementation of an Environmental Protection Plan for the protection of the public and the environment from exposure to harmful levels of dust, paint debris, and lead and other toxic metals that may be present in the paint being removed or repaired.

1.3.2 Furnish all manpower, equipment and services necessary and incidental to protect the public, vehicles, surrounding property, workers, and the environment. This includes all means and methods necessary for the containment, collection and removal of old paint chips, corrosion residues, spent abrasives and newly applied paint. Comply with all worker protection requirements stipulated in Item 556.301 and waste handling requirements stipulated in Item 556.401.

1.3.3 Conduct daily assessments of visible emissions and releases, and conduct air, soils, and water testing/analysis as stipulated in this Item. Undertake all necessary corrective action to control emissions and clean up the work site during and after the project, including the removal of pre-existing litter or debris.

1.4 WORKER PROTECTION (ITEM 556.301).

1.4.1 Section 556 Part I identifies the scope of work for the project. This Item provides the material and execution requirements for implementing a Lead (Toxic Metal) Health and Safety Program for the protection of Contractor workers in strict compliance with all of the applicable OSHA regulations. The program is for the protection of workers (and two Department Representatives) from overexposure to lead and other toxic metals that may be present in the paint being removed or repaired.

1.4.2 The Department may provide information on the presence of lead, cadmium, chromium, hexavalent chromium (CRVI) and arsenic in the paint. When test results are provided, they are for bidding purposes only. Conduct worker exposure monitoring for toxic metals at project start up, and adjust all protection, training, medical surveillance, and recordkeeping provisions according to the airborne exposures detected.

1.5 WASTE MANAGEMENT (ITEM 556.401).

1.5.1 Section 556, Part I, identifies the scope of work for the project. This Item provides the material and execution requirements for ensuring that all project waste is properly collected, handled, stored, classified, transported, and disposed of in accordance with applicable regulations. The Department and the Contractor are considered to be co-generators of the waste.

172

1.5.2 The Waste Handling Plan required under this Item is for the protection of the workers, the public, and the environment from exposure to harmful levels of dust, lead, and other toxic metals that may be present in the paint being removed or repaired.

1.6 REFERENCE STANDARDS

1.6.1 The latest edition of the following standards and regulations in effect at the time of the Bid form a part of this Specification. Maintain at the job site, a copy of the reference standards applicable to the work of the Contractor.

1.6.2 American Society for Testing and Materials (ASTM)

1. ASTM D1400, Standard Test Method for Non-Destructive Measurement of Dry Film Thickness of Non-Conductive Coatings Applied to a Non-ferrous Metal Base
2. ASTM D3359, Standard Test Methods for Measuring Adhesion by Tape Test
3. ASTM D4138, Standard Test Method for Measurement of Dry Paint Thickness of Protective Coating Systems by Destructive Means
4. ASTM D4285, Standard Test Method for Indicating Oil or Water in Compressed Air
5. ASTM D4414, Standard Practice for Measurement of Wet Film Thickness by Notch Gages
6. ASTM D4417, Standard Test Methods for field Measurement of Surface Profile of Blast Cleaned Steel
7. ASTM D4541, Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers

1.6.3 Code of Federal Regulations (CFR)

1. 29 CFR 1910.134, Respiratory Protection
2. 29 CFR 1926, Occupational Safety and Health Regulations for the Construction Industry
3. 29 CFR 1926.51, Sanitation
4. 29 CFR 1926.55, Gases, Vapors, Fumes, Dusts, and Mists
5. 29 CFR 1926.62, Lead
6. 29 CFR 1926.103, Respiratory Protection
7. 29 CFR 1926.1118, Inorganic Arsenic
8. 29 CFR 1926.1126, Hexavalent Chromium (CRVI)
9. 29 CFR 1926.1127, Cadmium
10. 40 CFR 50, National Primary and Secondary Ambient Air Quality Standards
11. 40 CFR 58, Ambient Air Quality Surveillance
12. 40 CFR 60, App. A, Method 9, Visual Determination of the Opacity of Emissions from Stationary Sources
13. 40 CFR 60, App. A, Method 22, Visual Determination of Fugitive Emissions from Material Sources and Smoke Emissions from Fires
14. 40 CFR 261, Appendix II, Toxicity Characteristic Leaching Procedure
15. 40 CFR 262, Standards Applicable to Generators of Hazardous Waste
16. 40 CFR 263, Standards Applicable to Transporters of Hazardous Waste
17. 40 CFR 264, Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
18. 40 CFR 265, Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
19. 40 CFR 265, Subpart C, Preparedness and Prevention
20. 40 CFR 265, Subpart D, Contingency Plan and Emergency Procedures

21. 40 CFR 265.16, Personnel Training
22. 40 CFR 268, Land Disposal Restrictions
23. 40 CFR 302, Designation, Reportable Quantities and Notification
24. 40 CFR 355, Emergency Planning and Notification
25. 49 CFR 171-179, Hazardous Materials Regulations

1.6.4 Environmental Protection Agency (EPA) Methods

1. Method 3050, Acid Digestion of Sediment, Sludge, and Soils
2. Method 1311, Toxicity Characteristic Leaching Procedure (TCLP)
3. EP/600/R-94/038b, Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II, Ambient Air Specific Methods, Section 2.8 (Lead) and 2.11 (PM-10).
4. SW 846, Test Methods for Evaluating Solid Waste - Physical/Chemical Methods

1.6.5 National Institute for Occupational Safety and Health (NIOSH) Methods

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

1.6.6 Society for Protective Coatings (SSPC)

1. SSPC-SP 1, Solvent Cleaning
2. SSPC-SP 2, Hand Tool Cleaning
3. SSPC-SP 3, Power Tool Cleaning
4. SSPC-SP 7 / NACE No. 4, Brush Off Blast Cleaning
5. SSPC-SP 10 / NACE No. 2, Near-White Metal Blast Cleaning
6. SSPC-SP 11, Power Tool Cleaning to Bare Metal
7. SSPC-SP 12 / NACE No. 5, Surface Preparation and Cleaning of Steel and Other Hard Metals by High- and Ultrahigh- Pressure Water Jetting Prior to Recoating
8. SSPC-SP 14 / NACE No. 8, Industrial Blast Cleaning
9. SSPC-SP 15 / NACE No. 5, Commercial Grade Power Tool Cleaning
10. SSPC-AB1, Mineral and Slag Abrasives
11. SSPC-AB2, Specification for Cleanliness of Recycled Ferrous Metallic Abrasives.
12. SSPC-AB 3, Newly Manufactured or Re-Manufactured Steel Abrasives
13. SSPC-PA 1, Shop, Field, and Maintenance Painting
14. SSPC-PA 2, Measurement of Dry Film Thickness with Magnetic Gages
15. SSPC-SP COM, Surface Preparation and Abrasives Commentary, SSPC Painting Manual, Vol. 2, "Systems and Specifications"
16. SSPC-TU4, Field Methods for Retrieval and Analysis of Soluble Salts on Substrates.
17. SSPC-TU7, Conducting Ambient Air, Soils and Water Sampling During Surface Preparation and Paint Disturbance Activities.
18. SSPC-VIS 1, Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blasting
19. SSPC-VIS 3, Visual Standard for Power- and Hand- Tool Cleaned Steel
20. SSPC-VIS 4 / NACE VIS 7, Guide and Reference Photographs for Steel Surfaces Prepared by Waterjetting
21. SSPC Guide 6, Guide for Containing Debris Generated During Paint Removal Operations
22. SSPC Guide 7, Guide for the Disposal of Lead-Contaminated Surface Preparation Debris
23. SSPC Guide 12, Guide for Illumination of Industrial Painting Projects
24. SSPC Guide 16, Guide to Specifying and Selecting Dust Collectors

174

25. SSPC 93-02, Industrial Lead Paint Removal Handbook, 2nd Edition, Volume I
26. SSPC 95-06, Project Design, Industrial Lead Paint Removal Handbook, Volume II
27. SSPC QP1, "Standard Procedure for Evaluating Painting Contractors (Field Application to Complex Industrial Structures)", August 1, 1998
28. SSPC QP2, "Standard Procedure for Evaluating the Qualifications of Painting Contractors to Remove Hazardous Paint", August 1, 1995.

1.6.7 American Industrial Hygiene Association

1. Environmental Lead Proficiency Analytical Testing Program (ELPAT)

1.6.8 American Association of State and Highway Transportation Officials (AASHTO)

1. Manual for Maintenance Inspection of Bridges, 1983, as amended.
2. AASHTO Standard Specification for Highway Bridges, Division II Construction, Section 13, Painting.

1.6.9 Rules Of The N. H. Dept. Of Environmental Services (NHDES)

1. Part Env-A 303 Primary and Secondary Ambient Air Quality Standards for Particulate Matter
2. Part Env-A 308 Primary and Secondary Ambient Air Quality Standards for Lead
3. Part Env-A 1002 Fugitive Dust
4. Part Env-Wm 100 – 513 Solid and Hazardous Waste Rules

1.6.10 Compressed Gas Association

1. Commodity Specification G-7.1-1989 - Grade D Breathing Air

1.6.11 Equipment and Coating Manufacturers' Published Instructions

1.6.12 U.S. Department Of Labor (OSHA)

U.S. Department of Labor
Occupational Safety and Health Administration (OSHA)
279 Pleasant Street
Concord, NH 03301

1.7 SUBMITTALS.

1.7.1 GENERAL.

1.7.1.1 Submit the plans and programs required herein to the Department for approval or documentation in accordance with 105.02 a minimum of 15 working days prior to start on the appropriate portion of the work, unless directed otherwise. The Department will return submittals within 10 working days after receiving them.

1.7.1.2 Department Review. Do not construe Department acceptance of Contractor submittals to imply approval of any particular method or sequence for conducting the work, or for addressing health and safety. Acceptance of the programs does not relieve the Contractor from the responsibility to conduct the work in strict compliance with the requirements of this Item or to adequately protect the health and safety of all workers involved in the project including any members of the public who may be

175

affected by the project. The Contractor remains solely responsible for the adequacy and completeness of the programs and work practices, and adherence to them.

1.7.2 PAINTING EXISTING STRUCTURAL STEEL (ITEM 556.101)

1.7.2.1 Surface Preparation/Painting Plan. Provide the following surface preparation / painting plan to the Department for approval in accordance with 105.02.

1. Provide written procedures for the preparation of surfaces, the remediation of chlorides, and coating application and repair. Include a description of the equipment that will be used for surface preparation and painting.
2. Identify the methods of protection or work isolation procedures that will be followed to protect surrounding structures, equipment, and property from exposure to surface preparation and paint debris.
3. Identify the type and brand name of the abrasive proposed for use, and provide Material Safety Data (MSD) sheets.
4. Include the name, experience, and qualifications (as required by SSPC QP1) of the quality control person who will be performing QC observations and documentation. Include copies of the documentation that will be completed on daily basis by the QC to ensure compliance with the specifications. Provide a list of coating inspection equipment that will be used by the QC to perform observations.
5. If wet abrasive blast cleaning is performed, include a letter from the coating manufacturer which states that applying the primer over light rust-bloom will not reduce coating performance.

1.7.2.2 Coating/Caulking Material Documentation

1. Identify the coating materials to be applied. Include the manufacturer's name, product names, and product numbers. Provide material product data sheets, volatile organic compound (VOC) levels, MSD sheets, and written application instructions including mixing requirements, specified thinners, and thinner amounts.
2. The finish coat color shall be as shown in Section 556 Part I as per Federal Standard 595. Provide a 3 x 6 inch (75 x 150 mm) panel coated with the finish color to the Department for approval prior to application.
3. Submit documentation that the complete system meets the specified standard of 708 and a Certificate of Compliance for the paint material, in accordance with the requirements of 106.04.
4. When the use of caulking is specified in 3.2.7.5, provide the name, generic type, and MSDS for the proposed material. The caulking must be approved by the coating manufacturer for use. Include a letter from the coating manufacturer acknowledging acceptance of the caulking for use with the coating system.

176

5. In the event of a conflict between the manufacturer's technical data and the requirements of this Item, comply with this Item unless the requirements of the manufacturer are more restrictive. In these cases, advise the Department of the discrepancies in writing, and comply with the Department's written resolution.

1.7.2.3 Coating Samples for Testing.

1. Submit one sample of each initial coating material batch to the NHDOT Bureau of Materials and Research for testing and acceptance (Stickney Ave., Concord, NH 03301 Tel. 603-271-1660).
2. Provide original, unopened, one-pint (0.47 L) samples directly from the manufacturer, or 5-gallon (18.9 L) containers directly from the jobsite. Mark all samples with the job-specific project name and number.
3. Submit the samples a minimum of ten (10) days prior to the commencement of field painting operations.
4. Provide samples of subsequent batches as directed by the Department throughout the course of the project.
5. When samples are requested, paint from the respective batches cannot be used until authorized by the Department.
6. Provide to the NHDOT Materials Lab (at PO Box 483, 5 Hazen Drive, Concord, NH 03302-0483, tel. 603-271-3151) with a certificate of conformance from the coating manufacturer including a batch analysis of each production lot for each coating which includes the following properties:

a. Total solids (% by weight)	per ASTM D 2369
b. Pigment (% by weight)	per ASTM D 2371
c. Weight per volume (pounds per gallon)	per ASTM D 1475
d. Sag resistance (Leneta) in micrometers wet film thickness	per ASTM D 4400
e. Drying time to touch, to handle, and to recoat (min)	per ASTM D 1640.
f. Volatile Organic Compounds	

1.7.3 CONTAINMENT & ENVIRONMENTAL PROTECTION (ITEM 556.201)

1.7.3.1 Containment - Provide structural working drawings (i.e. scaffolding plans and bridge analysis) to the Department for documentation and non-structural working drawings for approval in accordance with 105.02. Do not begin the erection of the containment enclosure, or conduct any paint disturbance activities until Department approval to proceed has been obtained. Throughout the entire project, only conduct work within approved containment enclosures.

1. Detailed drawings to be stamped by a Professional Engineer licensed in the State of New Hampshire.
2. Do not allow the containment system to induce a load on the bridge which will exceed the legal highway or bridge load limits, create an overstress condition, or otherwise effect the structural integrity of the bridge. Analyze the bridge for the effects of wind forces as well as

the containment system itself and all other imposed loads (e.g. equipment, waste, traffic, etc.). Do not allow the stresses calculated in the bridge structure, together with all other imposed loads, to exceed the Operating Capacity stipulated in AASHTO Manual for Condition Evaluation of Bridges, 2nd Edition, 2000, as amended.

3. Do not allow the containment enclosure(s), or scaffolding shall not be permitted to swing into, encroach upon, or remain in place over or on roadway lanes open to highway traffic and required bridge clearances, unless otherwise permitted by the Department.
4. Provide the data, calculations, and assumptions used for the design of scaffold platform(s). Demonstrate that the platform and its components are designed and constructed to support at least 4 times its maximum intended load without failure, with wire cables capable of supporting at least 6 times their maximum intended load without failure and the imposed loads on the existing structure, stamped by a Professional Engineer licensed in the State of New Hampshire.
5. Provide the data, calculations, and assumptions used for the design of containment and ventilation system(s) including proposed containment dimensions, locations and size of air inlets and length, diameter and number of bends in ductwork, calculation of static pressure loss in the ventilation system (based on the fan curve) and the design airflow in the containment air inlets and ductwork stamped by a Professional Engineer licensed in the State of New Hampshire
6. Provide the sequence of containment including the plan for staging, installing, moving, and removing the containment, and the methods of attachment that will be used. Make attachment points to substantial framing members only. Include the methods of access that will be provided to work areas inside containment, locations of safety lines, and locations of containment entryways.
7. Provisions for dropping the containment in inclement weather, provisions for movement out of navigation lanes as required by the U.S. Coast Guard, as applicable, and the controls that will be exercised to prevent excessive sagging during cable installation (e.g. temporary cradles) to ensure the protection of traffic.
8. Plans for maintaining the navigational lighting during the work.
9. Plans for lighting the inside of the containment for surface preparation, painting, and inspection.
10. Plans for the collection and removal of debris from the surface of water when working over streams, rivers, lakes, and other bodies of water.
11. Technical data sheets, specification sheets, any other information needed to thoroughly describe the containment plan, materials, and containment and ventilation equipment proposed for use. Include fan curve for dust collector.

1.7.3.2 Environmental Protection. Submit the following Environmental Protection Plan and laboratory information for Department approval in accordance with 105.02 a minimum of 15 working days prior to exposure to toxic metals.

178

1. **Environmental Protection Plan.** Submit an Environmental Protection Plan which establishes programs for the monitoring activities that will be undertaken on the project.
 - a) **Assessments of Visible Emissions and Releases.** A written program for the observation of visible emissions during project activities, and inspections for releases or spills of dust and debris that become deposited on surrounding equipment, property, soil, water, and sediment. Include the frequency and methods of observation and inspection that will be made, areas or work activities that will be observed, and the frequency and nature of clean up that will be undertaken. Include the name(s) and qualifications of the personnel conducting the observations and inspections.
 - b) **Regulated Area Monitoring and Maintenance.** A written program for establishing and maintaining regulated areas around activities which could generate airborne emissions of lead or other toxic metals. Details for the development of this plan are presented in Item 556.301 for worker protection. Include a copy of the plan in this Environmental Protection Plan, or provide a cross-reference to the Worker Protection Compliance Program required under Item 556.301.
 - c) **High Volume Ambient Air Monitoring.** When required in 556, Part I, conduct high volume ambient air monitoring to assure compliance with this Item, National Ambient Air Quality Standards (NAAQS), and any applicable City or County regulations. Provide procedures for the monitoring which confirm that the monitoring equipment is properly calibrated, sited, and operated; filters are properly handled and transported; the laboratory analysis is performed correctly; and that all monitoring, calculations, documentation, and forms will be provided directly to the Department by the monitoring firm, with copies to the Contractor. (See 3.3.12.1). Clearly identify proposed monitor locations. Include statements that corrective action will be implemented immediately in the event of unacceptable results.
 - d) **Ground (Soil) Evaluations.** A written program for inspection of the ground and soil prior to commencement of the project and upon completion to assure that the ground is not impacted by project activities. Conduct sampling and analysis of the soil to determine whether it has been impacted by project activities. Include the requirements of 3.3.10 of this Item when establishing the methods that will be used for the pre-job and post-job sampling and laboratory analysis of the samples. State that all monitoring, calculations, documentation, and forms will be provided directly to the Engineer by the monitoring firm, with copies to the Contractor. Clearly identify proposed sampling locations. Identify the corrective action that will be taken in the event of unacceptable results.
 - e) **Water/Sediment Evaluations.** A written program for visual inspection of the water and sediment along the river bank prior to commencement of the project and upon completion to assure that the water and sediment along the river bank are not impacted by project activities.
 - f) **Remediation of Ground (Soil), Water, and Sediment.** Include provisions in the Plan that in the event post-project inspection, sampling or analysis show unacceptable results, the Contractor will undertake the necessary clean up or remediation of the ground (soil), water, and sediment along the river bank as appropriate as directed by the Department. Clean up to pre-project levels is required as stipulated in Item 556.201.

- g) **Final Cleaning/Clearance Evaluations.** A written program identifying the procedures and methods that will be used to conduct final project clean up, and final visual cleanliness inspections and evaluations. The purpose of the clearance tests is to assure that the project area and surrounding equipment, structures, soil, water, and sediment along the river bank have been properly cleaned in compliance with this Item.
2. **Laboratory Qualifications.** Provide the name of the laboratory and/or firm that will be used for the regulated area exposure monitoring, and when specified, the high volume ambient air monitoring and/or soils sampling and analysis, as required under this Item. Verify that the analytical laboratory is American Industrial Hygiene Association (AIHA) accredited for metals analysis, and has successfully participated (previous 12 months at a minimum) in the AIHA ELPAT program.

1.7.4 WORKER PROTECTION (ITEM 556.301)

1.7.4.1 Lead (Toxic Metal) Health and Safety Controls. Submit the following plans, programs, and information to the Department for approval in accordance with 105.02 a minimum of 15 working days prior to exposure to toxic metals. Do not begin any paint disturbance activities until Department approvals have been provided.

1. **Worker Protection Compliance Program.** A written project-specific compliance program, prepared under the direction of, and signed and sealed by, a Certified Industrial Hygienist (CIH), for the protection of Contractor workers (and two Department Representatives) from lead in accordance with 29 CFR 1926.62 and other toxic metals in the paint. Verify that any Subcontractors working for the Contractor are included in the program or in a separate program which meets the requirements of this Item. If Subcontractors are operating under a separate program, include the program with the submittals. If the Contractor proposes to use another professional in lieu of a CIH for this purpose, provide the name, experience, professional degrees, and qualifications of the individual to the Department for approval. Unless written approval is given, only utilize a CIH.
2. Include the name, experience, and qualifications (as required by SSPC QP2) of the competent person who will be making routine inspections of project activities to ensure compliance with the program.
3. **Regulated Area Monitoring and Maintenance.** A written program for establishing and maintaining regulated areas around activities which could generate airborne emissions of lead or other toxic metals. Address the frequency of monitoring that will be undertaken, including details on the siting, calibration, and use of the equipment.
4. **Outside Laundry.** Provide the name, address, and qualifications of the launderer, if one will be used, for the cleaning of reusable clothing. Provide a letter from the laundry indicating that it is permitted to handle clothing contaminated with lead and/or the other toxic metals of concern.
5. **Laboratory Qualifications.** Provide the name of the laboratories and/or firms that will be used for the worker and area exposure monitoring required under this Item. Verify that the analytical laboratory is American Industrial Hygiene Association (AIHA) accredited for metals analysis, and has successfully participated (previous 12 months at a minimum) in the

AIHA ELPAT program. Confirm that the laboratory conducting the worker blood analysis is approved by OSHA.

6. **Personal Protective Equipment and Training for Department Personnel.** Acknowledge that all protective clothing and equipment, laundering or disposal, fit testing as needed, hygiene facilities, and training in accordance with the requirements of 29 CFR 1926.62 will be provided for up to two Department Representatives at each site, unless Section 556, Part I, stipulates another number.

1.7.5 WASTE MANAGEMENT (ITEM 556.401)

1.7.5.1 Waste Handling Plan. Submit a written program that addresses the proper handling and disposal of all waste, including lead-bearing and solvent and paint wastes to the Department for approval in accordance with 105.02. Include the procedures that will be followed for the collection of representative samples of the waste for testing; the testing and analysis procedures that will be used; classification of solvent and paint wastes; the procedures for the site handling, storage, and packaging of the waste; and contingency plans in the event of a spill.

1.7.5.2 Transporter Information. The names, addresses, license or permit numbers, and qualifications of the proposed haulers of hazardous waste, non-hazardous waste, and waste water. Select the transporter from lists available from the NHDES Waste Management Division.

1.7.5.3 Hazardous Waste Disposal Information. Advise legally permitted recycling or waste disposal facilities that bridge paint debris will be generated (e.g. abrasive/paint debris), and identify the toxic metals that the waste will likely contain. Based on that information, request a letter from one or more of the hazardous waste recycling or disposal facilities, stating that the facility can accept this type of waste, is authorized to accept the waste under the laws of the State of residence; has the required capability to treat and dispose of the materials; and will provide or assure the ultimate disposal method indicated on the Uniform Hazardous Waste Manifest. Provide the Department with the original letter signed by a legally authorized representative of the facility.

1.7.5.4 Non-Hazardous and Other Waste Disposal Information. Submit the name and address of the permitted municipal waste landfill that will accept the non-hazardous waste generated by the Contractor.

1.7.5.5 Waste Water. Provide a letter from the proposed facility that will be accepting the waste water for disposal, indicating that the facility has the capability to handle and properly dispose of the water. Advise the facility of all of the toxic metals that may be present in the water. Provide the Department with the original letter signed by a legally authorized representative of the facility.

1.7.5.6 Laboratory Qualifications. Provide the name, address, experience, and qualifications of the laboratory and/or firm that will be used for the waste sampling and analysis required under this Item.

MATERIALS

2.1 GENERAL

[Blank]

2.2 PAINTING EXISTING STRUCTURAL STEEL (ITEM 556.101).

2.2.1 MATERIALS

2.2.1.1 Abrasives.

1. Provide abrasives that are dry and free of oil, grease, and corrosion producing, or other deleterious contaminants. Only recyclable (steel or aluminum oxide) abrasives shall be used for dry abrasive blast cleaning and shall be tested daily (or as otherwise approved) to meet the cleanliness standards of SSPC-AB2.
2. Provide abrasives that are sized to produce a sharp, angular, uniform anchor pattern profile height of 2 to 4 mils (50 to 100 microns), unless the requirements of the coating manufacturer are more restrictive.
3. Provide the abrasives to the jobsite in original packaging or in bulk, and store in a clean, dry environment.
4. For wet abrasive blasting methods provide abrasives meeting SSPC-AB1.

2.2.1.2 Coatings.

1. Provide the type and quantity of coating materials, thinners, and cleaning solvents needed to paint all surfaces as required (see Part I, Table 1.1.3). A listing of pre-approved coating systems is found in Section 556 Part III, 708 Paint.
2. Film thicknesses shall be as shown in the table unless the coating manufacturer's recommended thickness range differs. In such cases, the manufacturer shall provide written documentation that the range cited satisfies the Department's performance requirements.
3. Use coatings that are compliant with Federal and State VOC regulations at the time of application. The maximum VOC limit is 2.8 Lb./Gal. (340 g/L) at the time of application. (See Section 550 Part III, 708 Paint). This includes the use of any required thinners.
4. Use the same manufacturer for all coats on a given structure, including thinners and additives. Do not co-mix coating products or components produced by different manufacturers under any circumstances.
5. Provide each coat of paint in sufficiently contrasting color to facilitate proper coverage and to distinguish it from cleaned steel and previously applied coatings.
6. Order all paint, thinner, and cleaning materials well in advance of intended use. Maintain an adequate supply of all materials on site at all times so as to not delay the work.

COATING AND FILM THICKNESS TABLE

PAINT SYSTEM B:

Primer:	708-NH 1.20 Organic zinc rich primer	3-5 mils DFT	(75-125 microns)
Intermediate:	708-NH 3.21 High build epoxy polyamide	4-6 mils DFT	(100-150 microns)
Stripe coat:	(Intermediate coat)	Uniform Coat	Uniform Coat
Finish:	708-NH 3.81 Aliphatic polyurethane	2-4 mils DFT	(50-100 microns)
	Total system thickness	9-15 mils DFT	(225-375 microns)

PAINT SYSTEM C:

Primer:	708-NH 1.40 Single-component moisture-cure zinc-rich polyurethane	3-5 mils DFT	(75-125 microns)
Intermediate:	708-NH 2.40 Single-component moisture-cure aromatic polyurethane with micaceous iron oxide	3-5 mils DFT	(75-125 microns)
Stripe coat:	(Intermediate coat)	Uniform Coat	Uniform Coat
Finish #1:	708-NH 3.41 Single-component moisture-cure aliphatic polyurethane with micaceous iron oxide	2-4 mils DFT	(50-100 microns)
or			
Finish #2:	708-NH 3.43 Single-component moisture-cure aliphatic polyurethane	2-4 mils DFT	(50-100 microns)
or			
Finish #3:	708-NH 4.42 Single-component moisture-cure aliphatic polyurethane clear antigraffiti finish	1-2 mils DFT	(25-50 microns)
	Total system thickness		

PAINT SYSTEM D:

Primer:	708-NH 1.41 Single-component moisture-cure polyurethane penetrating sealer	1-1.5 mils DFT	(25-38 microns)
Intermediate:	708-NH 2.40 Single-component moisture-cure aromatic polyurethane with micaceous iron oxide	3-5 mils DFT	(75-125 microns)
Stripe coat:	(Intermediate coat)	Uniform Coat	Uniform Coat
Finish #1:	708-NH 3.41 Single-component moisture-cure aliphatic polyurethane with micaceous iron oxide	2-4 mils DFT	(50-100 microns)
or			
Finish #2:	708-NH 3.43 Single-component moisture-cure aliphatic polyurethane	2-4 mils DFT	(50-100 microns)
	Total system thickness	6-10.5 mils DFT	(150-262 microns)

PAINT SYSTEM E:

Primer:	708-NH 1.43 Single-component moisture-cure micaceous iron oxide zinc-rich polyurethane	3-5 mils DFT	(75-125 microns)
Intermediate:	708-NH 2.42 Single-component moisture-cure refined coal tar aromatic polyurethane with micaceous iron oxide	4-6 mils DFT	(100-150 microns)
Stripe coat:	(Intermediate coat)	Uniform Coat	Uniform Coat
Finish:	708-NH 3.42 Single-component moisture-cure refined coal tar aromatic polyurethane with micaceous iron oxide	4-6 mils DFT	(100-150 microns)
	Total system thickness	11-17 mils DFT	(275-425 microns)

PAINT SYSTEM F:

Primer:	708-NH 1.40 Single-component moisture-cure zinc-rich polyurethane	3-5 mils DFT	(75-125 microns)
Sealer:	708-NH 1.41 Single-component moisture-cure polyurethane penetrating sealer	1-1.5 mils DFT	(25-38 microns)
Intermediate:	708-NH 2.40 Single-component moisture-cure aromatic polyurethane with micaceous iron oxide	3-5 mils DFT	(75-125 microns)
Stripe coat:	(Intermediate coat)	Uniform Coat	Uniform Coat
Finish #1	708-NH 3.41 Single-component moisture-cure aliphatic polyurethane with micaceous iron oxide	2-4 mils DFT	(50-100 microns)
or:			
Finish #3:	708-NH 4.42 Single-component moisture-cure aliphatic polyurethane clear antigraffiti finish	1-2 mils DFT	(25-50 microns)
Total system thickness			

PAINT SYSTEM G:

Sealer:	708-NH 1.41 Single-component moisture-cure polyurethane penetrating sealer	1-1.5 mils DFT	(25-38 microns)
Intermediate:	708-NH 2.40 Single-component moisture-cure aromatic polyurethane with micaceous iron oxide	3-5 mils DFT	(75-125 microns)
Stripe coat:	(Intermediate coat)	Uniform Coat	Uniform Coat
Finish #1:	708-NH 3.41 Single-component moisture-cure aliphatic polyurethane with micaceous iron oxide	2-4 mils DFT	(50-100 microns)
Finish #3:	708-NH 4.42 Single-component moisture-cure aliphatic polyurethane clear antigraffiti finish	1-2 mils DFT	(25-50 microns)
Total system thickness			

PAINT SYSTEM H:

Finish #2:	708-NH 3.43 Single-component moisture-cure aliphatic polyurethane	2-4 mils DFT	(50-100 microns)
and			
Finish #2:	708-NH 3.43 Single-component moisture-cure aliphatic polyurethane	2-4 mils DFT	(50-100 microns)
and			
Finish #3:	708-NH 4.42 Single-component moisture-cure aliphatic polyurethane clear antigraffiti finish	1-2 mils DFT	(25-50 microns)
Total system thickness			
		5-10 mils DFT	(125-250 microns)

7. Provide all paint materials in sealed, original, containers that are properly marked and labeled to allow verification with applicable material safety data sheets, application precautions, and instructions. Verify that the labeling includes the manufacturer's name, type of material, brand name, color designation, shelf life, contract or order number under which the material has been ordered, lot and batch numbers, and quantity.
8. Provide a 3 x 6 inch (75 x 150 mm) panel coated with the finish color with the submittals.
9. The finish color, as specified in Part I Table 1.1.3, shall match the required Federal Standard 595 Color number as follows:

SAGE GREEN	Federal Color #	24227
LIGHT (ODOT) GREEN		24272
DARK (DARTMOUTH) GREEN		24109
DARK BROWN		20059
ALUMINUM		27178

184

CONCRETE GRAY	26357
DARK GRAY	26152
BLACK	27038

2.2.1.3 Caulking. Use caulking that is approved by the coating manufacturer in writing, and approved by the Department (see 3.2.7.5).

2.2.1.4 Non-skid grain. Non-skid grains when required for walking surfaces shall be aluminum oxide granules passing No. 18 screen having sharp and angular surfaces similar to metal grit abrasive. The coating manufacturer in writing shall approve the non-skid grain or recommend a comparable substitute.

2.2.2 EQUIPMENT

2.2.2.1 Surface Preparation and Painting Equipment.

1. Provide all brushes, discs, wheels, scrapers, descalers, blast cleaning, and other surface preparation equipment to conduct the work as specified in this Item and Section 556, Part I.
2. Use equipment and materials that are clean and sized properly to accomplish the work, including the required surface profile and finish as required by this Item.
3. Provide paint brushes, rollers, daubers, and spray equipment to conduct the work as specified in this Item and Section 556 Part I.
4. Do not use any equipment that will create noise in excess of 90 decibels at the closest residential, commercial, or recreational area.
5. All equipment and vehicles used in the work shall be maintained in good working order, have functional mufflers, and shall not emit visible pollutants other than during startup. Protective measures shall be used to prevent the equipment's motor oil, hydraulic fluids, coolants, etc. from fouling the pavement or the ground. Any damage to the pavement surface due to detrimental fluid spills shall be repaired at the Contractor's expense.
6. The Contractor shall assign an employee the duties of a "safety spotter" who shall be stationed on the roadway at the bridge outside of containment to assess safety, traffic, and operational compliance of work operations. The Contractor shall provide and maintain effective contact at all times with worker(s) inside enclosures or on scaffolding to provide communication and permit work to stop immediately if a safety problem, pollution release, traffic contingency, or emergency requires it.

2.2.2.2 Personal Protective Equipment.

1. Provide all of the necessary personal protective equipment (PPE) for the project to assure that workers are protected from hazards during surface preparation, coating application, and clean-up activities. Include equipment for up to two Department Representatives per shift.
2. Repair or replace PPE as required to assure that it continues to provide its intended purpose.

185

2.2.2.3 Inspection Equipment

1. Provide all of the inspection and testing equipment needed to verify the quality of the entire surface preparation and painting process, including mirrors to inspect hard to reach areas.
2. Make the equipment available for use by the Department.

2.3 CONTAINMENT & ENVIRONMENTAL PROTECTION (ITEM 556.201).

2.3.1 CONTAINMENT MATERIALS AND EQUIPMENT

2.3.1.1 Supply all equipment and materials needed to contain project debris in accordance with the provisions of this Item. This includes, but is not limited to, the following as applicable to the project: ground covers, rigging, scaffolding, planking, containment materials, dust collection and ventilation equipment, and High Efficiency Particulate Air (HEPA) vacuums.

2.3.1.2 When dust collection is required, provide equipment with a filtration efficiency of 99.5% at 0.5 microns. Only use dust collectors which have an integral differential pressure gage for monitoring static pressure drop across the filter bank.

2.3.1.3 Use materials that are free of loose dust and debris both when brought onto the bridge site, and upon removal. Comply with Item 556.401 for the Toxicity Characteristic Leaching Procedure (TCLP) testing and disposal of materials that will not be reused.

2.3.1.4 Provide and collect all water used for the cleaning of surfaces, materials and equipment. Comply with Item 556.401 for proper disposal of the water.

2.3.1.5 Provide two (2) hand held portable lights, capable of minimum of 200 foot candles illumination, and a light meter at the work site for use by the Department.

2.3.1.6 Provide at least two (2) communication devices for use in providing two-way communication at all times between the outside and inside of the containment or scaffold system.

2.3.1.7 Provide wind meters or weather monitoring station to monitor wind speeds at the containment.

2.3.2 MONITORING, TESTING, AND SAMPLING EQUIPMENT

2.3.2.1 **Air Monitoring Equipment.** Provide all equipment necessary for the monitoring of airborne emissions around the project in accordance with the provisions of this Item:

1. Personal sampling pumps (1 to 4 liter per minute flow rate) or high flow area sampling pumps (10 to 15 liter per minute flow rate) for monitoring the regulated areas.
2. High Volume Ambient Air Monitors equipped with Total Suspended Particulate (TSP) collection heads (when monitoring is specified).
3. Calibration equipment.
4. Adequate supply of filter cassettes and filters.

186

5. All equipment (e.g. generators, power cords, fuel, etc.) needed to operate the pumps and monitors.

2.3.2.2 Use equipment that is free of loose dust and debris both when brought onto each bridge site, and upon removal.

2.3.3 **RAPID DEPLOYMENT METHODS** - (See Section 556 Part I). [blank]

2.4 WORKER PROTECTION (ITEM 556.301).

2.4.1 MONITORING AND TESTING EQUIPMENT

2.4.1.1 Supply the instrumentation needed for the monitoring of worker exposures (low flow personal pumps at 1-4 liters per minute and calibration standard) including all equipment needed for its operation (e.g. generators, batteries, power cords, fuel, etc.).

2.4.1.2 Use equipment that is free of loose dust and debris when brought onto the bridge site, and upon removal.

2.4.2 PERSONAL PROTECTIVE EQUIPMENT, HYGIENE FACILITIES, AND WATER

2.4.2.1 Provide all personal protective clothing and equipment (PPE) needed for Contractor workers, and for Department Representatives as specified, including proper cleaning and disposal.

2.4.2.2 Provide all water required for drinking and hygiene purposes.

2.4.2.3 Repair or replace PPE as required to assure that it continues to provide its intended purpose.

2.4.2.4 Use PPE and hygiene facilities that are free of loose dust and debris both when brought onto each bridge site, and upon removal. Properly handle and dispose of all hygiene water, cleaning materials, and PPE that cannot be cleaned for reuse. Comply with Item 556.401 for disposal.

2.5 WASTE MANAGEMENT (ITEM 556.401).

2.5.1 WASTE CONTAINERS

2.5.1.1 **Hazardous Waste.** Provide US DOT-approved containers of the appropriate size and type for the hazardous waste generated on the project. Use containers that are resistant to rust and corrosion (painted, if constructed of steel), that have tight fitting lids or covers, and which are water resistant and leak proof. Verify that the containers are acceptable to the disposal facility.

2.5.1.2 **Municipal/Construction Waste.** Provide all containers for non-hazardous municipal / construction waste. Use containers that are free of loose debris when brought on-site.

2.5.1.3 **Spent Solvents.** Provide all containers for spent solvents and paint wastes. Do not mix spent solvents with spent abrasives, paint debris, water, or other waste.

2.5.2 CONTAINER MAINTENANCE

2.5.2.1 Maintain all containers in good operating condition with all lids and closing mechanisms intact and operational to prevent the escape of debris by wind, spilling of the contents, or access by unauthorized personnel.

188

CONSTRUCTION REQUIREMENTS

3.1 GENERAL.

3.1.1 SPECIFICATIONS.

3.1.1.1 The construction of the work shall be performed in conformance with the requirements of the reference standards (1.6) except as modified by this specification and the manufacturer's specifications, whichever is most stringent.

3.1.2 CONTRACTOR QUALIFICATIONS.

3.1.2.1 All painting contractors and painting subcontractors painting structural steel which involves the removal or overcoating of lead-based paint shall be certified by SSPC to QP1 and QP2 before the day of bid opening and shall maintain certification and certified representation on site throughout the duration of the project until final acceptance of the work.

3.2 PAINTING EXISTING STRUCTURAL STEEL (ITEM 556.101).

3.2.1 SAFETY & QUALITY CONTROL

3.2.1.1 Conduct all Work in strict accordance with the relevant OSHA 29 CFR 1926 regulations, and the safety and protection requirements stipulated by the equipment and material manufacturers.

3.2.1.2 Comply with the additional specialized measures identified in Item 556.301 regarding the removal or disturbance of paints containing lead or other toxic metals.

3.2.1.3 Quality Control. The applicator (i.e. field painting contractor) is required to conduct and document quality control inspection of the cleaning and painting operations on a daily basis by an individual meeting the requirements of SSPC QP1, including at a minimum, all measurements required by SSPC QP1 and those specified in 3.2.10.

3.2.2 CONTAINMENT, PROTECTION OF SURFACES, AND RESTITUTION

3.2.2.1 Contain the surface preparation and painting operations to avoid contamination of surrounding property and newly applied coatings. Use extreme diligence to assure that vehicles, equipment, hardware, fixtures, surrounding property, and other materials are protected against abrasive impact, paint spillage, overspray, falling objects, and other damage. Extreme care must be taken in this regard to contain overspray. The Department reserves the right to prohibit spray painting if the Contractor does not demonstrate proper diligence in containing overspray. Make full restitution for damages caused at no additional cost to the Department.

3.2.2.2 Requirements for containment when removing paints that contain lead or other toxic metals are found in Item 556.201.

3.2.2.3 Use protective coverings, shields, or masking as necessary to protect surfaces that have been recently coated and areas that are not designated to receive surface preparation or coating, including nameplates, electrical equipment, bridge substructure, highway appurtenances, and slope protection.

189

3.2.2.4 Maintain all protective coverings during the entire period the work is being performed, and remove all coverings upon completion of the work.

3.2.2.5 Erect all scaffolding and staging required for the work and remove it upon project completion. Perform all work activities with extreme care in fastening, bracing, and handling the scaffolding and staging to avoid scratching, gouging, or damaging bridge surfaces and surrounding property and equipment. Use "softeners" as necessary. Repair any damage created to the bridge to the satisfaction of the Department and at no cost to the Department.

3.2.3 NOISE

3.2.3.1 Measure the noise from all representative operations at the beginning of the project, in the event of complaints, and as directed by the Department.

3.2.3.2 Conduct the initial measurements at the closest residential, commercial, or recreational areas.

3.2.3.3 Undertake corrective measures, as approved by the Department, to reduce noise from Contractor's operations that is measured in excess of 90 decibels.

3.2.3.4 Work involving high noise machinery, such as abrasive blasting and dust collection equipment, shall only run or operate between the hours of 7:00 a.m. and 7:00 p.m. daily, unless otherwise permitted by the Department and with the concurrence of the Town.

3.2.4 TECHNICAL REPRESENTATION BY COATING MANUFACTURER

3.2.4.1 Arrange for a technical representative (not a sales representative) of the paint manufacturer to inspect the Work to verify that the quality of surface preparation and cleaning are satisfactory for the coating system, that the mixing and application are satisfactory, and that the coating system will perform as expected.

3.2.4.2 Arrange for a minimum of one visit at or around production start-up. If the Work is shut down over a winter, require an additional visit at the commencement of the Work in the following spring. Provide the Department with a minimum of two days advance notice before the trips are made.

3.2.4.3 Have the manufacturer summarize the results of each inspection in writing, together with recommendations. Provide the report to the Department within one week of the representatives' visit.

3.2.5 SURFACE PREPARATION

3.2.5.1 Surface Preparation Plans

1. Prepare all surfaces in accordance with the requirements of Section 556, Part I, this Item, and the approved Surface Preparation/Painting Plan provided under 1.7 "Submittals."
2. When removing coatings containing lead or other toxic metals, control emissions and reduce worker exposures to lead and other toxic metals in accordance with the requirements identified in Item 556.301.

3.2.5.2 Pre-Production Surface Preparation Test Section.

1. Prior to proceeding with production surface preparation operations, prepare a minimum of one test section at least 10 square feet in size for each of the specified degrees of cleaning (e.g. SP10, SP3, SP7, etc.). The test section should include typical overlapping joints and riveted/bolted connections. Conduct the cleaning in a location(s) approved by the Department in writing.
2. Use the same equipment, materials, and procedures for the test section(s) that will be used for the production operations.
3. Provide safe access for close visual inspection and testing. SSPC-VIS 1 and VIS 3 photographic standards as applicable may be used as an aid in defining the final surface appearance.
4. Do not proceed with production surface preparation activities until the Department agrees that the test section(s) conform to the cleanliness requirements of this Item.
5. The Department may take site-specific photographs of the approved SP 10 test section for use on the project. Use the site-specific photographs of the approved test sections together with SSPC-Vis 1 and the written surface preparation specifications as the standard of cleaning for the project. If all parties agree, the site-specific photographs may be used in place of SSPC-Vis 1. In the event of a conflict between the site-specific photographs, SSPC-Vis 1, and the written definitions, the written definitions will prevail.

3.2.5.3 Removal of Existing Debris. Remove and properly dispose of accumulated pigeon droppings, cinders, dirt, and debris from all areas to be prepared and painted prior to undertaking any coating removal or surface preparation operations.

3.2.5.4 Sharp Edges and Holes. [blank]

3.2.5.5 Removal of Pack Rust

1. Remove all rust scale on any surface and all loose pack rust that has formed between structural members. Unless otherwise directed by the Department, remove tight pack rust until the highest point is a minimum of 1/8 inch (3.2 mm) below the surface of the surrounding steel. Pay particular attention to the crevice areas at steel connection points.
2. Where pack rust cannot be removed or as directed by the Department, apply caulking in accordance with 3.2.7.5.
3. Exercise extreme care to avoid any nicking or gouging of the steel during removal. Nicks and gouges are cause for a suspension of activities until appropriate adjustments are made to prevent a recurrence. Damage to steel shall be repaired by the Contractor as directed by and at no cost to the Department.

3.2.5.6 Steel Defects

1. Immediately report to the Department any cracks or significant metal loss found in the structural steel.

191

2. Provide the Department with access to the suspect areas as needed to conduct an investigation.
3. After surface preparation (especially after blast cleaning), all visually evident detrimental surface imperfections which remain (e.g. fins, slivers, scabs, tears, laminations, projections, weld spatter, knife edges caused by corrosion, etc.) shall be removed by grinding to produce an acceptable surface and the surface profile of the repair area restored to an SSPC-SP 11 condition. The cost shall be subsidiary to Item 556.101.

3.2.5.7 Compressed Air Cleanliness

1. Provide compressed air that is free from moisture and oil contamination.
2. Conduct a white blotter test in accordance with ASTM D 4285 to verify the cleanliness of the compressed air. Conduct the test at least once per shift for each compressor system. Sufficient freedom from oil and moisture is confirmed if soiling or discoloration is not visible on the paper.
3. If air contamination is evidenced, change filters, clean traps, add moisture separators or filters, or make other adjustments as necessary to achieve clean, dry air.

3.2.5.8 Ambient Conditions. Do not conduct final surface preparation which exposes bare steel under damp environmental conditions, or when the surface temperature is less than 5°F above the dew point temperature of the surrounding air, except as permitted otherwise by the coating manufacturer. See 3.2.7.6.(3).

3.2.5.9 Surface Cleaning Requirements -Steel Substrates. Section 556 Part I 1.1.3.2 and Table 1.1.3, identifies the degree of cleaning required for the project. The required cleaning method(s) apply to all surfaces specified. Definitions for the specified degree(s) of cleaning are provided below:

1. SSPC-SP12 Low Pressure Water Cleaning (LP WC)

- a) Remove all dirt, dust, insect and animal nests, bird droppings, and other foreign matter from surfaces to be painted (specified in 1.1.3, Scope of Work), and clean all surfaces to be painted in accordance with SSPC-SP12 low pressure water cleaning (LP WC). Use 4,500-5,000 psi (31-34 MPa) pressure with a zero-degree rotary nozzle. The nozzle shall be placed no more than 8 inches from the surface and held perpendicular to it. Add an approved biodegradable liquid soluble-salt remover to the water and follow the manufacturer's recommendations (see 3.2.5.11).
- b) Wash water containing paint chips shall not be allowed to fall uncollected from the bridge during the wash, but shall be collected, screened through water permeable tarps (formed or woven with openings less than 25 mils), and pumped through 50 and 5 micron filters in series prior to analysis and proper disposal.

2. SSPC-SP 1 Solvent Cleaning

- a) Remove all visible oil, grease, dust, soil, drawing and cutting compounds, and other soluble contaminants from surfaces (specified in 1.1.3, Scope of Work) in conformance

to SSPC-SP 1, Method 4.1.1 only, prior to coating removal (with emphasis on using clean rags or brushes).

- b) Only use solvents or detergents that are acceptable to the coating manufacturer in writing and the Department.

3. SSPC-SP 2 Hand Tool Cleaning

- a) Upon approval of the Department, use scrapers, putty knives, wire brushes, chipping hammers and other similar tools to thoroughly clean any surfaces that cannot be adequately addressed using abrasive blasting or power tool cleaning. Comply with the requirements of SSPC-SP 2 to remove all loose mill scale, loose rust, loose paint, and other loose foreign matter on a best effort basis.
- b) It is not intended that adherent mill scale, rust, and paint be removed by this process. Mill scale, rust, and paint are considered to be adherent if they cannot be removed by lifting with a dull putty knife.
- c) SSPC-VIS 3 may be used as an aid in determining the quality of cleaning.

4. SSPC-SP 3 Power Tool Cleaning

- a) Use power tools such as sanding discs or non-woven open-web abrasive rotary discs, needle guns, descalers, rotary impact tool with rotopeen flaps, or similar tools to thoroughly clean corrosion and disbanded coating on surfaces specified in 1.1.3, Scope of Work, and Section 556 Part I. Do not burnish surfaces with power wire brushes. Comply with the requirements of SSPC-SP 3 to remove all loose mill scale, loose rust, loose paint, and other loose foreign matter.
- b) It is not intended that adherent mill scale, rust, and paint be removed by this process. Mill scale, rust, and paint are considered adherent if they cannot be removed by lifting with a dull putty knife.
- c) Feather the coating surrounding each prepared area with a non-woven open-web abrasive disc to provide a smooth tapered transition into the surrounding existing intact coating. Verify that the edges of the coating around the periphery of the prepared areas are tight and intact by probing with a putty knife in accordance with the requirements of SSPC-SP3.
- d) SSPC-VIS 3 may be used as an aid in determining the quality of cleaning.

5. SSPC-SP 7 Brush-off Blast Cleaning

- a) When abrasive blast cleaning preparation of the newly applied coating is required for the purposes of overcoating or repair, thoroughly clean all surfaces designated by the Department. Comply with the requirements of SSPC-SP 7 to remove all loose paint, loose rust, loose mill scale, and other foreign matter. Verify that the surfaces have been exposed to the abrasive and that the surfaces are densely and uniformly roughened.

- b) It is not intended that adherent paint be removed by this process. Paint is considered to be adherent if it cannot be removed by lifting with a dull putty knife. Verify that the edges of remaining paint are feathered or prepare as per 3.2.5.9 (4c).
- c) Unless restricted otherwise by the Department, accomplish the SP 7 degree of cleaning using any of the following: dry blast cleaning with recyclable abrasives, wet abrasive blast cleaning, water jetting with abrasive injection, or vacuum blast cleaning.
- d) SSPC-VIS 1 may be used as an aid in determining the quality of cleaning.

6. SSPC-SP 11 Power Tool Cleaning to Bare Metal

- a) Use power assisted hand tools such as needle guns, Roto peening equipment, or similar tools to thoroughly clean all surfaces specified in 1.1.3, Scope of Work. Comply with the requirements of SSPC-SP 11 to remove all visible oil, grease, dirt, dust, mill scale, rust, paint, oxide, corrosion products, and other foreign matter. Slight residues of rust and paint may be left in the lower portions of pits if the original surface is pitted.
- b) Produce or retain a minimum surface profile of 1 mil (25 microns) on all prepared surfaces or a profile of greater depth if required by the coating manufacturer or the Department. Measure the surface profile using the Testex Replica Tape in accordance with ASTM D4417 Method C, noting that the appearance of a profile resulting from a power tool cleaning is different from one created by abrasive blast cleaning.
- c) Feather the coating surrounding each prepared area with a non-woven open-web abrasive disc to provide a smooth tapered transition into the surrounding existing intact coating. Verify that the edges of the coating around the periphery of the prepared areas are tight and intact by probing with a putty knife in accordance with the requirements of SSPC-SP3.
- d) SSPC-VIS 3 may be used as an aid in determining the quality of cleaning.

7. SSPC-SP 10 Near-White Blast Cleaning

- a) Thoroughly blast clean all surfaces specified in 1.1.3, Scope of Work. Comply with the requirements of SSPC-SP 10 to remove all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter, except for staining.
- b) Provide a surface profile of 2 to 4 mils (50 to 100 microns) for abrasive blast cleaning unless the requirements of the coating manufacturer are more restrictive. Measure the surface profile using extra course Testex Replica Tape in conformance to ASTM D4417, Method C, at least once per shift, and when the abrasive mixture is changed.
- c) Allow staining to remain on no more than 5 percent of each nine square inch increment of surface area. Acceptable staining is limited to light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale, or stains of previously applied paint.
- d) Accomplish the SSPC SP10 degree of cleaning using dry blast cleaning with recyclable abrasives, wet abrasive blast cleaning, or vacuum blast cleaning. When using wet

methods of preparation, provide information from the coating manufacturer regarding the use of an inhibitor to prevent flash rusting of the steel. Use an inhibitor only upon approval of the Department. Allow the surface to thoroughly dry prior to painting, and apply the primer before any visible rusting occurs.

- e) SSPC-VIS 1 or site-specific photographs will be used as an aid in determining the quality of cleaning.

8. SSPC-SP12/ Ultra High Pressure Water Jetting (UHP WJ)

- a) All designated steel surfaces (see 1.1.3 scope of work) shall be cleaned to the degree specified by Ultra High Pressure Water Jetting (> 25,000 psi) in conformance with SSPC-SP12.
- b) Use clean potable water. Filter and recycle the water to minimize the volume of waste. Provide a new source of water as needed.
- c) If required to comply with the requirements of SSPC-SP12 WJ 2, remove all visible oil, grease, dirt, dust, rust, paint, layered corrosion products, and other foreign matter, except for staining. All staining to remain on no more than 5 percent of the surface area. An acceptable clean surface area has a matte (dull, speckled) finish, which is free of oil, grease, paint, and rust except for randomly dispersed stains of rust, paint, and other foreign matter. Patches of light black iron oxide complex that is often found beneath pack rust is allowed.
- d) Surfaces cleaned to bare metal using water jetting will flash rust soon after they are cleaned. Photo C WJ-2L of SSPC Vis 4 depicts the amount of light flash rusting which is allowable. The use of a rust inhibitor is not permitted.
- e) For water jet cleaned surfaces, a light amount of flash back rusting may occur, but in no case allow prepared surfaces to stand for more than 8 hours prior to painting. Reclean surfaces that have stood for more than 8 hours or have more than a light amount of surface rust present.
- f) Cleaned surfaces shall be dry and free of loose (powder) flash rust before painting. Flash rust is considered to be loose if it comes off when hand rubbed (white glove test) or when adhesive tape is applied and pulled off. The coating manufacturer shall approve in writing the degree of flash rust permitted before painting.
- g) Verify that the edges of remaining paint are feathered or prepared as per 3.2.5.9 (4c).

9. SSPC-SP14/ Industrial Blast Cleaning

- a) All designated steel surfaces (see 1.1.3 scope of work) shall be cleaned in conformance with SSPC-SP14.

10. SSPC-SP15/ Commercial Grade Power Tool Cleaning

- a) Use power tools such as coated abrasive discs, needle guns, rotary impact flap equipment, or similar tools to thoroughly clean all surfaces specified in 1.1.3, Scope of

Work. Comply with the requirements of SSPC-SP 15 to remove all visible oil, grease, dirt, rust, coating, oxides, mill scale, corrosion products, and other foreign matter, except as noted. Random staining shall be limited to no more than 33% of each unit area. Staining may consist of light shadows, slight streaks, or minor discolorations caused by stains of rust, mill scale, previously applied coating. Slight residues of rust and paint may also be left in the bottoms of pits if the original surface is pitted.

- b) Produce or retain a minimum surface profile of 1 mil (25 microns) on all prepared surfaces or a profile of greater depth if required by the coating manufacturer or the Department. Measure the surface profile using the Testex Replica Tape in accordance with ASTM D4417 Method C, noting that the appearance of a profile resulting from a power tool cleaning is different from one created by abrasive blast cleaning.
- c) Feather the coating surrounding each prepared area with a non-woven open-web abrasive disc to provide a smooth tapered transition into the surrounding existing intact coating. Verify that the edges of the coating around the periphery of the prepared areas are tight and intact by probing with a putty knife in accordance with the requirements of SSPC-SP3.
- d) SSPC-VIS 3 does not currently have guidance photographs. SP15 differs from SP11 in that stains of rust, paint, or mill scale may remain on the surface.

3.2.5.10 Surface Cleaning Requirements - Bolts

1. Remove machine oil, lubricant or residuals from the surface of new installed black or galvanized bolts by solvent cleaning in conformance to SSPC-SP 1.
2. Supplement the solvent cleaning of galvanized bolts by hand or power tool cleaning in conformance to SSPC-SP 2 or SSPC-SP 3 as needed to remove insoluble contaminants such as white rust and to thoroughly roughen the entire surface without removing the zinc layer. An additional pre-treatment or tie coat may be required if recommended by the paint manufacturer and approved by the Department. A clean white cloth wipe test may be used to confirm that all lubricant and non-absorbed dye has been removed, leaving only the residual "stain" on the surface.
3. Supplement the solvent cleaning of rusted black bolts by power tool cleaning in conformance to SSPC-SP 3. Use a 2 3/4 inch diameter knot wire cup brush as manufactured by Weiler Corporation and supplied by Grainger Industrial Supply, or non-woven open-web abrasive rotary discs sander, unless other methods are approved by the Department.

3.2.5.11 Remediation of Chlorides

1. Verify that residual chlorides across the entire bridge (e.g. in previously rusted areas as well as unrusted areas) are remediated to a surface cleanliness condition of SC-2 in accordance with SSPC-SP12, as determined by the Chlor*Test™ as manufactured by Chlor*Rid International Inc. (Tel. 800-422-3217). Conduct testing according to manufacturer's instructions and after surface preparation.
2. Methods of removing chlorides may include, but are not limited to, steam cleaning or pressure washing and scrubbing before or after initial paint removal, abrasive blast cleaning

the steel and allowing it to rust overnight followed by reblasting, blast cleaning with blends of fine and course abrasives, or wet abrasive blast cleaning. Describe the proposed method(s) of chloride remediation in the submitted Surface Preparation/Painting Plan.

3. Test for chlorides at a minimum of xxx locations per containment enclosure (see Part I). Test locations are to be determined by the Department.
4. If unacceptable levels of chloride remain, reclean the affected areas until acceptable results are achieved.

3.2.6 PAINT STORAGE, MIXING, AND HANDLING

3.2.6.1 Paint Storage

1. Store all flammable materials in approved storage containers at locations approved by the Department. Do not locate storage containers closer than 50 feet (15.2 m) from any building. For proximity to the bridge see the Prosecution of Work.
2. Store all paint, thinners, and solvents in accordance with OSHA regulations and the requirements of the paint manufacturer. Store the paint and solvents under cover, out of direct sunlight, and protected from vandalism.
3. Maintain the storage temperature between 40°F and 90°F (5°C and 33°C), unless the requirements of the manufacturer are more restrictive.
4. Provide the size and number of fire extinguishers in proper proportion to the quantity of paint stored.
5. Use explosion-proof lighting fixtures in the storage area.
6. Do not permit smoking in paint storage, mixing, and application areas.
7. Keep all containers of paint unopened until required for use.
8. Do not open or mix paints in the storage area.
9. Do not return mixed paints to the storage area.
10. Equip bulk containers for solvents and thinners with spring-loaded, self-closing, dispensing nozzles and Underwriter's Laboratories approved drum bung vents. Use Underwriter's Laboratories approved containers for transporting paint to mixing areas.
11. Do not permit the accumulation of empty paint cans, combustibles, and other debris.
12. Maintain MSD sheets for all materials.

3.2.6.2 Mixing and Thinning of Coating Materials

1. Verify that the paint to be mixed has not exceeded its shelf life. When required by the manufacturer, warm paints stored at less than 50°F (10°C) to above 50°F (10°C) prior to mixing.
2. Utilize proper ventilation in the mixing area to prevent injury to workmen or the accumulation of volatile gases.
3. Mix all coatings in accordance with the requirements of the coating manufacturer using mechanical equipment such as a Jiffy mixer. Do not create a vortex when using the power mixer.
4. Do not thin any paints unless approved in writing by the paint manufacturer and the Department. If thinning is required and authorized, use only those types, brands, and amounts of thinner stipulated by the coating manufacturer. Carefully measure the amount of thinner added. Do not "eye ball."
5. Strain materials after mixing to remove agglomerations.

3.2.7 COATING APPLICATION

3.2.7.1 Painting Plans. Apply all coatings in accordance with the requirements of this Item, the coating manufacturer's instructions, and the approved Surface Preparation/Painting Plan provided under 1.7 Submittals.

3.2.7.2 Applicator Proficiency. Unless directed otherwise by the Department, have each applicator demonstrate his or her proficiency in applying the coating system to test areas prior to commencing the production application.

3.2.7.3 Quality of Surface Preparation Prior to Painting

1. Verify that the surface exhibits the specified degree of hand, power tool, or abrasive blast cleaning immediately prior to painting.
2. Apply the first coat before rusting or degradation of the surface occurs, but in no case allow the prepared surface to stand for more than 8 hours prior to painting. Reclean rusted or degraded surfaces, or those surfaces that have stood for more than 8 hours prior to painting.

3.2.7.4 Surface Cleanliness Prior to Painting and Between Coats

1. Thoroughly clean the surface of each coat prior to the application of the next to remove spent abrasive, dirt, dust, cement spatter, and other interference material. Comply with the requirements of Item 556.301 for the special restrictions on using compressed air for cleaning when removing paints that contain lead or other toxic metals.
2. If grease or oil have become deposited on the bare steel or on the surface of any of the applied coats, remove by solvent cleaning in accordance with SSPC-SP1 prior to the application of the next coat. Use solvents that are compatible with the coating being cleaned. Upon completion of the cleaning, verify that the grease and oil have been removed by wiping

the surface with a clean, white cloth and inspecting the cloth for residue. If a residue is visible on the cloth, conduct additional cleaning.

3. Prior to applying a spot prime coat to areas of hand or power tool surface preparation, verify that the existing coatings have been thoroughly cleaned in the overlap areas, and that pockets are dry and free of mud, dirt, and other accumulations.

3.2.7.5 Caulking

1. Unless otherwise directed by the Department, caulking is required to seal all crevices and gaps between abutting surfaces greater than 0.03 (1/32) inch (0.79 mm) wide and all areas where pack rust had formed between members, whether or not it was completely removed.
2. Identify the caulking materials to be used in the pre-project submittals. Use only caulking materials that are acceptable to the paint manufacturer and the Department.
3. Apply caulking after the application of the prime coat and prior to the application of the intermediate coat.
4. Mix and install the caulking in strict accordance with the approved Surface Preparation/Painting Plan and the caulking manufacturer's instructions.

3.2.7.6 Ambient Conditions During Coating Application. Apply coatings under the following conditions unless the requirements of the coating manufacturer are more restrictive. Do not apply coatings under less restrictive conditions without written approval of the coating manufacturer, and specific written authorization from the Department.

1. Surface and Air Temperatures – Between 40°F (5°C) and 100°F (38°C). For coating system C, D, and E the low temperature is 35°F (2°C).
2. Relative Humidity – Less than 85%. For coating system C, D, and E, R.H. less than 98%.
3. Dew Point – Surface temperature above the dew point. Normal dew point restrictions apply (i.e. 5 °F (2.7°C) spread). For coating systems C, D, and E the restriction is 2°F (1°C), and do not apply the coating to surfaces that are visibly damp.
4. Frost/Rain - Do not apply coatings to surfaces containing frost or free standing water, or during rain, fog, or similar detrimental weather conditions. Apply only to surfaces that are thoroughly dry.
5. Remove and replace any paint that is exposed to unacceptable conditions (e.g. rain) prior to adequate curing.

3.2.7.7 Methods of Application - Apply all coats by the methods shown below, unless the methods recommended by the paint manufacturer are more restrictive.

1. Brush application. Use round or oval brushes. Use flat brushes only on large plate surfaces between connections, and only upon approval of the Department. Brush apply the paint using a series of small circles to thoroughly fill in all surface irregularities, and end with a

series of parallel strokes to smooth the finish. Use brushes or daubers to apply stripe coats and to work the coating into cracks, crevices, blind areas of all rivets and bolts, and all other areas inaccessible to spray application.

2. Roller application. Use rollers only on large plate surfaces between connections, and only upon approval of the Department. Select a nap size and roller quality that will properly wet the substrate and produce a smooth, uniform film. Apply the coating in a such a manner as to achieve complete and thorough coverage of the surface and all irregularities. Back-roll the surface after application to create a smooth, uniform finish.
3. Daubers. On metal surfaces that are inaccessible for paint brushes, use sheepskins or daubers especially constructed for the purpose. Use brushes or daubers to apply stripe coats and to work the coating into cracks, crevices, blind areas of all rivets and bolts, and all other areas inaccessible to spray application.
4. Airless or conventional spray application. If conventional spray is approved for use, verify that the compressed air supply is clean and dry as determined by the blotter test in accordance with ASTM D 4285. When spraying, use extreme care and appropriate containment to avoid contamination of surrounding areas or property by overspray.

3.2.7.8 Recoat Times

1. Apply each coat only after the previous coat has been allowed to dry as required by the manufacturer's written instructions, but as soon as possible to minimize the length of time that the coating is exposed to dust and contamination.
2. Do not allow any coat to remain exposed for longer than 14 days prior to overcoating.
3. If a coat is exposed over the winter months prior to the application of the next coat, or the applied coat(s) exceed the manufacturer's maximum recoat times or 14 days for any reason, remove and replace the coating. As an alternative, provide written instructions from the coating manufacturer for the specialized preparation that can be undertaken (e.g. scarifying the surface) to properly prepare the surface to receive the next coat. The specialized steps can be undertaken only if approved by the Department. Perform the specialized cleaning or removal and replacement of the coatings at no additional cost to the Department.

3.2.7.9 Coverage, Continuity, Stripe Coating, and Finish

1. Apply each coat in a workmanlike manner to assure thorough wetting of the substrate or underlying coat, and to achieve a smooth, streamline surface relatively free of dryspray, overspray, and orange peel. Shadow-through, pinholes, bubbles, skips, misses, lap marks between applications, or other visible discontinuities in any coat are unacceptable. Runs or sags may be brushed out while the material remains wet. Runs, drips and sags that have dried shall be removed by sanding, the surface retextured manually or with power tools and recoated.
2. Remove dryspray and overspray (e.g. by sanding) prior to the application of the next coat. When present on the finish, remove as directed by the Department and apply another coat of finish to the area. Remove all other defective coating to sound material and reapply.

3. Thoroughly coat all surfaces with special attention to hard-to-reach areas, and irregular surfaces such as lacing bars and rivets. When coating configurations such as bolts, rivets, stiffeners, etc. spray apply the material from multiple directions and use brushes and daubers to work the coating into all areas and assure complete coverage.
4. Apply a stripe coat using the intermediate coating material by brush, roll or spray to all edges and outside corners, and by brush to all welds, snipes, crevices, rivets, bolt nuts and threads, bolt heads, and other surface irregularities prior to the application of the full intermediate coat. Apply the stripe coat to ensure complete and uniform coverage, and to build up the thickness of the coating on the irregular surfaces.
5. At the completion of the work painted surfaces, especially fascia surfaces exposed to public view, shall be clean, neat, undamaged, and present a uniform, acceptable appearance to the satisfaction of the Department.

3.2.7.10 Tint - Tint successive coats (if approved by the manufacturer), or use materials of sufficiently different color to facilitate proper coverage and to provide a visual distinction from cleaned steel and between coats.

3.2.7.11 Coating Adhesion

1. Apply all coats in such a manner to assure that they are well adherent to each other and to the substrate. If the application of any coat causes lifting of an underlying coat, or there is poor adhesion between coats or to the substrate, remove the coating in the affected area to adjacent sound, adherent, coating, and reapply the material.
2. If adhesion is suspect, conduct adhesion tests in accordance with ASTM D 3359 or ASTM D 4541 as directed by the Department, and repair all test areas. The Department and the coating manufacturer will establish the acceptance criteria for the testing. Replace all defective coating that is revealed by the testing, at no cost to the Department.

3.2.7.12 Wet Film Thickness. Use wet film thickness gages in accordance with ASTM D4414 to verify the thickness of each coat at the time of application.

3.2.7.13 Dry Film Thickness and Corrective Action for Thickness Deviations

1. Apply each coat to the thicknesses specified in the 2.2.1 to a dry film thickness as measured above the top surface of the substrate profile peaks per SSPC-PA2, Type 2.
2. Measure the thickness of each coat using nondestructive magnetic dry film thickness gages. Comply with SSPC-PA2 for the calibration and use of gages and the minimum frequency of thickness measurements. QA Inspectors will not be limited by the frequency of thickness measurements of PA2 but will take measurements sufficient to assure that proper thickness is achieved on all surfaces as specified.
3. Measure the thickness of each coat applied to non-ferrous metal substrates using nondestructive thickness gages in accordance with ASTM D1400.
4. If there are questions regarding the non-destructive measurements of coating thickness, a Tooke Gage (destructive scratch gage) may be used when authorized by the Department.

Conduct measurements in accordance with ASTM D 4138, but limit the use of the gage to a minimum of locations. Mark and repair all damage caused by the destructive testing, whether created by the Department or the Contractor at no cost to the Department.

5. Apply additional coating of the same type to areas of insufficient thickness. Use care during application to assure that all repairs blend in with the surrounding material.
6. Unless directed otherwise by the Department in writing, remove excessive coating thickness and reapply the affected coat(s).

3.2.7.14 Non skid walking surfaces.

During the application of the first finish coat the non-skid abrasive shall be immediately broadcast onto the surface over the wet layer of coating to provide a non-slip surface. Vacuum excess granules upon curing of the coating. After the first finish coat has cured, apply one additional encapsulation coat of the finish coat to the non-skid surfaces. The DFT of the encapsulation coat will be 2.5 - 3.5 mils (60-90 microns).

3.2.8 REPAIR OF FIELD WELDS, DAMAGED AND UNACCEPTABLE NEWLY APPLIED COATINGS

3.2.8.1 Surface Preparation of Localized Areas

1. Repair field welds, localized handling and erection damage, rigging and containment attachment points, minor coating defects, corrosion, and unacceptable coatings at no additional cost to the Department.
2. Prepare the surface by solvent cleaning in accordance with SSPC-SP 1 prior to mechanical cleaning.
3. In areas previously blast cleaned, if the damage exposes the substrate, remove all loose material and prepare the steel in accordance with SSPC-SP 11. Follow with solvent cleaning in accordance with SSPC-SP 1 to remove surface contamination.
4. In areas originally prepared by power tool cleaning, or if the substrate is not exposed in those areas previously blast cleaned, remove all loose material and prepare the surface in accordance with SSPC-SP 3. Use SSPC-SP 2 hand tool cleaning for surface preparation only upon written approval of the Department. Follow with solvent cleaning in accordance with SSPC-SP 1 to remove surface contamination.
5. In all areas where rigging or containment attachment points prevented complete surface preparation and coating application or exhibits damage, remove all loose material and prepare the steel in accordance with SSPC-SP 11. Follow with solvent cleaning in accordance with SSPC-SP 1 to remove surface contamination.

3.2.8.2 Surface Preparation of Extensive Areas

1. Repair extensive areas of damage, significant defects, or unacceptable coating only after submitting written repair procedures to the Department for approval and at no additional cost to the Department.

2. Prepare the surface by abrasive blast cleaning in accordance with SSPC-SP7, or better. The Department will stipulate the degree of blast cleaning required based on the nature of the defect.
3. Prevent damage to the surrounding coating due to overblast.

3.2.8.3 Feathering of Repair Areas

1. Feather the existing coating surrounding each repair location for a distance of 1 to 2 inches (25 to 50 mm) to provide a smooth, tapered transition into the surrounding existing intact coating, using a non-woven open-web abrasive disc.
2. Verify that the edges of coating around the periphery of the repair areas are tight and intact by probing with a putty knife in accordance with the requirements of SSPC-SP 3. Roughen the existing coating in the feathered area to assure proper adhesion of the repair coats.

3.2.8.4 Coating Application in Repair Areas

1. When the bare substrate is exposed in the repair area, apply all coats of the system to the specified thicknesses.
2. When the damage does not extend to the bare substrate, apply only the affected coats.
3. Maintain the thickness of the system in overlap areas within the specified total thickness tolerances.
4. Repairs to the finish coat shall result in an acceptable uniform gloss and color on visible members.

3.2.9 HOUSEKEEPING AND WASTE DISPOSAL

3.2.9.1 Conduct housekeeping daily to maintain the work site in a neat and orderly condition. Do not store any paint or equipment on or below the bridge structure.

3.2.9.2 Unless directed otherwise by the Department, at the end of each day at a minimum, haul empty paint cans and other debris to the waste storage area.

3.2.9.3 Remove all paint drips, splashes, and overspray from surfaces not intended to be painted or previously painted work.

3.2.9.4 Upon project completion, remove all equipment and materials, correct any damage caused by the operation, and leave all surfaces in a clean and acceptable condition, including the revegetation of ground areas defoliated by the work.

3.2.9.5 Handle, store, transport, and dispose of all hazardous and non-hazardous project waste in strict accordance with Federal and state regulations. Comply with Item 556.401 for all hazardous waste.

3.2.10 INSPECTION

3.2.10.1 Quality Control (QC).

1. The field painting contractor is required to conduct and document quality control inspection of the cleaning and painting operations in conformance with SSPC QP1 requirements SSPC QP1 forms.
2. The data shall be recorded in a log maintained at the site and available for the Department's review during working hours.

3.2.10.2 Quality Assurance (QA). The Department will perform QA inspection on all phases of the work to verify that it is in conformance to the requirements of this Item.

1. Facilitate QA inspection as required, including proper notification, allowing adequate time for the inspections, and providing lighting and access to the work together with all necessary safety and fall protection equipment.
2. QA inspections will include the following minimum hold points to determine specification compliance. Do not proceed with subsequent phases of the work until the preceding phase has been approved by the Department:
 - a) prior to the start of work,
 - b) immediately following surface preparation,
 - c) immediately prior to the application of the first coat,
 - d) prior to the application of each additional coat, and
 - e) after the final coat is applied and dried.
3. The presence or activity of Department QA inspections in no way relieves the Contractor of the responsibility to comply with all requirements of this Item, and to provide adequate inspections of its own to assure compliance with the requirements of this Item.
4. Furnish, until final acceptance of the coating system, all equipment and instrumentation needed to inspect all phases of the work.

3.2.11 THREE-YEAR ANNIVERSARY INSPECTION

3.2.11.1 A three-year anniversary inspection will be conducted after completion of the painting. Participate in this inspection with the Department.

3.2.11.2 Should the coating system fail within three years after the project has been accepted, the coating shall be repaired by the Contractor at no cost to the State. The extent and method of repair must be acceptable to the Department. System failure does not include damage from external agents, such as scraping from snow removal equipment, vandalism, debris impacts, collisions, etc., or normal loss of gloss and color. Once the coating system has been accepted, a failure shall mean any visible corrosion, blistering, checking, cracking, or delamination (peeling) of the paint resulting from the installation of the product or from the performance of the coating. Perform all repairs in accordance with the requirements of this Item and the coating manufacturer's written instructions.

204

3.3 CONTAINMENT & ENVIRONMENTAL PROTECTION (ITEM 556.201).

3.3.1 CONTAINMENT - GENERAL

3.3.1.1 Use a containment system that maintains the work area free of emissions of dust and debris in accordance with all provisions of this Item.

3.3.1.2 Follow the containment requirements as specified in this Item and as stipulated in SSPC Guide 6 for the selected method of removal. The requirements are summarized in Table 1 (attached).

3.3.1.3 Unless specifically approved by the Department, equipment and workers are not allowed to operate, or to be present, over any lanes that are open to traffic except from within engineered containment enclosures meeting minimum clearance requirements (see also Prosecution of Work).

3.3.1.4 The clearance of containment enclosures hanging from the bridge over the water above the navigable channel shall be approved by the U.S. Coast Guard (see stipulations in the Permit Section of the Proposal).

3.3.1.5 All monitoring shall be conducted under the observation of the Department for activities such as high volume monitoring (3.3.12.1(3)), soil sampling (3.3.10.1(2)), monitoring regulated areas (3.4.12.2), and final clearance (3.3.13.3(1)). Monitoring and sampling documentation shall be signed by the Department Representative.

3.3.2 CERTIFICATION OF CONTAINMENT INSTALLATION

3.3.2.1 After the containment system is installed, the designer of the system shall conduct a site inspection, in the presence of the Department representative, and issue a letter stating that the containment system has been assembled as shown on the drawings. Submit the letter to the Department before starting any work within the containment.

3.3.2.2 If the containment is not in accordance with the design drawings, issue supplemental calculations for the new design to the Department for documentation in accordance with the original submittal requirements.

3.3.3 CONTAINMENT ATTACHMENT POINTS

3.3.3.1 Do not weld, cut, drill, or otherwise alter the bridge members in order to attach or remove the containment. Drilling is not permitted in concrete bridge superstructure or substructure components.

3.3.3.2 Use approved softening materials to protect bridge members and newly coated steel from impact points. Use softeners in all areas where rigging, safety cables, attachments and containment system comes into contact with the steel.

3.3.3.3 Upon removal of rigging and attachment points, perform repairs as identified in Section 3.2.8.1.5.

3.3.4 CONTAINMENT FLOORING SYSTEM

3.3.4.1 If the floor or ground beneath the structure being prepared serves as the base of the containment, cover it with air and dust impenetrable materials such as solid panels of plywood or flexible

materials such as tarpaulins. Maintain the materials throughout the project to avoid losing debris through rips, tears, or breaks in the coverings.

3.3.4.2 If a suspended or elevated platform is constructed to serve as the base of the containment, use rigid and/or flexible materials, and cover as needed to create an air and dust impenetrable enclosure. Verify that the platform and its components are designed and constructed to support at least 4 times its maximum intended load without failure, with wire cables capable of supporting at least 6 times their intended load without failure. Strictly follow all applicable OSHA regulations regarding scaffolding.

3.3.4.3 Strictly follow all applicable OSHA regulations regarding the installation and daily inspection of scaffolding, platforms, and wire cables. Maintain a daily log of the results of the inspections made each shift, and after any occurrence which could affect the structural integrity of the scaffolding or wire ropes.

3.3.5 CONTAINMENT GROUND COVERS AND WATER BOOMS

3.3.5.1 When directed by the Department, provide ground covers around and beneath the containment area to capture inadvertent spills or leaks of debris. Extend the covers a minimum of 10 feet beyond the area covered by the containment. Remove debris from the covers at least once per shift, or as directed by the Department.

3.3.5.2 When working over or near water, provide the necessary material and equipment on site to contain inadvertent spills or releases of dust and debris into the water. Describe the methods that will be used to control spills in the Containment submittals.

1. Materials and equipment that are typically acceptable for control include water booms and boats with skimmers.
2. Remove all project-related dust and debris from the surface of the water at the end of each work day at a minimum.
3. Conduct more frequent cleaning if directed by the Department.

3.3.5.3 Comply with all U.S. Coast Guard notification and work restriction requirements. See U.S. Coast Guard stipulations in Permit Section.

3.3.6 PROTECTION OF DRAINAGE SYSTEMS AND UTILITIES

3.3.6.1 Protect storm sewers and drains from the entrance of debris from project activities. Keep all drain protection systems clean and operational throughout the entire project. At the end of each work day at a minimum, remove all visible debris from the drain protection systems, or from areas where rain water could carry the debris into drains or storm sewers. Conduct more frequent cleaning as directed by the Department.

3.3.6.2 Identify the methods that will be used to route run-off from the existing deck drains through the containment enclosure. Do not close any bridge deck drains.

3.3.6.3 Protect utility lines mounted on the bridge during all surface preparation and painting. Pay particular attention to removal of spent abrasive and paint from utility lines following surface preparation.

3.3.7 MAINTENANCE OF BRIDGE LIGHTING SYSTEMS AND CONTAINMENT LIGHTING REQUIREMENTS FOR THE WORK

3.3.7.1 Maintain all navigational lighting throughout the project. See U.S. Coast Guard stipulations in Permit Section.

3.3.7.2 Provide adequate lighting for all surface preparation, paint application, and inspection work in accordance with SSPC SP12. Maintain a minimum of 10 foot-candles for surface preparation and painting, and a minimum of 50 foot-candles of general area lighting for inspection. Increase the lighting if workers or inspectors have difficulty in seeing at no cost to the Department. Use explosion-proof lighting. Provide two hand held portable lights, capable of minimum of 200 foot candles illumination, and a light meter at the work site for use by the Department. The lights and light meter will remain the property of the Contractor.

3.3.8 CONTAINMENT COMPONENTS. The basic components that make up containment systems are defined below. The components are combined in Table 1 to establish the minimum containment system requirements for the method(s) of paint removal specified for the project.

3.3.8.1 Rigidity of Containment Materials: Rigid containment materials consist of solid panels of plywood, aluminum, rigid metal, plastic, fiberglass, composites, or similar materials. Flexible materials consist of screens, tarps, drapes, plastic sheeting, or similar materials. Use only fire resistant materials.

3.3.8.2 Permeability of Containment Materials: The containment materials are identified as air impenetrable if they are impervious to dust or wind such as provided by rigid panels, coated solid tarps, or plastic sheeting. Air penetrable materials are those that are formed or woven to allow airflow. Water impermeable materials are those that are capable of containing and controlling water when wet methods of preparation are used. Water permeable materials are those formed or woven with openings less than 25 mils in greatest dimension that are capable of collecting debris, while allowing water to pass through. Chemical resistant materials are those resistant to chemical and solvent stripping solutions.

3.3.8.3 Support Structure: Rigid support structures consist of scaffolding and framing to which the containment materials are affixed to minimize movement of the containment cocoon. Flexible support structures are comprised of cables, chains, or similar systems to which the containment materials are affixed. Minimal support structures involve nothing more than the cables or connections necessary to attach the material to the structure being prepared and/or to the ground.

3.3.8.4 Containment Joints: Containment joints include all interfaces between the containment, the structure and associated equipment. Fully sealed joints require that mating surfaces between the containment materials and the structure and floor, ceiling, or ground to be completely sealed. Sealing measures include tape, caulk, Velcro, clamps, or other similar material capable of forming a continuous, impenetrable or impermeable seal. Partially sealed joints involve the mating of the materials to one another and to the structure being prepared with concern for the structural soundness of the joint, but without consideration for creating a continuous, impenetrable or impermeable seal.

3.3.8.5 Entryway: An airlock entryway involves a minimum of one stage that is fully sealed to the containment and which is maintained under negative pressure using the ventilation system of the containment. Resealable door entryways involve the use of flexible or rigid doors capable of being repeatedly opened and resealed. Sealing methods include the use of zippers, Velcro, or similar fasteners. "C"-clamps and tarpaulins do not constitute a resealable door. Overlapping door tarpaulin entryways

consist of two or three overlapping door tarpaulins. Open seam entryways involve entrance into the containment through any open seam.

3.3.8.6 Mechanical Ventilation: The requirement for mechanical ventilation is to ensure that adequate air movement is achieved to reduce worker exposure to toxic metals to as low as feasible, and to enhance visibility. Design the system with proper exhaust ports or plenums, adequately sized ductwork, adequately sized dust collectors and properly sized and distributed make-up air points. At minimum, design the ventilation system to provide minimum airflow for operator visibility as described in SSPC Guide 6, Note 7.3. Natural ventilation does not require the use of mechanical equipment for moving dust and debris through the work area. It relies on natural airflow patterns, if any, through the containment.

3.3.8.7 Negative Pressure: If negative pressure is specified, verify its performance through instrument monitoring to achieve a minimum of 0.03 in. (0.75 mm) water column (W.C.) relative to ambient conditions, or through visual assessments for the concave appearance of the containment enclosure.

3.3.8.8 Exhaust Ventilation: When mechanical ventilation systems are used, provide filtration of the exhaust air, to prevent the discharge of airborne particulate from the containment. Utilize a filter that is at least 99.5% efficient in removing mono dispersed particles of 0.5 micrometers in diameter. Direct the discharge away from traffic, personnel, and containment or breathing air intakes. Record the pressure drop across the filter banks daily to verify proper operation of the equipment. Replace or clean the filter elements as directed by the equipment manufacturer in order to maintain proper air filtration.

3.3.8.9 HIGH WIND CONDITIONS AND INCLEMENT WEATHER

3.3.8.9.1 Monitoring Wind and Weather Conditions. Monitor wind speeds and weather conditions. Should sustained wind speed or gusts exceeding 40 mph, or heavy snow occurs (which may place an unacceptable load on the containment system), secure the containment and equipment.

3.3.9 VISIBLE EMISSIONS AND RELEASES TO AIR, SOIL, AND WATER

3.3.9.1 Visible Emissions Assessments

1. Conduct visible emissions assessments as defined in this Item, and in accordance with 40 CFR 60, Appendix A, Method 22. SSPC TU7, Conducting Ambient Air, Soil, and Water Sampling During Surface Preparation and Paint Disturbance Activities provides guidance on visible emissions assessments.
2. Conduct the visible emissions assessments to account for all locations where emissions of lead dust might be generated, including but not limited to, the containment, dust collection and abrasive recovery equipment, and waste containerizing areas.
3. In the event there are unique State or local regulations regarding visible emissions, those requirements are in addition to, but not in lieu of, the requirements of this Item.
4. Immediately shut down the project and undertake corrective action on each day that the emissions exceed this level. Limit random visible emissions from project activities to an SSPC Level 1 (no greater than 1% of the workday, or 5 minutes in an 8 hour workday) in accordance with SSPC Guide 6.

208

5. Conduct casual observations and corrections of visible emissions on an ongoing daily basis, but conduct the specialized assessments and inspections as described in this Item for a minimum of two, 15-minute intervals each shift. All visible emissions assessments shall be documented in writing in a daily log.
6. In the event of unacceptable emissions, do not resume the emission-producing operations until the cause of the release is corrected.
7. Even if the visible emissions results are acceptable, immediately shut down the work and initiate corrective action any time there are violations of high volume ambient air monitoring that may be undertaken by the Department.

3.3.9.2 Spills and Releases

1. Conduct all activities in such a manner as to prevent spills or releases of paint chips, abrasive, and other debris from contaminating the soil, water, sediment, or storm sewers.
2. Visually inspect the project site for releases of dust, paint chips, and debris outside of the work area that have become deposited on surrounding property, structures, equipment, or vehicles; on the unprotected ground, soil, water or sediment; around storm sewers or drains; or in areas where rain water could carry the debris into storm sewers or drains.
3. Clean up visible paint chips and debris on a daily basis at the end of each shift, or more frequently if directed by the Department. Conduct the cleaning by manually removing paint chips or by vacuuming. When vacuuming, use only HEPA vacuums.
4. When visible releases are observed, in addition to cleaning the debris, change work practices, modify the containment, or take other appropriate corrective action to prevent similar releases from occurring in the future.

3.3.9.3 Reporting of Visible Emissions and Releases

1. Report the results of the daily assessments in a log book or other report form.
2. Document all cases where work has been halted due to unacceptable visible emissions or releases, the cleanup activities invoked, and the corrective action taken to avoid a reoccurrence. Provide the written report to the Department within 48 hours of the occurrence.
3. Summarize the results of the assessments in a monthly report. Identify the frequency of observations made, the methods of observation utilized, the name of the observer(s), and results. Include and summarize the documentation prepared for work stoppages due to unacceptable visible emissions or releases.

3.3.10 SOIL SAMPLING AND ANALYSIS

3.3.10.1 General

209

1. Perform pre-job soil sampling within one week of project start-up to establish the pre-existing lead concentration in the soil. Perform post-job soil sampling within two weeks of completion of the work to establish the post-job lead concentration in the soil.
2. Submit a sampling plan to the Department prior to collecting samples. Collect all samples in the presence of a Department Representative. Analyze and submit pre-job sample results to the Department prior to the start of work. Analyze and submit post-job sample results to the Department within two weeks of taking samples.
3. Collect and analyze soil samples in accordance with the procedures as outlined in SSPC-TU7, Conducting Ambient Air, Soil, and Water Sampling During Surface Preparation and Paint Disturbance Activities. Carefully document and mark the location of soil samples at the site.
4. If the site experiences an increase in soil lead concentrations above the pre-existing lead concentration level as determined by comparison of pre-and post job samples as described in 3.3.10.4, notify the NHDES Site Remediation Division, 6 Hazen Drive, Concord, NH 03301 (Tel. 603-271-3744), and remediate the site to pre-existing lead concentration levels or lower.

3.3.10.2 Soil Sample Site Selection and Collection

1. Select locations for sampling within the likely dispersion zone of airborne dust or spills of debris and under and adjacent to the bridge, and in ancillary areas (e.g. the Contractor's storage and waste handling area) which may be contaminated during bridge painting operations with lead-bearing paint debris.
2. Verify that the number of sites is sufficient to properly characterize project conditions. Pay particular attention to wind direction, height of the structure, and the dust-producing nature of the operation when selecting the sites. Include samples around equipment, in debris containerizing areas, inside and around regulated areas, beneath and around the structure being prepared, and other locations of potential public or environmental exposure. Identify all proposed locations in the Environmental Protection Plan for approval.
3. Collect samples prior to the commencement of activities in a given area (e.g. collect samples in equipment staging areas prior to mobilization in those areas, and collect samples around the structure prior to the erection of the containment). Collect samples in the identical locations upon completion of all project activities. Collect all samples in the presence of the Department Representative.
4. Comply with the following minimum requirements for the collection of each sample.
 - a) Use tools and resealable containers for the collection and storage of the samples that are comprised of a material that will not contaminate the samples.
 - b) Place a one square foot template at each sample site. Remove plugs of ground (soil) measuring 3/4 inch (19 mm) diameter and 1/2 inch (13 mm) depth from the four corners of the template and from the center. Place the five plugs into a single sample container. This represents a single sample from the test site.

- c) Clean the sampling tool with deionized water and move the template three inches in any direction and collect a duplicate sample (5 plugs). Package the sample in a separate container.
- d) Accurately measure and document the specific location of each sample site in order for the precise locations to be re-sampled upon project completion.
- e) Identify each sample container with the following minimum information: date of collection, specific location of the sample, and name and signature of the person removing the sample. Complete a chain of custody record.
- f) Repeat the procedure at each sampling location, cleaning the sampling tool prior to each use.

3.3.10.3 Laboratory Analysis/Report

1. Have the samples analyzed for lead in accordance with EPA Method 3050 or approved equivalent method.
2. Have the Laboratory provide the results directly to the Department within 7 calendar days, with a copy provided to the Contractor.

3.3.10.4 Acceptance Criteria for Ground (Soil) Analysis

1. Visible paint chips or debris on the ground are not allowed and must be removed regardless of the laboratory test results (see 3.3.13.1).
2. The ground (soil) is considered to have been impacted by project activities based on increases over the geometric mean pre-job lead concentration.
 - a) If the geometric mean pre-job total lead concentration is less than 200 ppm, an impact is considered to have occurred if the post-job geometric mean lead concentration is an increase of 100 ppm or more.
 - b) If the pre-job concentration is greater than 200 ppm, an impact is considered to have occurred if the post-job geometric mean lead concentration exceeds the pre-job geometric mean plus 2 standard deviations, or an increase of 100 ppm occurs, whichever is greater.
3. Immediately notify the Department of all areas that are not in compliance. Unless directed otherwise by the Department, and at no cost to the Department, undertake the necessary cleanup to return the site to pre-project levels, and retest all remediated locations to verify that the cleanup is satisfactory.

3.3.11 REGULATED AREAS

3.3.11.1 Establish zones (regulated areas) around dust producing activities, supported by instrument monitoring, in accordance with 3.4.12.

3.3.12 HIGH VOLUME AMBIENT AIR MONITORING

3.3.12.1 General

1. Conduct high volume ambient air monitoring for lead as total suspended particulate (TSP). The Department reserves the right to require that the Contractor contract with a third party firm to perform air monitoring if necessary.
2. Conduct the monitoring as defined in this Item and applicable State or local regulations. The more stringent monitoring requirements take precedence in the event of a conflict.
3. Unless directed otherwise, conduct the following monitoring activities under the observation of the Department: siting and calibration of the monitors, daily removal and replacement of the filters, and completion of the chain of custody forms.
4. Include procedures in the Environmental Protection Plan for siting the monitors, calibrating and conducting baseline and project monitoring, and completion of chain of custody forms. Include the name and qualifications of the laboratory proposed for use, and the test methods that will be utilized for the analysis of the filters.

3.3.12.2 Number of Monitors and Siting

1. Unless otherwise directed by the Department, establish x locations (for a number see Section 556 Part I, otherwise use one) for monitoring around the bridge. Position the equipment in accordance with the requirements of State or local regulations and 40 CFR 58. Guidance for the number of monitors to use and monitor placement is also available in SSPC-TU7, Conducting Ambient Air, Soil, and Water Sampling During Surface Preparation and Paint Disturbance Activities.
2. Note that the purpose of the monitoring is for the protection of the public from the exposure of airborne lead and/or dust, and that the locations should be predominantly based in areas of potential public impact such as nearby residences, schools, playgrounds, hospitals, and other similar sensitive receptors. Identify the monitor placement locations in the Environmental Compliance Program for Department review and acceptance.

3.3.12.3 Operation of Equipment - High Volume Ambient Air Monitoring

1. Conduct the monitoring in strict accordance with the requirements of 40 CFR 50 and the equipment manufacturer's instructions.
2. Comply with all equipment calibration and operating procedures, including handling and transportation of filters, as described in the accepted Environmental Compliance Program.

3.3.12.4 Baseline Monitoring

1. Conduct pre-project monitoring for a minimum of two days while no paint removal work is underway in order to establish baseline levels. Unless directed otherwise, emissions from the project site will not be penalized by existing baseline levels.

2. If the baseline levels are highly variable, the Department may require that periodic or full time upwind monitoring be conducted. Include provisions for such monitoring in the Environmental Compliance Plan.

3.3.12.5 Laboratory Analysis and Report

1. Have all filters analyzed for lead using a laboratory that has been accepted by the Department.
2. Have the analysis conducted in accordance with 40 CFR 50.
3. Have the laboratory provide the results directly to the Department and copies to the Contractor. Provide verbal results of the analysis within 72 hours after the monitoring was performed, with a written summary report within seven days.
4. Include the following information in the written report - Name and location of the project; date of monitoring; time of monitoring (i.e. time monitoring begins and ends each day); monitor type, serial number, and location of monitoring units; wind direction and velocity; flow chart or other means used to verify the rate of air flow across the filter throughout the sampling period for each monitor; name and address of laboratory used; laboratory test procedure utilized; laboratory test results highlighting results that are out of compliance; names of field and laboratory personnel conducting the work; and chain-of-custody forms.

3.3.12.6 Acceptance Criteria for Emissions

1. TSP-lead - Comply with the acceptance criteria established in State or local regulations when available. If there are no State or local regulations governing TSP-lead, comply with the criteria established in 40 CFR 50.12; do not allow any emissions from project activities to exceed $1.5 \mu\text{g}/\text{m}^3$, averaged over a 90 day period.

For the purpose of this project, the 90 day average will be converted to a maximum amount for any given day using the following formula: $DA = (90 \div PD) \times 1.5 \mu\text{g}/\text{m}^3$, where DA is the daily allowance in $\mu\text{g}/\text{m}^3$ and PD is the number of preparation or paint disturbance days anticipated in a 90 day period.

2. In the event of any single exceedance of daily acceptance values, stop work immediately and make changes to the containment or work practices to bring emissions into compliance. Note that exceedances may also result in violations of State or local ordinances.

3.3.12.7 Duration of Project High Volume Ambient Air Monitoring

1. Unless directed otherwise, conduct the monitoring full time while paint removal, containment movement, and cleanup activities are underway. This will typically involve a minimum of 8 hours of monitoring per day. Monitoring during paint application is not required.
2. Unless otherwise directed by State or local regulations, full time monitoring may be waived, at the discretion of the Department, after a continuous period of monitoring within the acceptance criteria, in favor of periodic or random monitoring. Note that in the event that full time monitoring is discontinued, if unacceptable visible emissions occur, a minimum of

two days of monitoring shall immediately be undertaken. If exceedances are detected, continue the monitoring until a trend of acceptable results is achieved (a minimum of two consecutive days of monitoring within the acceptance criteria). The Department will determine when the additional monitoring can be discontinued.

3. The cost of all monitoring shall be paid by the Contractor. Discontinue monitoring only upon approval of the Department.
4. Document any corrective measures that are taken to correct exceedances.

3.3.13 FINAL CLEANING/CLEARANCE EVALUATIONS

3.3.13.1 General

1. Upon completion of project activities, and after all Contractor equipment and materials have been removed, conduct an inspection of the project site, and all surrounding property and surfaces located within the likely dispersion zone of project dust and debris.
2. Thoroughly inspect the property and surfaces for the presence of debris. Debris includes, but is not limited to, spent abrasives or other paint removal media, paint chips, materials of construction, fuel, and other litter. Remove all visible debris from the project site, even if the debris was a pre-existing condition.
3. Include procedures in the Environmental Protection Plan for project clean up, including the inspections that will be employed to verify that the cleanliness complies with the acceptance criteria identified in this Item.

3.3.13.2 Cleaning Requirements

1. Remove all project debris and litter from the project site and surrounding property, equipment, and structures.
2. When cleaning up paint chips and dust, use vacuuming equipment equipped with HEPA filters, wet washing, or other means that will effectively remove the dust and debris without re-dispersing it into the air. Do not use compressed air for cleanup activities unless it is used in conjunction with a ventilation system designed to capture the airborne particulate.
3. Collect water used for cleaning and dispose of in accordance Item 556.401.

3.3.13.3 Acceptance Criteria - Project Cleanup

1. After all clean up activities are completed, conduct a final inspection with the Department. Conduct any additional cleaning identified by the Department. Consider the site properly cleaned under the following conditions:
 - a) Paint chips, spent abrasive and other paint removal media, fuel, materials of construction, litter, or other project debris are not visible on or around the project site.
 - b) Lead dust has been removed from the surface of the completed structure as well as from surrounding structures and equipment.

214

- c) Comply with all soil criteria as specified earlier in this Item.

3.3.13.4 Report on Clearance Inspections

1. Prepare a letter report presenting the results of the inspections conducted to verify the final cleanliness of the project site, surrounding property, waterways, equipment, buildings, and structures.
2. Include a summary of any problems or releases that occurred during the project, and the clean up and corrective action measures that were taken to resolve the problem.

3.3.14 REPORTABLE RELEASES

3.3.14.1 Immediately notify the Department when there are spills of abrasives, paint, solvent, or paint debris.

3.3.15 CONTAINMENT SYSTEM DURING PAINT APPLICATION

3.3.15.1 Use a containment system during the application of all coatings to prevent paint droplets or overspray from escaping the work area. A containment system different than the one specified herein may be used for the application of coatings provided that overspray is fully contained, does not carry beyond the right-of-way, and a safe working environment is achieved. Alternative containments for coating application must be approved by the Engineer in advance.

3.4 WORKER PROTECTION (ITEM 556.301).

3.4.1 GENERAL

3.4.1.1 Conduct the work in strict accordance with Federal, state, and local regulations governing worker protection. All worker protection requirements apply to Contractor and Subcontractor personnel working for the Contractor who are exposed to lead and other toxic metals.

3.4.1.2 The requirements identified below are based primarily on the OSHA Lead in Construction Standard, 29 CFR 1926.62, but protect employees from exposure to any of the other toxic metals which may be present in the paint in addition to lead.

3.4.2 COMPLIANCE PROGRAM

3.4.2.1 Develop a written Compliance Program under the direction of a CIH, or approved alternate, to establish and implement practices and procedures for protecting the health of those employees exposed to lead and other toxic metals contained in the paint. This program is in addition to other OSHA hazard communication and safety and health requirements of the project. Revise and update the program at least every six months during the portion(s) of the project which involve the disturbance of toxic metals. Verify that the CIH, or approved alternate, signs off on all reviews and revisions.

3.4.2.2 Establish methods for complying with this Item and any OSHA standards published for the toxic metals present in the paint (e.g. 29 CFR 1926.62 for lead, 29 CFR 1926.1127 for cadmium, and 29 CFR 1926.1118 for inorganic arsenic). When toxic metals are present in the paint for which OSHA has not developed a comprehensive health and safety standard (e.g. chromium) include statements that the

workers will not be exposed above the permissible exposure level (PEL) established for the metal as identified in 29 CFR 1926.55.

3.4.2.3 Identify the methods of compliance that will be used to reduce worker exposures to toxic metals. Rely on respiratory protection only after feasible engineering and work practice controls have been first implemented to reduce airborne exposures.

3.4.2.4 Confirm that daily inspections of the work area will be made by a competent person. Identify the project competent person by name in the compliance program, his or her qualifications, and indicate the frequency of inspections that will be undertaken.

3.4.3 EXPOSURE MONITORING/INITIAL ASSESSMENT

3.4.3.1 Collect representative personal air samples at the beginning of the paint removal work (at project start-up) to determine employee exposures to lead and other toxic metals that might be present in the coating. Tasks resulting in the potential exposure to toxic metals include, but are not limited to, paint removal activities, cleanup, and debris handling operations. Collect full shift (at least 7 hours) air samples for workers in each job classification in each exposure area, including Department Representatives. Provide the Department with the results of the analysis within the same 5 day notification period required for the employees.

3.4.3.2 When lead is present, protect workers during the initial monitoring to the anticipated exposure levels as dictated by 29 CFR 1926.62 and as specified below. A few activities in addition to those dictated by OSHA are included. Use the same level of protection when other toxic metals are found in the coating, unless OSHA has developed a comprehensive health and safety standard for that metal (e.g. cadmium and inorganic arsenic). In those cases, implement the protection requirements of the standard for that metal.

1. Assume an exposure of at least $500 \mu\text{g}/\text{m}^3$: Manual demolition of structures containing lead-containing coatings or paint (e.g. dry wall), manual scraping, manual sanding, heat gun applications, power tool cleaning with dust collection systems, and spray painting with lead paint. Although not identified in 29 CFR 1926.62, include chemical stripping, water washing, and the operation of abrasive grit recovery equipment in this category.
2. Assume an exposure of at least $2,500 \mu\text{g}/\text{m}^3$: Using lead-containing mortar, lead burning, or conducting the following activities where lead-containing coatings or paint are present: rivet busting, power tool cleaning without dust collection systems, cleanup activities where dry expendable abrasives are used, and the movement and removal of abrasive blasting enclosures. Although not identified in 29 CFR 1926.62, include water jetting and wet abrasive blasting removal of paint in this category.
3. Assume an exposure of more than $2,500 \mu\text{g}/\text{m}^3$: Activities involving lead containing coatings or paint on structures disturbed by abrasive blasting, welding, cutting, and torch burning.
4. During any of the above activities, provide appropriate respiratory protection, personal protective clothing and equipment, change areas and washing facilities, blood lead and zinc protoporphyrin monitoring, and employee training. Maintain the protection as specified above until the test results are received, then modify the protection measures as necessary.

3.4.3.3 Collect and analyze all air samples according to the appropriate NIOSH method, or equivalent, for the metal of concern (e.g. Method 7082 for lead, Method 7048 for cadmium, Method 7300 for chromium, Method 7900 for inorganic arsenic). Only use laboratories which meet the qualification requirements established under 1.7 "Submittals," and which are approved by the Department.

3.4.3.4 Conduct exposure monitoring of Contractor workers and Department Representatives, and provide written employee notifications within five days of receipt of results in strict accordance with the applicable OSHA standard for the metal of concern (e.g. 29 CFR 1926.62 for lead). Conduct monitoring at project start up, and once each month thereafter. Note that monthly monitoring frequency is greater than required by OSHA. Conduct additional monitoring after any changes in work practices are made which could have an effect on airborne exposures. If there is no OSHA standard for the detected metal, conduct the monitoring and employee notification based on the requirements of OSHA 29 CFR 1926.62. Provide the Department with the results of any subsequent monitoring within the same 5 day notification period required for the employee.

3.4.4 ACTION LEVEL

3.4.4.1 The Action Level for lead is $30 \mu\text{g}/\text{m}^3$ as an eight (8) hour Time Weighted Average (TWA), the Action Level for cadmium is $2.5 \mu\text{g}/\text{m}^3$ as an 8 hour TWA, and the Action Level for inorganic arsenic is $5 \mu\text{g}/\text{m}^3$ as an 8 hour TWA. For other metals that are found in the coating, and for which no Action Level exists, establish the Action Level at 1/2 of the PEL.

3.4.4.2 Invoke the following protective measures when the airborne exposure to a toxic metal found in the coating exceeds the Action Level:

1. Exposure Monitoring
2. Housekeeping
3. Employee Medical Surveillance and Medical Removal Protection
4. Employee Information and Training
5. Signs and Regulated Areas
6. Recordkeeping

3.4.5 PERMISSIBLE EXPOSURE LIMIT (PEL)

3.4.5.1 The PEL for airborne lead exposure is $50 \mu\text{g}/\text{m}^3$ as an 8 hour TWA. The PEL for cadmium is $5 \mu\text{g}/\text{m}^3$ as an 8 hour TWA, and for inorganic arsenic is $10 \mu\text{g}/\text{m}^3$ as an 8 hour TWA. The PELs for other metals can be found in 29 CFR 1926.55.

3.4.5.2 In addition to complying with the requirements identified when exceeding the Action Level, invoke the following protective measures when the airborne exposure to a toxic metal found in the coating exceeds the PEL:

1. Compliance Program
2. Respiratory Protection
3. Protective Clothing and Equipment
4. Hygiene Facilities and Practices

3.4.6 RESPIRATORY PROTECTION

217

3.4.6.1 After feasible engineering controls and work practices have been implemented, use respiratory protection as necessary to maintain employees' exposures to lead and other toxic metals below the PEL. Require the use of respirators for all employees, inspectors, observers, or other personnel who enter areas where airborne exposures exceed or are expected to exceed the PEL, or when entering regulated areas.

3.4.6.2 Provide respiratory protection for up to two Department Representatives (see 1.7.4.1.1) at each site, including fit tests. The Department is responsible for verifying that the Representatives are medically fit to wear respirators.

3.4.6.3 Develop a written Respiratory Protection Program in compliance with 29 CFR 1926.103, including commitments to provide the necessary medical examinations. When lead is present, include the provisions of 29 CFR 1926.62. When cadmium is present, include 29 CFR 1926.1127. When inorganic arsenic is present, include 29 CFR 1926.1118. Address the selection, use, maintenance and inspection of respirators, and qualifications for respirator users.

3.4.6.4 Treat used respirator cartridges as hazardous waste and dispose of in accordance with Item 556.401.

3.4.6.5 Provide Grade D breathing air for all personnel using supplied air respirators. Grade D breathing air is described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989.

3.4.7 PROTECTIVE CLOTHING AND EQUIPMENT

3.4.7.1 Provide protective clothing and equipment and ensure they are worn by all employees whose exposures exceed the PEL. Provide all required protective clothing and equipment for use by up to two Department Representatives at each site.

3.4.7.2 Do not allow workers to wear street clothing beneath protective clothing in any areas where exposures to toxic metals exceed the PEL.

3.4.7.3 Clean or replace the protective clothing as required by the appropriate OSHA standard for the toxic metal that is present. In the case of lead, clean or replace the clothing weekly if the airborne exposure levels are less than $200 \mu\text{g}/\text{m}^3$ as an 8 hour TWA, or daily if the exposure levels are greater than or equal to $200 \mu\text{g}/\text{m}^3$. In the case of inorganic arsenic, the threshold for daily versus weekly cleaning is $100 \mu\text{g}/\text{m}^3$. Do not use disposable clothing for any longer than one day.

3.4.7.4 Do not remove or clean the clothing by any means which reintroduces the toxic metals into the ambient air such as brushing, shaking, or blowing. Use vacuums equipped with HEPA (High Efficiency Particulate Air) filters for cleaning.

3.4.7.5 Store the used clothing in sealed containers.

1. If the clothing is to be laundered and it has been exposed to lead, label the containers with the following: "CAUTION: CLOTHING CONTAMINATED WITH LEAD. DO NOT REMOVE DUST BY BLOWING OR SHAKING. DISPOSE OF LEAD CONTAMINATED WASH WATER IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, OR FEDERAL REGULATIONS." If the clothing has been exposed to cadmium, chromium, inorganic arsenic, or other metals, modify the above text accordingly.

2. If the clothing is disposable, label the containers as clothing contaminated with lead and other toxic metals, if applicable. Apply hazardous waste labels as appropriate after testing.

3.4.7.6 If the clothing is washed on site, provide containers for the collection and retention of the water after filtration. Provide ample filtration (e.g. through a multi-stage filtration system ending in 5 microns or better if needed) until the water can be disposed of as non-hazardous. Conduct all required tests of the water, and comply with Item 556.401 for its disposal.

3.4.8 HOUSEKEEPING

3.4.8.1 Clean accumulations of dust or debris containing lead or other toxic metals daily, at a minimum. Clean more frequently if visible accumulations are observed that could be carried outside of the regulated area by wind, workers shoes, rain water, or other means.

3.4.8.2 Conduct all cleaning with HEPA-filtered vacuums. Do not use compressed air for housekeeping purposes unless it is used in conjunction with a ventilation system capable of capturing the resulting airborne particulate.

3.4.8.3 Containerize the debris for proper disposal in accordance with Item 556.401.

3.4.9 PERSONAL HYGIENE FACILITIES AND EQUIPMENT

3.4.9.1 Provide clean lavatory and hand washing facilities in accordance with OSHA sanitation standard 29 CFR 1926.51. Locate the hand washing facilities in close proximity to the paint removal operation, in an area that is convenient for washing prior to eating or smoking. Provide showers when exposures exceed the PEL. Confirm that all employees whose exposures exceed the PEL shower prior to leaving the project site. Allow the Department's Representatives to use the lavatory and hand washing/shower facilities.

3.4.9.2 Filter and containerize all hygiene water. Provide ample filtration (e.g. through a multi-stage filtration system ending in 5 microns or better if needed) until the water can be disposed of as non-hazardous. Conduct all required tests of the water, and comply with Item 556.401 for its disposal.

3.4.9.3 Prohibit eating, drinking, smoking, chewing of food or tobacco products, or the application of cosmetics in any area where the exposure to toxic metals exceeds the PELs or within regulated areas, and confirm that workers thoroughly wash hands and face prior to undertaking any of these activities.

3.4.9.4 Provide clean lunch and break areas for use by all employees, and maintain airborne concentrations in these areas below the Action Levels.

3.4.9.5 Provide clean change area(s) for employees whose exposures exceed the PELs. Equip the change area(s) with separate storage facilities for street clothing that are adequately segregated to prevent cross-contamination from work clothing. Assure that employees do not leave the project site wearing any clothing that was worn while performing activities where exposures exceeded the PELs.

3.4.10 MEDICAL SURVEILLANCE AND MEDICAL REMOVAL PROTECTION

3.4.10.1 Provide all employees with initial and periodic blood lead and zinc protoporphyrin (ZPP) sampling and analysis, and medical surveillance as required by the published OSHA health and safety

standards for the metal of concern such as 1926.62 for lead and 1926.1127 for cadmium. Verify that the blood analysis is conducted by laboratories which meet the qualification requirements established under "Submittals," and which are approved by the Department. Provide the specialized medical surveillance and X-rays required by 1926.1118 for employees exposed to inorganic arsenic.

3.4.10.2 In the case of lead, the frequency of testing presented in 29 CFR 1926.62 is modified as follows: conduct blood sampling and analysis prior to project start up (within 2 weeks prior to paint disturbance activities), and at a minimum of once every two months thereafter throughout the project. Increase the test frequencies as required by 29 CFR 1926.62, such as in the case of medical removal. Conduct exit blood tests for each worker upon completion of his/her project activities which involve exposure to lead, even if this occurs prior to the completion of the Contractor's work on the project.

3.4.10.3 Do not use workers with initial blood lead tests of 30 µg/dl for any work activities involving exposure to lead above the Action Level. Note that this is more stringent than the provisions of 29 CFR 1926.62.

3.4.10.4 Provide for the temporary removal of employees from exposures above the Action Level for the metal of concern when the blood analysis indicates that unacceptable results are occurring. In the case of blood lead, this is 40 µg/dl or above. Note that this is more stringent than the provisions of 29 CFR 1926.62. In the case of ZPP, a level of 80 µg/dl or above is considered to be elevated, requiring temporary removal. Protect employees' benefits during any period of medical removal and conduct all tests required by the OSHA standard for the metal of concern during the removal period. In the case of lead, return workers to exposures above the PEL only after two consecutive blood tests are below 30 µg/dl for lead, or are below 80 µg/dl for ZPP, or as otherwise directed by the attending physician.

3.4.10.5 Provide all physical examinations as required by the appropriate OSHA standards for the metal(s) of concern, and verify that all examinations are performed by or under the direct supervision of a licensed physician.

3.4.10.6 Provide all exam information and test results to the employees in writing within 5 days of receipt.

3.4.10.7 Provide the Department with a letter report signed by the CIH, or approved alternative, which summarizes all pre, ongoing, and post project examination results together with the work activities performed by the individuals.

3.4.11 EMPLOYEE TRAINING AND INFORMATION

3.4.11.1 Provide initial and annual refresher training for all employees who will be exposed to toxic metals above the respective Action Levels on any one day in a 12-month period. Include all of the elements of training that are required by the appropriate OSHA standard. If a standard for the metal does not exist, use the training requirements outlined in paragraph (l) of 29 CFR 1926.62 as the basis of the training program highlighting the differences as appropriate for the other metals of concern. Maintain written verification of employee training at the job site.

3.4.11.2 In addition to the training of Contractor personnel, provide the necessary training for up to two Department Representatives at each site.

3.4.11.3 When other contractors or employers are present at the site, notify them of the nature of the lead exposure work, the need to remain out of exposure areas, the warning signs and labeling system in

effect, and the potential need for them to take measures to protect their employees in accordance with the applicable OSHA regulations.

3.4.12 SIGNS AND REGULATED AREAS

3.4.12.1 Physical Demarcation of Regulated Areas

1. Establish zones (regulated areas) around dust producing activities, supported by instrument monitoring, to assure that harmful airborne emissions of lead, cadmium, chromium, inorganic arsenic, or other toxic metal are not being generated. in excess of the Action Level (e.g. paint removal and clean-up locations, dust collector staging areas, waste storage areas, etc.). Unless otherwise directed by the Department, until the monitoring results are available to establish the perimeter of the regulated area, initially establish the boundary a minimum of 15 feet away from any equipment or operations that might generate airborne emissions of toxic metals.
2. Use ropes, ribbons, tape, or other visible means to define the regulated areas, and control entrance into these areas. Verify that all workers who enter regulated areas have had the proper training, blood analysis and medical examinations, and are wearing the required protective clothing and equipment. Prohibit eating, drinking, smoking, and chewing of food or tobacco products in any area where the exposures exceed the Action Level.
3. Post caution signs around the regulated areas. If there is no regulation for the metal of concern, use the legend for the CAUTION sign as found in 29 CFR 1926.62 as the basis, and insert the name(s) of the other toxic metals. Sign requirements for lead, cadmium, and inorganic arsenic are as follows:

WARNING
LEAD WORK AREA
POISON
NO EATING OR SMOKING

DANGER, CADMIUM
CANCER HAZARD,
CAN CAUSE LUNG AND KIDNEY DISEASE,
AUTHORIZED PERSONNEL ONLY,
RESPIRATORS REQUIRED IN THIS AREA

DANGER
INORGANIC ARSENIC
CANCER HAZARD
AUTHORIZED PERSONNEL ONLY
NO SMOKING OR EATING
RESPIRATOR REQUIRED

3.4.12.2 Instrument Monitoring to Establish and Maintain Regulated Areas

1. Unless directed otherwise by the Department, use a minimum of four personal or high flow area sampling pumps around the paint removal operation at the boundary of the regulated area when abrasive blast cleaning is employed, and a minimum of two (2) pumps for the

monitoring of all other activities which might generate emissions (e.g. for methods of removal other than abrasive blast cleaning, dust collection/ventilation equipment staging areas, etc.).

2. Identify the proposed locations for the sampling in the Worker Protection Compliance Plan. Select locations that will properly assess potential emissions, with particular attention to locations of public access or exposure.
3. Unless directed otherwise by the Department, conduct the monitoring initially at the start of paint removal operations at each containment and equipment staging location, and for one day every other calendar week thereafter. If unacceptable results are found, conduct continuous monitoring until the problem is proven to be corrected. Return to bi-weekly monitoring only upon approval of the Department.
4. Conduct the monitoring according to NIOSH Method 7082, or equivalent method for the other metals of concern, at the boundaries of the regulated area(s). Collect the samples throughout an entire work shift upon commencement of the paint removal activities (at project-start-up).
5. If the monitoring confirms that project emissions do not exceed the Action Level as an 8 hour TWA, establish or maintain the boundary at that location.
6. If the monitoring shows that the emissions exceed the Action Level, modify and improve work practices and containment to provide better controls over the emissions, or reestablish the boundary at a different location if allowed by the Department. Repeat the monitoring in either case.

3.4.12.3 Verify that the exposure cassettes are only analyzed by laboratories which meet the qualification requirements established under "Submittals," and which are approved by the Department. The laboratory must provide the results to the Contractor within 72 hours of the field sampling. Provide the test results to the Department verbally within one day of receipt, and in writing within one week thereafter.

3.4.13 RECORDKEEPING

3.4.13.1 Retain all records related to training, medical examinations, blood analysis, exposure monitoring, respirator fit testing, inspections by a competent person, and other related project documentation on file at the project site.

3.4.13.2 Provide the Department with letter reports signed by a CIH, or approved alternate, which summarize all examination results that are indicative of worker exposures to (or which demonstrate proper protection from) toxic metals. In the case of lead, summarize the blood lead and ZPP results, indicate any observed trends, and identify worker removal provisions that were invoked based on the results. Provide summary reports of the test results prior to worker exposures to project activities, periodic surveillance results, and results upon completion of site exposures. Provide the Department with an original signed copy of each report within 10 calendar days after issuing the test results to the employees.

3.4.13.3 Retain all records for the duration of employment plus 30 years.

222

3.5 WASTE MANAGEMENT (ITEM 556.401).

3.5.1 GENERAL

3.5.1.1. The NHDES Waste Management Division must be notified (603-271-2921) and an EPA ID number obtained before conducting any hazardous waste activities. The Contractor is responsible for obtaining the EPA ID number unless the Department has already done so (see Part I).

3.5.1.2 The NHDOT and the Contractor are co-generators of the hazardous waste. For projects generating more than 100 kg/month (220 lb./month), the classification is "Full/Large Quantity Generator."

3.5.1.3 Assume the responsibility for the proper collection, handling, storage, transportation, and disposal of all wastes on behalf of the Department.

3.5.1.4 Recover all waste products generated during cleaning and painting work, including but not limited to rags, tape, disposable coveralls, respirator and dust collector filters, spent solvents, paint debris, and paint cans.

3.5.2 RESPONSIBILITIES OF THE CONTRACTOR

3.5.2.1 Containerize, test (classify), handle, and store all waste, including lead-bearing wastes, paint wastes, and spent solvents.

3.5.2.2 Contract with licensed and/or permitted waste transporters for the transportation of all hazardous waste, non-hazardous waste, and waste water. Select the hazardous waste transporter from the lists available from the NHDES Waste Management Division (Tel. 603-271-2048).

3.5.2.3 Contract with licensed and/or permitted recyclers or disposers of all waste.

3.5.2.4 Provide locations for waste storage and institute appropriate measures to assure that the area is secure.

3.5.2.5 Complete the hazardous waste manifests in accordance with 40 CFR 262, NHDES regulations, and provide the original to the Department's Representative for signing.

3.5.2.6 Provide Certificates of Disposal for all hazardous waste.

3.5.2.7 Provide Bills of Lading for all non-hazardous waste.

3.5.3 WASTE SAMPLING, TESTING, AND CLASSIFICATION

3.5.3.1 Sampling

1. Collect representative samples of the paint debris generated by project activities. Collect all samples under the observation of the Department Representative.
2. Collect samples in accordance with SW-846, "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods." Describe the sampling methods in the Waste Handling Plan.

3. Handle and treat paint waste generated through the use of metal abrasives as hazardous, but collect and have analyzed, a minimum of one representative sample of the metal grit/paint debris to identify the composition of the waste.
4. Collect and have analyzed, a minimum of four representative samples of all other waste streams (i.e. waste streams which do not contain metal abrasives). Use a random sampling technique to collect the samples.
5. Complete the initial sampling of each waste stream immediately upon filling the first container, but do not allow waste to accumulate for longer than 30 days before sampling, or as otherwise directed by the Department. After the representative samples are collected, send them immediately to the laboratory for analysis.
6. Unless directed otherwise by the Department, or required by state regulations or the waste recycling or disposal facility, once each waste stream is sampled, tested, and classified, additional sampling and analysis are not required for subsequent shipments unless the waste stream changes.

3.5.3.2 Testing

1. Only use laboratories which meet the qualification requirements established under "Submittals," and which are approved by the Department.
2. Direct the laboratory to test the waste in accordance with 40 CFR 261, Appendix II, Method 1311, Toxicity Characteristic Leaching Procedure (TCLP), to determine if it is hazardous.
3. Analyze the sample of metal grit/paint debris and the first two samples from each of the other waste stream by TCLP for all eight (8) metals and other hazardous substances. Analyze subsequent samples of the waste stream(s) other than metal grit for any metal or hazardous material that is detected in the initial TCLP testing. When chemical strippers are used, test all liquids and sludge. Include pH to determine corrosivity.

3.5.3.3 Classification

1. Paint debris is classified as hazardous waste if the leachate contains any of the 8 metals or other hazardous substances in concentrations at or above limits established in 40 CFR 261.

Arsenic -	5.0 mg/L	Lead -	5.0 mg/L
Barium -	100.0 mg/L	Mercury -	0.2 mg/L
Cadmium -	1.0 mg/L	Selenium -	1.0 mg/L
Chromium -	5.0 mg/L	Silver -	5.0 mg/L

Note that paint debris that is generated through the use of metal abrasives has been classified by the NHDOT as hazardous for lead even though it may pass the TCLP test.

2. The above list includes only those elements typically associated with paints. Take into account other substances that may be present which can cause debris to be classified as hazardous waste as defined in 40 CFR 261 (e.g. pH ≤ 2.0 or ≥ 12.5 resulting in corrosivity, or the characteristic of ignitability).

224

3. Solvent and paint wastes are classified as hazardous if they are listed, characteristic, or ignitable. Identify procedures used to classify solvent and paint wastes.

3.5.3.4 Laboratory Report

1. Have the laboratory send the original test report directly to the Department with copies of the test results to the Contractor. Issue the reports no later than ten (10) calendar days after the representative samples are collected.
2. Include the following minimum information in each report: Identity of the waste stream(s) analyzed, the number of samples collected and tested, dates of sampling and testing, laboratory test procedures utilized, the names and signatures of the individuals collecting the samples and conducting the laboratory tests, and an interpretation of the test results. Include copies of the chain-of-custody forms in the documentation.
3. For wastes not tested but classified as hazardous (e.g. spent solvent), provide summary of quantity, type and disposal facility.

3.5.4 WASTE HANDLING, PACKAGING, AND STORAGE

3.5.4.1 Comply with 40 CFR 262, NHDES regulations for the on-site handling, packaging, and storage of all waste generated by the project.

3.5.4.2 Place hazardous waste containers on an impervious surface (e.g. concrete, asphalt, impervious tarpaulin ground cover). Locate in a secure area with signs around the perimeter, with a locked gate, and shield adequately to prevent dispersion of the waste by wind or water. Do not store containers within 50 feet of surface waters. Select the location of the secured waste storage area together with the Department.

3.5.4.3 At a minimum, collect and store the waste at the end of each working day in storage drums or containers such that no waste is left exposed overnight. Use US DOT-approved containers for waste storage. Unless otherwise agreed upon by the DES, transport the waste to the secured storage area at the end of each day.

3.5.4.4 Cover all containers immediately upon filling and confirm that all lids are attached except when filling. Containers shall be covered to keep moisture from collecting on the container lid. Verify that all labels remain intact.

3.5.4.5 Store non-hazardous waste separately from hazardous waste. Do not co-mix hazardous waste with non-hazardous waste. Do not mix different types of hazardous waste together unless specifically approved by the Department and the disposal facility.

3.5.4.6 Arrange containers in the storage area for easy accessibility. Stage the containers together in lots no greater than two rows of five containers each. Maintain a minimum aisle clearance of 24 inches between each rows of containers to allow for the inspection of at least one side of each container.

3.5.4.7 Verify that all waste is transported to the appropriate recycling or disposal facility within 60 days after waste is first placed into the container.

225

3.5.4.8 Improper waste storage is cause for immediate project shut down until appropriate corrective action is completed.

3.5.4.9 Train all personnel in the proper handling of the hazardous waste at the work site in accordance with 40 CFR 265.16. Include procedures in the Waste Handling Plan that will be followed in the event of a release or spill, required notifications, and methods to be used for cleanup. Maintain all training records on-site.

3.5.4.10 Do not fill any container or roll-off in excess of the capacity marked on the container. If delays during pick-up are caused by overfilled containers, remediate the situation at no additional cost to the NHDOT.

3.5.4.11 If soil remediation is required as a result of Contractor activities, place the soil into separate containers, and assume all costs for its disposal.

3.5.4.12 Do not store ignitable wastes or flammable or ignitable materials within 20 feet of the drip line of the bridge.

3.5.5 LABELING OF CONTAINERS

3.5.5.1 Immediately label all containers of project waste and debris to identify the contents. For example, label containers of spent abrasive as "BRIDGE BLAST ABRASIVE WASTE, Contains Lead". Include the Contract Number and the Bridge Identification Number. Provide similar labels on containers of other project waste and debris.

3.5.5.2 After the TCLP test results are received indicating the waste tests hazardous or if a waste is classified as hazardous without testing (e.g. metal abrasive, spent solvents, etc.), immediately apply hazardous waste labels. Label each container or rolloff of hazardous waste in accordance with 40 CFR 262, and 49 CFR 171-179. Include the following minimum information:

1. Hazardous Waste. Federal law prohibits improper disposal. If found, contact the nearest police, or public safety authority, or the U.S. Environmental Protection Agency.
2. Proper US DOT Shipping Name
3. Manifest Document Number
4. Generator Name, Address, and EPA ID No
5. Date of Accumulation
6. EPA Waste Number

3.5.5.3 Enter the above information using permanent marking material, printed in English, and displayed on a background of contrasting color unobscured by other labels or attachments. Locate labeling away from other markings that could substantially reduce its effectiveness.

3.5.5.4 Complete the labeling, marking, and placarding activities under the observation of the Department, prior to storing or transporting any container or rolloff.

3.5.6 WASTE TRANSPORTATION AND DISPOSAL

3.5.6.1 Hazardous Waste

1. Prepare the uniform hazardous waste manifest (EPA Form 8700) for each shipment and provide to the Department for review and signature. The uniform hazardous waste manifest has six (6) copies. Following signature by the Department and the transporter, retain manifest copy #6.
2. Provide one (1) copy of manifest copy #6 to the Department Representative. Submit another photocopy of copy #6 to NH Dept. of Environmental Services, Waste Management Division-RIMS PO Box 3900, Concord NH 03302-3900, within 5 days of shipment.
3. Most states of destination (i.e. the state in which the waste is be disposed of), also require a copy of the uniform hazardous waste manifest.
4. Arrange for the transportation of all hazardous waste by a licensed transporter in accordance with 40 CFR 263, 49 CFR 171-179, NHDES regulations, and applicable City regulations. Verify that all waste is completely covered during transport. Provide the name, address, and qualifications of the licensed waste transporter to the Department for acceptance.
5. Arrange for the recycling or disposal of all hazardous waste in accordance with 40 CFR 264, 40 CFR 268, NHDES regulations. Verify that only licensed recycling or TSD facilities are used. Provide the name, address, qualifications, and letter of commitment from the recycling or TSD facility to the Department for acceptance.
6. Comply with all of the manifesting, certification, and reporting requirements for hazardous waste in accordance with 40 CFR 262, 40 CFR 268, NHDES regulations, including certificates of final disposal for each shipment.
7. Provide a certification for each manifested shipment that the waste was accepted by the recycling or disposal facility, and properly treated and disposed.

3.5.6.2 Hazardous Waste Transport [blank]

3.5.6.3 Non-Hazardous Municipal/Construction Waste

1. Properly transport, and dispose of all non-hazardous municipal construction waste.
2. Verify that waste is completely covered during transport.
3. Comply with additional City regulations as applicable.

3.5.7 SPECIAL WASTE REQUIREMENTS FOR RECYCLED STEEL GRIT

3.5.7.1 Comply with the requirements for the site collection, handling, storage, and transportation of the waste as if it tested hazardous.

3.5.8 WASTE WATER HANDLING AND DISPOSAL

227

3.5.8.1 Provide containers for the collection and retention of all waste water, including but not limited to the water used for hygiene purposes, laundering of clothing if done on site, and cleanup activities.

3.5.8.2 Filter visible paint chips and particulate from the water prior to placing it into the containers. Prior to disposal, test the water for total toxic metals and provide ample filtration (e.g. through a multi-stage filtration system ending in 5 microns or better if needed) until the water is not classified as hazardous.

3.5.8.3 Make disposal arrangements with the local publicly owned treatment works (POTW), sanitation company, or other appropriate permitted facility. Provide the Department with documentation signed by an official of the facility stating that the facility will accept the waste, and that the levels of any lead remaining in the water are acceptable.

3.5.8.4 Provide the Department with the name and address of the transporter and disposal facility for acceptance prior to use.

3.5.9 HAZARDOUS WASTE GENERATION FEES

3.5.9.1 Pay all of the required fees to the State of New Hampshire for the volume of hazardous waste generated (NHDES Bureau of Waste Management, Tel. 603-271-5186). The fees are based on the weight of the waste and must be remitted per calendar quarter. Issue the payment to the "Treasurer, State of New Hampshire" and provide the NHDOT with proof of the quarterly payments.

3.5.10 RECORDKEEPING

3.5.10.1 Provide the following information to the Department: all manifests and certificates of disposal, a listing of the type and quantity of all waste generated and disposed, and the names of the transportation and disposal facilities used for all waste.

METHOD OF MEASUREMENT

4.1 Item 556.101, Painting Existing Structural Steel, will be measured as a unit. All labor, tools, equipment, surface preparation, paints, caulking, paint application, materials, scaffolding, supplies, plans, programs, services of the manufacturer's representative, or incidentals to properly perform and complete the Work specified, will be a unit.

4.2 Item 556.201, Containment & Environmental Protection, will be measured as a unit. All labor, tools, equipment, materials, scaffolding, supplies, plans, programs, monitoring equipment, laboratory services, and incidentals to properly perform and complete the Work as specified, will be a unit.

4.3 Item 556.301, Worker Protection, will be measured as a unit. Payment for all worker protection requirements is based on lump sum. Full compensation for protection of all Contractor personnel, including protective clothing and equipment, medical surveillance, hygiene facilities, laundering, establishment and maintenance of regulated areas, and documentation, protective clothing and equipment for two Department Representatives at each site for each shift, as well as lead training in accordance with 29 CFR 1926.62, will be a unit.

4.4 Item 556.401, **Waste Management**, will be measured as a unit. All labor, materials, tools, equipment, supplies, sampling, testing, storing, transporting, treating and disposing of all waste (hazardous, non-hazardous, waste water), and fees necessary or incidental to properly perform and complete the work specified, will be a unit.

BASIS OF PAYMENT

5.1 The accepted quantity of Item 556.101, **Painting Existing Structural Steel**, will be paid for at the contract lump sum price, complete in place. Partial payments will be made. The contract lump sum price will be prorated to establish the amount of each partial payment based on the percentage of the item that has been completed.

5.2 The accepted quantity of Item 556.201, **Containment & Environmental Protection**, will be paid for at the contract lump sum price, complete. Partial payments will be made. The contract lump sum price will be prorated to establish the amount of each partial payment based on the percentage of the item that has been completed.

5.3 The accepted quantity of Item 556.301, **Worker Protection**, will be paid for at the contract lump sum price, complete. Partial payments will be made. The contract lump sum price will be prorated to establish the amount of each partial payment based on the percentage of the item that has been completed.

5.4 The accepted quantity of Item 556.401, **Waste Management**, will be paid for at the contract lump sum price, complete. Partial payments will be made. The contract lump sum price will be prorated to establish the amount of each partial payment based on the percentage of the item that has been completed.

5.4.1 Payment will be made only after the Department receives all properly executed waste disposal documentation, including certificates of disposal, bills of lading, etc. If there are discrepancies in quantities or in any of the documentation requirements, payment will be withheld until the discrepancies are resolved.

5.4.2 If the Department is fined or penalized, in addition to other remedies the Department may possess as a result of the Contractor's performance or lack thereof on this work item, said fine or penalty will be deducted from the Contractor's payments on the appropriate bid items of work.

PAY ITEM AND UNIT:

556.101	Painting Existing Structural Steel	Unit
556.201	Containment & Environmental Protection	Unit
556.301	Worker Protection	Unit
556.401	Waste Management	Unit

229

PART III of III -- SECTION 708 PAINTS**SECTION 708 - PAINT SYSTEM B
Organic zinc rich / Epoxy / Urethane****NH 1.20 Organic Zinc-Rich (Epoxy or Urethane) Primer**

1. General. This VOC-compliant organic zinc-rich primer is to be used on structural steel cleaned to SP10 and meeting the requirements of NEPCOAT. Water-base systems are not permitted.

(NEPCOAT refers to the qualified products list of coatings approved by the Northeast Protective Coatings Committee and meeting the requirements of the NEPCOAT Specification Criteria for Protective Coatings for Use on New and Bare Existing Steel).

NH 3.21 High-Build Epoxy Polyamide Intermediate

1. General. This specification covers a VOC-compliant epoxy polyamide and is suitable for use on steel surfaces which have been properly cleaned and primed.

2. Composition.

Mixed Epoxy-Polyamide (All parts mixed)

VOC content, 2.8 max. Lb./Gal. (340 g/L)

3. Color.

The color when dry shall Contrast with primer & topcoat

NH 3.81 Aliphatic Polyurethane Finish

1. General. This specification covers a VOC-compliant, polyurethane having good color retention and weathering resistance and suitable for use over an intermediate coat.

2. Composition.

Mixed Aliphatic Polyurethane Enamel (All parts mixed)

VOC content, 2.8 max. Lb./Gal. (340 g/L)

3. Color.

Color: See 2.2 (9)

Finish: Semi-gloss

230

**SECTION 708 - TABLE B
PAINT SYSTEM B - Organic zinc rich / Epoxy / Urethane**

The following list of paint systems are approved for the painting of structural steel cleaned to SP10. These coatings have been tested and approved by NEPCOAT.

1. PPG Protective & Marine Coatings (www.ppgamercoatus.ppgpmc.com)
 One PPG Place, Pittsburgh, PA 15272 (412) 434-3131
 Local contact: C. G. Edwards & Co. (617) 268-4111

 Primer: Amercoat 68 HS Zinc Rich Epoxy Primer
 Intermediate: Amercoat 399 Fast Drying Epoxy
 Finish: Amercoat 450H Gloss Aliphatic Polyurethane

2. Carboline Company (www.carboline.com)
 350 Hanley Industrial Court, St. Louis, MO 63144-1599 (800) 848-4645
 Local contact: Charles Vaillant (603) 329-9691

 Primer: Carboline 859 Organic Zinc Rich primer
 Intermediate: Carboline 893 Epoxy intermediate
 Finish: Carboline 133 LH Aliphatic Polyurethane

3. International Protective Coatings (www.international-pc.com)
 6001 Antoine, Houston, Texas, 77091, Dan Griffin (800) 525-6824 x 1289
 Local contact: Mark Ellis (508) 587-8877

 Primer: Interzinc 52 Organic Zinc Primer
 Intermediate: Intergard 475 HS Epoxy
 Finish: Interthane 979 Polysiloxane

4. MAB Paints (www.mabpaints.com)
 600 Reed Rd, Broomall, PA 19008 (800) MAB-1899

 Primer: Ply-Tile Epoxy Organic Zinc Rich Primer
 Intermediate: Ply-Mastic 650 HB Epoxy Coating
 Finish: Ply-Thane 890 HS Aliphatic Acrylic Urethane

5. PPG High Performance Coatings (www.ppg.com)
 One PPG Place, Pittsburgh, PA 02572, George DuPont (401) 946-7496
 Local contact:

 Primer: Aquapon® 97-670 Zinc Rich Primer ABC
 Intermediate: Pitt-Guard® 97-946 All Weather Direct To Rust Epoxy
 Finish: Pitthane® 95-8800 HB Urethane Enamel

6. Sherwin Williams Company (www.sherwin-williams.com)
101 Prospect Ave, N.W. Cleveland, OH 44115 (216) 566-2000

Primer: Zinc Clad III HS Organic Zinc Rich Epoxy Primer
Intermediate: Macropoxy 646 Fast Cure Epoxy
Finish: Acrolon 218 HS Acrylic Polyurethane

232

SECTION 708 - PAINT SYSTEM C
Single-component moisture-cure Zinc urethane / Mio / U

NH 1.40 Single-component moisture-cure zinc-rich polyurethane primer

Generic type: Zinc-rich, single-component, moisture-cure polyurethane
 Vehicle type: Moisture-cure polyurethane
 Volume solids: 60% minimum
 Pigment type: 83% min. zinc dust in the dry film by weight
 Weight per volume: 22 pounds (2.64 kg/L) minimum
 VOC: 2.8 lb./gal. (340 g/L) maximum
 Recoat time: 4 to 6 hours minimum
 Color: Tinted to contrast with blasted steel

**NH 2.40 Single-component moisture-cure
 aromatic polyurethane with micaceous iron oxide (MIO) intermediate**

Generic type: MIO, single-component, moisture-cure aromatic polyurethane
 Vehicle type: Moisture-cure polyurethane
 Volume solids: 60% minimum
 Pigment type: 3.0 pounds/gallon micaceous iron oxide
 Weight per volume: 12-14 lb./gal. (1.4-1.68 kg/L) minimum
 VOC: 2.8 lb./gal. (340 g/L) maximum
 Recoat time: 6 to 8 hours minimum
 Color: To contrast with primer and finish coat

**Finish #1 - NH 3.41 Single-component moisture-cure
 aliphatic polyurethane with micaceous iron oxide (MIO) finish**

Generic type: Single-component, moisture-cure aliphatic polyurethane
 Vehicle type: Moisture-cure polyurethane
 Volume solids: 53% minimum
 Pigment type: 3.0 pounds/gallon micaceous iron oxide
 Weight per gallon: 12-14 pounds/gallon minimum
 VOC: 2.8 lb./gallon maximum
 Recoat time: 4 hours minimum
 Color: See 556.2.2.1.2 (9).
 Finish: Semi-gloss

Finish #2 - NH 3.43 Single-component moisture-cure aliphatic polyurethane finish

Generic type: Single-component, moisture-cure aliphatic polyurethane
 Vehicle type: Moisture-cure polyurethane
 Volume solids: 53% minimum
 Weight per volume: 11-12 pounds/gallon (1.3-1.4 kg/L) minimum
 VOC: 2.8 lb./gallon (420 g/L) maximum
 Recoat time: 4 hours minimum
 Color: See 556.2.2.1.2 (9).
 Finish: Semi-gloss

233

SECTION 708 - TABLE C
PAINT SYSTEM C - SC MC Zinc Urethane/ Mio / Urethane

The following list of paint system(s) are approved for the painting of structural steel cleaned to SP10. These coating(s) have been tested by NEPCOAT.

1. Wasser Corporation (www.wassercoatings.com)
4118 B PL NW-Suite B, Auburn, Washington 98001 (800)-627-2968
Local contact: Ben Forde (508)-930-0330

Primer: Wasser MC-Zinc
Intermediate: Wasser MC-Ferrox B
Finish #1: Wasser MC-Ferrox A
Finish #2: Wasser MC-Luster
Finish #3: Wasser MC-Antigraffiti

2. Xymax Coatings Incorporated
520 Cure Boivin, Boisbriand, PQ J7G2A7 Canada (450)-430-6780
Contact: Marc Schondorf

Primer: Xymax MonoZinc ME III
Intermediate: Xymax MonoFerro PUR
Finish #1: Xymax Bridge Finish (or Mono Brite for aluminum color)
Finish #2: Xymax MaxCoat HB
Finish #3: Xymax Maxcoat Clearcoat

SECTION 708 - PAINT SYSTEM D
Single-component moisture-cure penetrating sealer / Mio / U

NH 1.41 Single-component moisture-cure polyurethane penetrating sealer primer

Generic type: Single-component, moisture-cure polyurethane penetrating sealer
 Vehicle type: Moisture-cure polyurethane
 Volume solids: 60% minimum
 Weight per gallon: 8.5 pounds minimum
 VOC: 2.8 lb./gallon maximum
 Recoat time: After 4 hours minimum
 Color: Tinted to contrast with blasted steel

**NH 2.40 Single-component moisture-cure
 aromatic polyurethane with micaceous iron oxide (MIO) intermediate**

Generic type: MIO, single-component, moisture-cure aromatic polyurethane
 Vehicle type: Moisture-cure polyurethane
 Volume solids: 60% minimum
 Pigment type: 3.0 pounds/gallon micaceous iron oxide
 Weight per volume: 12-14 lb./gal. (1.4-1.68 kg/L) minimum
 VOC: 2.8 lb./gal. (340 g/L) maximum
 Recoat time: 6 to 8 hours minimum
 Color: To contrast with primer and finish coat

**Finish #1 - NH 3.41 Single-component moisture-cure
 aliphatic polyurethane with micaceous iron oxide (MIO) finish**

Generic type: Single-component, moisture-cure aliphatic polyurethane
 Vehicle type: Moisture-cure polyurethane
 Volume solids: 53% minimum
 Pigment type: 3.0 pounds/gallon micaceous iron oxide
 Weight per gallon: 12-14 pounds/gallon minimum
 VOC: 2.8 lb./gallon maximum
 Recoat time: 4 hours minimum
 Color: See 556.2.2.1.2 (9).
 Finish: Semi-gloss

Finish #2 - NH 3.43 Single-component moisture-cure aliphatic polyurethane finish

Generic type: Single-component, moisture-cure aliphatic polyurethane
 Vehicle type: Moisture-cure polyurethane
 Volume solids: 53% minimum
 Weight per volume: 11-12 pounds/gallon (1.3-1.4 kg/L) minimum
 VOC: 2.8 lb./gallon (420 g/L) maximum
 Recoat time: 4 hours minimum
 Color: See 556.2.2.1.2 (9).
 Finish: Semi-gloss

235

SECTION 708 - TABLE D
PAINT SYSTEM D - SC MC penetrating sealer / Mio / U

The following list of paint systems are approved for the painting of structural steel cleaned to SP3 or better:

1. Wasser Corporation (www.wassercoatings.com)
4118 B PL NW-Suite B, Auburn, Washington 98001 (800)-627-2968
Local contact: Ben Forde (508)-930-0330

Primer: Wasser MC-PrepBond
Intermediate: Wasser MC-Ferrox B or MC-Miomastic
Finish #1: Wasser MC-Ferrox A
Finish #2: Wasser MC-Luster

2. Xymax Coatings Incorporated
520 Cure Boivin, Boisbriand, PQ J7G2A7, Canada (450)-430-6780
Contact: Marc Schondorf

Primer: Xymax MonoLock (Penetration Primer) or XyGuard Aluminum
Intermediate: Xymax MonoFerro PUR
Finish #1: Xymax Bridge Finish (or Mono Brite for aluminum color)
Finish #2: Xymax MaxCoat HB

SECTION 708 - PAINT SYSTEM E**Single-component moisture-cure micaceous iron oxide zinc rich urethane / Tar / Tar****NH 1.43 Single-component moisture-cure micaceous iron oxide zinc-rich polyurethane primer**

Generic type:	Single-component, moisture-cure micaceous iron oxide- zinc rich polyurethane
Vehicle type:	Moisture-cure polyurethane
Volume solids:	60% minimum
Pigment type:	micaceous iron oxide / zinc dust
Weight per volume:	20 pounds (2.40 kg/L) minimum
VOC:	2.8 lb./gal. (340 g/L) maximum
Recoat time:	4 to 6 hours minimum
Color:	Tinted to contrast with blasted steel

NH 2.42 Single-component moisture-cure refined coal tar aromatic polyurethane with micaceous iron oxide (MIO)

Generic type:	Refined coal tar / micaceous iron oxide-filled, single-component, moisture-cure polyurethane
Vehicle type:	Moisture-cure polyurethane
Volume solids:	60% minimum
Barrier filler:	3 pounds/gallon micaceous iron oxide
VOC:	2.8 lbs./gallon maximum
Recoat time:	6 minimum
Color:	Red-oxide

NH 3.42 Single-component moisture-cure refined coal tar aromatic polyurethane with micaceous iron oxide (MIO)

Generic type:	Refined coal tar / micaceous iron oxide-filled, single-component, moisture-cure polyurethane
Vehicle type:	Moisture-cure polyurethane
Volume solids:	60% minimum
Barrier filler:	3 pounds/gallon micaceous iron oxide
VOC:	2.8 lbs./gallon maximum
Recoat time:	6 minimum
Color:	Black

SECTION 708 - TABLE E
PAINT SYSTEM E - SC MC Zinc Urethane/ Tar / Tar

The following list of paint systems are approved for the painting of structural steel cleaned to SP11 or better:

1. Wasser Corporation (www.wassercoatings.com)
4118 B PL NW-Suite B, Auburn, Washington 98001 (800)-627-2968
Local contact: Ben Forde (508)-930-0330

Primer: Wasser MC-Miozinc, or MC-Zinc
Intermediate: Wasser MC-Tar
Finish: Wasser MC-Tar

2. Xymax Coatings Incorporated
520 Cure Boivin, Boisbriand, PQ J7G2A7 Canada (450)-430-6780
Contact: Marc Schondorf

Primer: Xymax MonoZinc ME III
Intermediate: Xymax MonoGuard
Finish: Xymax MonoGuard

Table 1
Containment Criteria for Removal of Paint Containing Lead and Other Toxic Metals¹

Containment Removal Method	Containment SSPC Class ²	Containment Material Flexibility	Containment Material Permeability ³	Support Structure	Material Joints	Containment Entryway	Ventilation System Required	Negative Pressure Required	Exhaust Filtration Required
Hand Tool Cleaning ⁴	3P	Rigid or Flexible	Penetrable	Minimal	Partially Sealed	Open Seam	Natural	Not Required	Not Required
Power Tool Cleaning w/ Vacuum ⁴	3P	Rigid or Flexible	Penetrable	Minimal	Partially Sealed	Open Seam	Natural	Not Required	Not Required
Power Tool Cleaning w/o Vacuum ⁵	2P	Rigid or Flexible	Penetrable or Impenetrable	Rigid or Flexible	Fully or Partially Sealed	Overlapping or Open Seam	Natural ⁵	Not Required	Not Required ⁶
Chemical Stripping ⁶	3C	Rigid or Flexible	Chemical Resistant	Minimal	Partially Sealed	Open Seam	Natural	Not Required	Not Required ⁶
Vacuum Blast	4A	Rigid or Flexible	Penetrable or Impenetrable	Minimal	Partially Sealed	Open Seam	Natural	Not Required	Not Required
Wet Methods ⁷	2W	Rigid or Flexible	Impermeable	Rigid or Flexible	Fully Sealed	Overlapping	Natural ⁷	Not Required	Not Required ⁷
Abrasive Blast Cleaning ⁸	1A	Rigid or Flexible	Impenetrable	Rigid or Flexible	Fully Sealed	Airlock or Resealable	Mechanical	Required	Required
Pedestrian Walkways	N/A	Rigid	Impenetrable	Rigid	Fully Sealed	N/A	Natural	Not Required	Not Required

¹This table provides general design criteria only. It does not guarantee that specific controls over emissions will occur because unique site conditions must be considered in the design. Other combinations of materials may provide controls over emissions equivalent to or greater than those combinations shown above.

²The SSPC Classification is based on SSPC Guide 6. Note that for work over water, water booms or boats with skimmers should be employed, where feasible, to contain spills or releases. Debris must be removed daily at a minimum.

³Permeability addresses both air and water as appropriate. In the case of water or chemical removal methods, the containment materials must be resistant to both chemicals and water. Ground covers should always be impermeable, and of sufficient strength to withstand the impact and weight of the debris and the equipment used for collection and cleanup.

⁴Ground covers and/or free hanging tarpaulins may provide suitable controls over emissions without the need to completely enclose the work area.

⁵Ventilation is not required provided the emissions are controlled as specified in this Item, and provided worker exposures are properly controlled. If unacceptable worker exposures to lead or other toxic metals occurs, incorporate a ventilation system into the containment.

239

⁶Ground covers must always be impermeable and of sufficient strength to withstand the weight and impact of the debris and the equipment used for cleaning. If debris escapes through the seams, then additional sealing of the seams and joints is required. All containment materials and materials used for sealing must be resistant to both chemicals and water. If unacceptable worker exposures to lead or other toxic metals occurs, incorporate a ventilation system.

⁷This method applies to pressure washing, high pressure water jetting with and without abrasive, and wet abrasive blast cleaning. Ground covers must be water impermeable with fully sealed joints, and of sufficient strength and integrity to facilitate the collection and holding of the water and debris for proper disposal. Ventilation is not required provided the emissions are controlled as specified in this item, and provided worker exposures are properly controlled. If unacceptable worker exposures to lead or other toxic metals occur, incorporate a ventilation system into the containment.

⁸Ground covers must be of sufficient strength to withstand the impact and weight of the abrasive and the equipment used for cleaning. Ground covers must also extend beyond the containment boundary to capture escaping debris. If vacuum blast cleaning is employed, ground covers and/or fire hanging tarpaulins may provide suitable controls over emissions without the need to completely enclose the work area.

240

SUPPLEMENTAL SPECIFICATION**SECTION 562 – ELASTOMERIC SEALANT**

This supplemental deletes the existing language for Elastomeric Sealant for Section 562 and reallocates Section 562 for Silicone Joint Sealant.

Delete **SECTION 562 – ELASTOMERIC SEALANT**

Add **SECTION 562 –SILICONE JOINT SEALANT**

Description

1.1 This work shall consist of all work required to furnish and install silicone joint sealant as shown on the plans. The joint sealant shall consist of a cured-in-place silicone rubber material forming a flexible watertight seal.

Materials

2.1 Silicone joint sealant shall meet the requirements of ASTM D 5893 and shall be a product listed on the Qualified Products List. Silicone joint sealant for horizontal joints shall be either Type NS (Non-Sag) or Type SL (Self-Leveling). Silicone joint sealant for vertical joints shall be Type NS (Non-Sag).

2.2 Backer rod, when required, shall be expanded closed cell polyethylene, meeting the requirements of ASTM 5249.

2.3 Primer shall be a product recommended by the silicone joint sealer manufacturer.

Construction Requirements

3.1 GENERAL. The treatment of the steel, concrete, and stone surfaces and the preparation and installation of material shall be as recommended by the manufacturer.

3.1.1 Concrete shall have cured a minimum of 14 days prior to application of the primer and/or sealant.

3.1.2 The joint area shall be abrasive blast cleaned to achieve an anchor profile that is clean, and free of laitance, oil and foreign materials. Steel substrates shall receive an SSPC SP10 near-white metal blast cleaning or other treatment as directed by the Engineer prior to application of the primer. After blasting, all abrasives, dust and dirt shall be blown out of and away from the joint using a high-pressure air blast. All

equipment used for preparing and cleaning the joint shall be equipped with traps capable of providing moisture-free and oil-free air. All surfaces shall be dry and frost-free.

3.1.3 Primer shall be applied to all substrates to be sealed unless otherwise directed by the Engineer. The prime coat shall be applied in a thin, uniform layer over the entire contact surface area in accordance with the sealant manufacturer's recommendations.

3.1.3.1 The primer shall cure in accordance with the manufacturer's recommendations before application of the sealant. In all cases, the prime coat shall be allowed to dry for a minimum period of 60 minutes prior to the application of the sealant. The priming operation shall not be performed more than 3 hours ahead of the sealing operation at any given time.

3.1.4 The backer rod, when required, shall be installed at the appropriate distance below the finish grade surface. The width of the backer rod shall be approximately 25% wider than the joint opening.

3.1.5 Silicone sealant installation method and application tools shall be as recommended by the manufacturer. Non-sag sealants shall be tooled in place in accordance with the manufacturer's recommendations.

3.1.5.1 The silicone bead shall be no thicker than 1/2 in (13 mm) and no thinner than 1/4 in (6 mm). The top of the silicone bead shall be recessed 3/8 in (10 mm) below finish grade except below paved surfaces, where sealant shall be at top of concrete. For non-joint applications on the plans where sealant is specified to fill a void, the sealant shall be pressed into place to completely seal the void and tooled to shed moisture.

Method of Measurement

4.1 Silicone joint sealant will not be measured, but shall be the linear foot (linear meter) final pay quantities in accordance with 109.11 for silicone joint sealant required as shown on the plans. Material removed because of faulty workmanship will not be measured.

Basis of Payment

5.1 Silicone joint sealant is a final pay quantity item and will be paid for at the contract unit price linear foot per (linear meter) complete in place in accordance with 109.11. No additional payment will be made for the primer or backer material.

Pay item and unit:

562.1	Silicone Joint Sealant (F)	Linear Foot (Linear Meter)
-------	----------------------------	----------------------------

242

05/08/08

CONCORD
13742C

August 3, 2009

SPECIAL PROVISION**AMENDMENT TO SECTION 565 -- BRIDGE APPROACH RAIL****Item 565.222 – Bridge Approach Rail, T2 (Steel Posts) (F)****Item 565.232 – Bridge Approach Rail, T3 (Steel Posts) (F)****Item 565.242 – Bridge Approach Rail, T4 (Steel Posts) (F)****Add** to pay items and units:

565.222	Bridge Approach Rail, T2 (Steel Posts) (F)	Linear Foot
565.232	Bridge Approach Rail, T3 (Steel Posts) (F)	Linear Foot
565.242	Bridge Approach Rail, T4 (Steel Posts) (F)	Linear Foot

02/13/07

Page 1 of 1

SUPPLEMENTAL SPECIFICATION

SECTION 604 -- CATCH BASINS, DROP INLETS, AND MANHOLES

Amend 4.2 to read:

4.2 Reconstructing/adjusting, catch basins, drop inlets, or manholes will be measured by the linear foot (linear meter), vertically to the nearest 0.1 of a foot (meter), between the bottom of the metal frame or concrete top and the top of the undisturbed portion of the existing structure.

Amend 5.2 thru 5.2.2 to read:

5.2 The accepted quantities of reconstructed/adjusted catch basins, drop inlets, and manholes will be paid for at the contract unit price per linear foot (linear meter) complete in place, including reinstalling existing frames and grates or covers. A minimum of 1 foot (0.3 m) of reconstructing/adjusting will be paid for each structure measured.

5.2.1 No payment will be made for reconstructing/adjusting portions of the above structures which are unnecessarily disturbed.

5.2.2 No separate payment will be made for excavation for reconstructing/adjusting the above structures.

05/20/09

Page 1 of 1

CONCORD
13742C

August 3, 2009

.SPECIAL PROVISION**AMENDMENT TO SECTION 606 -- GUARDRAIL****Item 606.21___ – Double Faced Steel Beam Guardrail (Galvanized), _____****Add** to Description:

1.2 The Contractor shall furnish and install Double Faced Steel Beam Guardrail detailed on the plans or herein, at the locations shown on the plans, details or as ordered.

Amend Pay Items and Units Key for this item:

606.21ABC

- A Type of Post
 - 2 Medium Weight Steel (W6x8.5)
- B Post Spacing or Type of Unit
 - 0 "Standard Section" with 6 foot – 3 inch (1905 mm) spacing
 - 1 "Standard Section" with 6 foot – 3 inch (1905 mm) spacing and 6 FT Steel Posts
- C Rail Material
 - 3 Thrie Beam

- | | | |
|-----------|--|----------------------------|
| 606.21203 | Double Faced Steel Beam Guardrail (Galvanized),
Thrie Beam | Linear Feet (Linear Meter) |
| 606.21213 | Double Faced Steel Beam Guardrail (Galvanized),
Thrie Beam (6 FT Steel Posts) | Linear Feet (Linear Meter) |

245

August 5, 2009

SPECIAL PROVISION**AMENDMENT TO SECTION 606 -- GUARDRAIL**

- Item 606.312 – Single Faced Transition Rail, Steel Post**
- Item 606.315 – Single Faced Transition Rail, Wood Post**
- Item 606.322 – Double Faced Transition Rail, Steel Post**
- Item 606.3223 – Double Faced Transition Rail to Thrie Beam, Steel Post**
- Item 606.325 – Double Faced Transition Rail, Wood Post**
- Item 606.41211 – Transition Median Concrete Barrier, Precast**
- Item 606.41231 – Transition Single Slope Concrete Barrier, Precast**

This special provision provides for thrie beam transition rail and transition concrete barrier between median barrier and w-beam or thrie beam guardrail. All the requirements as set forth in the Standard Specifications are applicable except as modified or changed herein.

Add to Description:

1.2 The Contractor shall furnish and install thrie beam transition rail and transition concrete barrier units detailed on the plans or herein, at the locations shown on the plans, details or ordered.

Add to 2.15:

2.15 Materials required shall meet the Material Requirement for the class or type of work in accordance with the Standard Specifications or as ordered.

Add to 4.1:

4.1.4 Transition rail and transition concrete barrier will be measured by the unit as shown on the plans or as ordered.

Add to 5.1:

5.1.2 The accepted quantities of transition rail and transition concrete barrier will be paid for at the contract unit price.

246

Amend Pay Items and Units Key for this item:

606.3ABC

- | | |
|-------|--|
| A | Type of Rail |
| 1 | Single Faced |
| 2 | Double Faced |
| B | Type of Post |
| 2 | Steel Post (Medium weight steel (W6x8.5) |
| 5 | Wood Post (Round wood 6 inch \pm 1/2 inch at shoulder grade) |
| C | Transitioning To |
| Blank | W-Beam |
| 3 | Thrie Beam |

Examples:

606.312	Single Faced Transition Rail, Steel Post	Unit
606.315	Single Faced Transition Rail, Wood Post	Unit
606.322	Double Faced Transition Rail, Steel Post	Unit
606.3223	Double Faced Transition Rail to Thrie Beam, Steel Post	Unit
606.325	Double Faced Transition Rail, Wood Post	Unit
606.41211	Transition Median Concrete Barrier, Precast	Unit
606.41231	Transition Single Slope Concrete Barrier, Precast	Unit

2/26/2004
 ssd 10/14/03,7/14/1998

CONCORD
 13742C

August 3, 2009

SPECIAL PROVISION

AMENDMENT TO SECTION 606 -- GUARDRAIL

Item 606.4175 - Portable Concrete Barrier For Traffic Control - Anchored

Add to 3.7:

3.7.5 Portable concrete barrier for traffic control - anchored. The portable concrete barrier shall consist of 20 foot (6.0 meter) long sections and shall be anchored as detailed on the contract plans or as otherwise approved.

Add to 4.4:

4.4.3 Portable concrete barrier for traffic control - anchored will be measured by the linear foot (linear meter) for barrier ordered and delivered to the project. Relocating portable concrete barriers on the project will not be measured.

Amend 5.3 to read:

5.3 The accepted quantity of permanent concrete barrier of the type specified, portable concrete barrier for traffic control and portable concrete barrier for traffic control – anchored will be paid for at the contract unit price per linear foot (linear meter).

Add to 5.3

5.3.5 No separate payment will be made for the required anchoring of the portable concrete barrier.

Add to Pay items and units:

606.4175	Portable Concrete Barrier for Traffic Control - Anchored	Linear Foot (Linear Meter)
----------	---	----------------------------

**CONCORD
13742C**

August 13, 2009

SPECIAL PROVISION**AMENDMENT TO SECTION 616 – TRAFFIC SIGNALS****Item 616.161 – Traffic Signals (Temporary)**

This special provision provides for the construction of temporary traffic signals at the intersection of the I-93 Exit 14 Northbound On-ramp and Loudon Road in the City of Concord.

GENERAL:

All provisions of Section 616, except as modified or changed below, shall apply.

1. If the Contractor determines that the existing signal is required to be removed to assist the Contractor's work plan to perform the bridge deck replacement, the Contractor shall submit a plan to the Engineer for approval detailing a temporary signal to replace the existing mast arm.
2. The temporary signal shall connect to the existing controller and shall operate in the same manner as the existing signal. The existing signal phasing and timing plans shall not be altered.
3. The Contractor shall be responsible for signal operation and maintenance during the contract. The Contractor shall furnish the Contract Administrator, Transportation Management Center (TMC) (603-271-6862) and the City of Concord with names and phone numbers of persons to be contacted in case of malfunction. The contact person must be available 24 hours a day throughout the duration of the project contract. The Contractor shall also keep a signal log in the existing cabinet to track all maintenance work they complete on the signal system. This log shall be placed within in a plastic cover and shall at least include the description of the trouble call, corrective action taken, date, time, and personnel who completed the work.
4. The Contractor shall furnish and install wooden poles, back-guys, screw type anchors, span wires, signal heads, and necessary hardware to complete the temporary signal installation.
5. Minimum clearance to the bottom of the overhead signal housings shall be 16 feet (4.8 meters).

6. The Contractor shall install preemption receivers and indicators on the proposed span wire or to the proposed wood pole. Installation location and method shall be approved by the Engineer and the City of Concord.
7. The existing mast arm, signal heads, luminaire, and fire preemption equipment shall be removed and stored by the Contractor. Any damage to the existing signal equipment caused by the Contractor shall be repaired or the equipment shall be replaced at the Contractor's expense.

Add to 2.1:**2.1.6 List of Major Materials:**

- 3 - One-way, three-section, 12-inch span wire mount polycarbonate signal heads.
- 2 - Class IV, 40-foot (minimum) wood poles with back-guys, screw type anchors and overhead brackets.
- 1 - One-way temporary fire preemption including confirmation strobe light, receivers for the eastern leg of the intersection.

180 feet of 3/8-inch diameter, 7-strand utility grade galvanized span wire cable and miscellaneous attachments to poles and hangers for signal heads.

150 feet of aerial signal cable.

Add to Method of Measurement:

4.2 Temporary traffic signals will be measured as a unit. Where more than one unit is specified in the contract, separate item numbers will appear for each separate and complete unit.

Add to Basis of Payment:

5.4 The accepted quantity temporary traffic signals will be paid for at the contract lump sum price complete in place.

Add to Pay Items and Units:

616.161	Traffic Signals (Temp.)	Unit
---------	-------------------------	------

250

**CONCORD
13742C**

August 13, 2009

SPECIAL PROVISION**AMENDMENT TO SECTION 616 — TRAFFIC SIGNALS****Item 616.162 – Traffic Signals (Temporary)**

This special provision provides for the construction of temporary traffic signals at the intersection of the I-93 Exit 14 Southbound On-ramp and Off-ramp with Loudon Road in the City of Concord.

GENERAL:

All provisions of Section 616, except as modified or changed below, shall apply.

1. If the Contractor determines that the existing signal is required to be removed to assist the Contractor's work plan to perform the bridge deck replacement, the Contractor shall submit a plan to the Engineer for approval detailing a temporary signal to replace the existing mast arm.
2. The temporary signal shall connect to the existing controller and shall operate in the same manner as the existing signal. The existing signal phasing and timing plans shall not be altered.
3. The Contractor shall be responsible for signal operation and maintenance during the contract. The Contractor shall furnish the Contract Administrator, Transportation Management Center (TMC) (603-271-6862) and the City of Concord with names and phone numbers of persons to be contacted in case of malfunction. The contact person must be available 24 hours a day throughout the duration of the project contract. The Contractor shall also keep a signal log in the existing cabinet to track all maintenance work they complete on the signal system. This log shall be placed within in a plastic cover and shall at least include the description of the trouble call, corrective action taken, date, time, and personnel who completed the work.
4. The Contractor shall furnish and install wooden poles, back-guys, screw type anchors, span wires, signal heads, and necessary hardware to complete the temporary signal installation.
5. Minimum clearance to the bottom of the overhead signal housings shall be 16 feet (4.8 meters).

7. The Contractor shall install preemption receivers and indicators on the proposed span wire or to the proposed wood pole. Installation location and method shall be approved by the Engineer and the City of Concord.
8. The existing mast arm, signal heads, luminaire, and fire preemption equipment shall be removed and stored by the Contractor. Any damage to the existing signal equipment caused by the Contractor shall be repaired or the equipment shall be replaced at the Contractor's expense.

Add to 2.1:**2.1.6 List of Major Materials:**

- 4 - One-way, three-section, 12-inch span wire mount polycarbonate signal heads.
- 2 - Class IV, 40-foot (minimum) wood poles with back-guys, screw type anchors and overhead brackets.
- 1 - One-way temporary fire preemption including confirmation strobe light, receivers for the eastern leg of the intersection.

120 feet of 3/8-inch diameter, 7-strand utility grade galvanized span wire cable and miscellaneous attachments to poles and hangers for signal heads.

30 feet of aerial signal cable.

Add to Method of Measurement:

4.2 Temporary traffic signals will be measured as a unit. Where more than one unit is specified in the contract, separate item numbers will appear for each separate and complete unit.

Add to Basis of Payment:

5.4 The accepted quantity temporary traffic signals will be paid for at the contract lump sum price complete in place.

Add to Pay Items and Units:

616.162	Traffic Signals (Temp.)	Unit
---------	-------------------------	------

252

CONCORD
13742C

August 13, 2009

SPECIAL PROVISION

AMENDMENT TO SECTION 616 — TRAFFIC SIGNALS

Item 616.191 – Alterations to Traffic Signals

This special provision provides for the temporary alteration to the phasing plan of the existing traffic signal located at the intersection of Loudon Road with Fort Eddy Road and the Interstate 93 Exit 14 northbound off-ramp.

General

The phases for traffic traveling eastbound on Loudon Road shall be turned off. The phasing and timing for the other legs of the intersection shall remain unchanged. The original timing and phasing shall be returned by 7:00 AM Monday morning following the weekend closure as stated on the Contract Traffic Control Plans.

Add to Construction Requirements:

3.17 The existing traffic signal equipment shall be altered by an NHDOT approved signal contractor.

3.18 Any damage to the existing traffic signal equipment caused by the Contractor shall be replaced with new equipment equal to the existing equipment at the Contractor's expense.

Add to Method of Measurement:

4.2 Alterations to existing traffic signal equipment will be measured as a unit.

Add to Basis of Payment:

5.4 The accepted quantity of altering existing traffic signals will be paid for at the contract lump sum price complete in place. 50% of the payment will be made at the completion of the first weekend bridge closure and the remaining 50% of the payment will be made at the completion of the second weekend bridge closure.

Add to Pay Items and Units:

616.191 Alterations to Traffic Signals

Unit

253

August 13, 2009

SPECIAL PROVISION**AMENDMENT TO SECTION 616 — TRAFFIC SIGNALS****Item 616.451 – Traffic Signals Removal and Reinstallation**

This special provision provides for the removal and reinstallation of existing traffic signal equipment.

Add to Description:

1.3 This work shall consist of removing existing traffic signal equipment, storing the equipment, and reinstalling the traffic signal equipment in its original condition.

Add to Construction Requirements:

3.17 The existing traffic signals and equipment shall be removed and reinstalled by an NHDOT approved signal contractor.

3.18 Traffic signal equipment removed by the Contractor shall be stored by the Contractor such that the equipment is not damaged. Any damage to the existing traffic signal equipment caused by the Contractor shall be replaced with new equipment equal to the existing equipment at the Contractor's expense.

3.19 Remove and reinstall only those portions of the existing traffic signal as shown on the Contract Traffic Control Plans. The remaining components of the existing traffic signal shall remain in place and fully operational.

Add to Method of Measurement:

4.2 Removal and reinstallation of existing traffic signal equipment will be measured as a unit.

Add to Basis of Payment:

5.4 The accepted quantity of removing and reinstalling existing traffic signals will be paid for at the contract lump sum price complete in place. Payment shall include storage of the equipment.

Add to Pay Items and Units:

616.451	Traffic Signals Removal and Reinstallation	Unit
---------	--	------

255

1/15/08

Superseded: 2/2/200

CONCORD
13742C

August 4, 2009

SPECIAL PROVISION

AMENDMENT TO SECTION 616 -- TRAFFIC SIGNALS

Item 616.6__ -- Traffic Signal Detector Loop 6 ft by __ ft

Add to 4.1

4.1.1 Traffic signal loops will be measured by the each.

Add to 5.1

5.1.4 The accepted quantity of traffic signal loops will be paid for at the contract price per each. Saw cutting, installation of the loop flex pipe, loop splice kit, and traffic control will be subsidiary to the item.

5.1.5 Maintenance of Traffic will be subsidiary to the individual items of the contract.

Add to Pay items and units:

616.606	Traffic Signal Detector Loop 6' x 6'	Each
616.612	Traffic Signal Detector Loop 6' x 12'	Each
616.620	Traffic Signal Detector Loop 6' x 20'	Each
616.635	Traffic Signal Detector Loop 6' x 35'	Each
616.650	Traffic Signal Detector Loop 6' x 50'	Each

256

06/04/08

Page 1 of 1

SUPPLEMENTAL SPECIFICATION

AMENDMENT TO SECTION 618 – UNIFORMED OFFICERS AND FLAGGERS

Amend 3.2.2 to read:

3.2.2 All flagging personnel shall be trained by a designated trainer at least every three years. The course shall cover the topics outlined under 3.2.1. Each flagger shall receive from the designated trainer, a card or certificate that provides the date of training and the designated trainer's name. Upon request by the Contract Administrator, Contractors and subcontractors shall provide verification of training within 48 hours. Flaggers may elect to take a designated trainer course to meet the training requirements in this section

257

SUPPLEMENTAL SPECIFICATION

AMENDMENT TO SECTION 619 – MAINTENANCE OF TRAFFIC

Amend 5.2 and 5.2.1 to read:

5.2 Pavement markings, including temporary retroreflective paint pavement markings, will be paid for as provided in subsection 632.5.

5.2.1 Temporary raised pavement markings or temporary removable pavement marking tape required per 3.3, including maintenance, removal and disposal, will be subsidiary.

258

12/7/1998

1 of 2

Supersedes Spec. Prov. dated 10/17/97

**CONCORD
13742C**

August 3, 2009

SPECIAL PROVISION**AMENDMENT TO SECTION 619 -- MAINTENANCE OF TRAFFIC****Item 619.6 - Truck-Mounted Impact Attenuator, Test Level _****Add** to Description:

1.1.1 In order to improve the safety of the employees and reduce hazards to the traveling public the Contractor shall furnish and maintain truck-mounted impact attenuators.

Add to Materials:

2.3 The truck-mounted attenuator unit shall be designed to perform as a impact attenuator device meeting the requirements of the National Cooperative Highway Research Program (NCHRP) Report 350 for a truck mounted attenuator at a minimum of Test Level 2 [43.5 mph (70 km/h)] or Test Level 3 [62.1 mph (100 km/h)] as specified in the item description.

2.3.1 The following truck mounted attenuators are examples of the type of attenuator considered acceptable with the capability to meet the requirements specified in 2.1 above.

“ALPHA 100K” truck mounted attenuator as manufactured by Energy Absorption Systems, Inc. One East Wacker Drive, Chicago, Illinois 60601, Tel. (312) 467-6750 and distributed by Transpo Industries Inc., 20 Jones Street, New Rochelle, New York 10801-6098, Tel. (914) 636-1000

“MPS-350 III” truck mounted attenuator as manufactured and distributed by Trinity Industries Inc., 1170 N State Street, Girard, Ohio 44420, Tel (800) 321-2755.

“RENCO Ren-Gard 815 truck mounted attenuator, Test Level 2, as manufactured and distributed by Renco Highway Control Products.

2.3.2 Approval of other attenuators as "an equivalent" will be given on the basis of technical and related data submitted to the Engineer. Requests for approval shall be made in sufficient time to allow for the attenuator to be evaluated.

259

Add to 3.2:

3.2.9 Prior to the start of work operations that require its use, the Contractor shall have the required number of truck-mounted impact attenuators at the work site. This unit shall be attached to a truck of the type specified and shall follow each operation in a manner recommended by the manufacturer or as ordered.

3.2.9.1 A driver shall be supplied during mobile operations as warranted. The driver need not be in the truck at all times but shall be available to move the unit, as necessary, to insure a safe working area.

3.2.9.2 Sufficient energy absorbing cells or modules to restore the attenuator completely, after impact, shall be available at the project site in order to minimize any delay in construction operations.

3.2.9.3 The attenuator shall be relocated as necessary to provide protection to the traveling public and workers during construction.

3.2.9.4 Any device or device components damaged shall be replaced with new or refurbished parts intended for use as part of the attenuator device.

3.2.9.5 When the attenuator is no longer needed for the project, it shall remain the property of the Contractor and be removed.

Add To Method of Measurement:

4.4 A truck-mounted impact attenuator, test level 2 or test level 3 will be measured by the number of units ordered and supplied.

Add to Basis of Payment:

5.8 The accepted quantity of truck-mounted impact attenuators, test level 2 or test level 3 will be paid for at the contract unit price per each complete.

5.8.1 The necessary truck with a driver, as required, will be furnished subsidiary.

Add to pay items and units:

619.6_ Truck-Mounted Impact Attenuator, Test Level _ Each

260

10/01/08

Page 1 of 2

SUPPLEMENTAL SPECIFICATION**SECTION 632 -- RETROREFLECTIVE PAVEMENT MARKINGS**

This Supplemental Specification revises Retroreflective Pavement Marking Tape to conform to current ASTM standards, modifies the blackout tape thickness, and allows for placement of Identification Numbers to be placed prominently on tanks.

Amend 2.2, 2.3, and 2.4.1 to read:

2.2 Glass beads shall conform to AASHTO M 247 and shall be Type 1 with a moisture resistant coating.

2.3 Permanent Tape - Preformed retroreflective pavement marking tape for extended service life shall conform to ASTM D 4505, Retroreflectivity Level I or II, Adhesive Class 2 or 3, Skid Resistance Level A or B. Level I tape should be used when no external lighting source (i.e. overhead lighting) is present and Level II markings should be used when an external lighting source is present. The tape shall be a product listed on the Qualified Products List.

2.4 Temporary Tape - Retroreflective preformed pavement marking tape for limited service life shall conform to ASTM D 4592 Type I (Removable) or Type II (Non-removable). Type I tapes should be used in areas that require the tape to be removed in the future and Type II tapes should be used when the required service life of the tape is less than three months and can be left in place due to pavement overlay or other similar activity. Type I and II tapes shall have a minimum skid resistance of 45 BPN. The tape shall be a product listed on the Qualified Products List.

2.4.1 Blackout pavement marking tape shall conform to ASTM D 4592 Type I (Removable), except that the material shall be matte black and not be retroreflective. The tape shall be a product listed on the Qualified Products List.

Amend 2.5.5.3 to read:

2.5.5.3 The material shall be applied at a minimum thickness of 80 mils.

Construction Requirements

Amend 3.1.1 and 3.1.1.1 to read:

3.1.1 All pavement markings of the type specified shall be applied at the locations shown on the plans or as ordered, and shall be in accordance with the MUTCD and the NH Standard Plans for Road and Bridge Construction. Traffic control operations in conjunction with placing markings shall conform to 619 and the Traffic Control Plan.

261

3.1.1.1 The Contractor shall establish the base line points at 50 ft. (20 m) intervals on curves and 100 ft. (40 m) intervals on tangent sections throughout the length of pavement to be marked under this section from the Department provided control points. All other pavement markings shall be applied according to the physical pavement layout provided. The Contractor shall provide the pavement marking layout on the final wearing course pavement to the Engineer at least 3 working days prior to installation of the permanent pavement markings unless otherwise permitted.

Amend 3.2.1 to read:

3.2.1 All equipment used for highway striping shall be specifically designed and manufactured for that purpose by a company experienced in the design and manufacture of such equipment and approved for use. Equipment used for longitudinal lines shall be mounted on a truck having a minimum gross vehicle weight rating of 14,000 lb (6350 kg) with a minimum paint tank capacity of 60 gal (225 L), and shall have the capability of placing double lines up to 4 in. (100 mm) in width or single lines up to 12 in. (300 mm) in width in one pass. Each paint tank shall be plainly marked in a prominent place with the maximum filled capacity of the tank. Each tank shall have a mixer or aerator capable of combining and maintaining the ingredients of the paint into a thoroughly mixed and uniform mass. The paint shall be applied with an atomizing or airless spray type striping machine having the waterbase paint at a temperature of 105 °F (40 °C) maximum in the heat exchanger and 85 – 105 °F (30 – 40 °C) at the spray nozzle. Paint shall pass through a screen with a maximum opening of 1/8 of an inch (3.175 mm) located before the heat exchanger. A valve accessible for sampling shall be located in the paint feed line between the screen and the heat exchanger. The striping machine shall be equipped with an automatic paint stripe controller having skip-line capability to place broken lines in accordance with 3.1.3 and the NHDOT Standard Plans. A gauge reading paint temperature shall be mounted and conveniently displayed on the equipment. The equipment shall include a mechanical, glass-bead dispenser mounted not more than 12 in. (300 mm) behind the paint dispenser. All equipment shall be kept in good operating condition.

Revise the KEY TO ITEM NUMBERS FOR PAVEMENT MARKINGS as follows:

- .5 Preformed Retroreflective Tape, Level I
- .6 Preformed Retroreflective Tape, Level II

Examples (ENGLISH):

632.5104. Preformed Retroreflective Tape, Level I,
4 in Line Linear Foot

Examples (METRIC):

632.5110. Preformed Retroreflective Tape, Level I,
100 mm Line Linear Meter

262

02/11/09

SSD: 10/01/08, 01/06/09

Page 1 of 3

SUPPLEMENTAL SPECIFICATION**SECTION 645 – EROSION CONTROL**

This Supplemental Specification updates the current Section 645 specification by revising Permanent Erosion Control to Erosion Control Products (Rolled Erosion Control Products), clarifies the Mulch section, and amends/adds pay items and descriptions.

Amend 1.1 to read:

1.1 Erosion Control Products. This work shall consist of furnishing and placing hay mulch, bark mulch, “Rolled Erosion Control Products” (RECP), or other material, to provide soil stabilization and/or erosion control on slopes or in channels at locations shown on the plans or where ordered.

1.1.1 Temporary Slope Stabilization Type A shall be a temporary, photodegradable or biodegradable RECP specified for protection of slopes of 3:1 or flatter. This material may also be specified for temporary protection of channels expected to experience flow-induced shear of 1.5 lbs/ft² or less. These products shall maintain their functional integrity for a minimum of 12 months and then degrade.

1.1.2 Temporary Slope Stabilization Type B (Wildlife friendly) shall be a temporary, biodegradable RECP specified for protection of slopes of 3:1 or flatter in areas where wildlife ensnarement is a concern. This material may also be specified for temporary protection of channels expected to experience flow-induced shear of 1.5 lbs/ft² or less. These products shall maintain their functional integrity for a minimum of 12 months and then biodegrade.

1.1.3 Temporary Slope Stabilization Type C shall be a temporary, photodegradable or biodegradable RECP specified for protection of slopes of 1½:1 or flatter. This material may also be specified for temporary protection of channels expected to experience flow-induced shear of 2.0 lbs/ft² or less. These products shall maintain their functional integrity for a minimum of 12 months and then degrade.

1.1.4 Temporary Slope Stabilization Type D (Wildlife friendly) shall be a temporary, biodegradable RECP specified for protection of slopes of 1½:1 or flatter in areas where wildlife ensnarement is a concern. This material may also be specified for temporary protection of channels expected to experience flow-induced shear of 2.0 lbs/ft² or less. These products shall maintain their functional integrity for a minimum of 12 months and then biodegrade.

1.1.5 Permanent Channel Stabilization Type A shall be a permanent “Turf Reinforcement Mat” (TRM) specified for permanent protection of channels or ditches that are expected to experience flow-induced shear of 3.0 lbs/ft² or less.

263

1.1.6 Permanent Channel Stabilization Type B shall be a permanent TRM specified for permanent protection of channels or ditches that are expected to experience flow-induced shear of 5.0 lbs/ft² or less.

Amend 1.2 to read:

1.2 Blank.

Amend 2.1 to read:

2.1 Mulch

2.1.1 Hay mulch shall consist of cured hay, free from noxious weeds and rough or woody materials.

2.1.2 Bark mulch shall be bark chippings graded to be approximately 3/8 to 2 in (10 to 50 mm) in width. The chippings shall not have been stored so long and under such conditions that the material has decomposed sufficiently so that it is lost its fibrous texture. Bark mulch must be approved as to grading and condition prior to its use.

2.1.3 Temporary mulches shall be hay, straw, fiber mats, netting, wood cellulose, bark, chips, or other approved material. The mulch shall be reasonably clean and free of noxious weeds and materials toxic to plant growth.

Amend 2.2 to read:

2.2 Slope and channel stabilization products of the type specified shall be a Rolled Erosion Control Product (RECP) that is listed on the Qualified Products List.

Amend 3.4 to read:

3.4 Rolled Erosion Control Products (RECP)

3.4.1 Rolled Erosion Control Products (RECP), of the type specified, shall be installed where shown on the plans or as directed by the Engineer.

3.4.2 RECPs for slope and channel stabilization shall be installed as per the manufacturer's recommendations for the specific application and site conditions, or as directed by the Engineer. Documentation from the manufacturer describing recommended installation procedures shall be provided to the Engineer at least 10 working days prior to installation.

3.4.3 Surfaces of ditches and slopes to receive RECPs shall conform to the grades and cross sections shown on the plans and shall be finished to a smooth and even condition with all debris, roots, stones, and lumps raked out and removed. Unless otherwise directed, soil shall be

264

prepared, including the application of lime, fertilizer and seed, prior to installation of the specified type of RECP.

3.4.4 The RECP shall be placed so that is in intimate contact with the soil surface over the entire installation. Site conditions may require the use of additional staples to assure that this contact is maintained. The RECP shall not be stretched.

3.4.5 RECPs shall be buried at the top of slope and around the edges of catch basins and other structures or obstructions as recommended by the manufacturer.

3.4.6 In the event that the RECP installation becomes damaged, undermined, or raised off of the soil surface by vegetation, it shall be repaired immediately as per manufacturer's recommendations.

Amend 4.2 to read:

4.2 Rolled Erosion Control Products (RECP) will be measured by the square yard (square meter), based on the dimensions of the exposed surface area of the product.

Amend 5.1 to read:

5.1 The accepted quantities of erosion control work will be paid for at the contract unit price per square yard (square meter) or per acre (hectare) for mulch and per square yard (square meter) for Rolled Erosion Control Products (RECP), complete in place.

Delete Pay items and units:

645.2	Matting for Erosion Control	Square Yard (Square Meter)
645.21	Slope Stabilization (2:1 or Flatter)	Square Yard (Square Meter)
645.22	Slope Stabilization (Steeper than 2:1)	Square Yard (Square Meter)
645.23	Channel Stabilization (Low Velocity)	Square Yard (Square Meter)
645.24	Channel Stabilization (High Velocity)	Square Yard (Square Meter)
645.25	Permanent Stabilization	Square Yard (Square Meter)

Add Pay items and units:

645.41	Temporary Slope Stabilization Type A	Square Yard (Square Meter)
645.42	Temporary Slope Stabilization Type B (Wildlife friendly)	Square Yard (Square Meter)
645.43	Temporary Slope Stabilization Type C	Square Yard (Square Meter)
645.44	Temporary Slope Stabilization Type D (Wildlife friendly)	Square Yard (Square Meter)
645.45	Permanent Channel Stabilization Type A	Square Yard (Square Meter)
645.46	Permanent Channel Stabilization Type B	Square Yard (Square Meter)

04/08/09

Page 1 of 7

SUPPLEMENTAL SPECIFICATION

AMENDMENT TO SECTION 600 – INCIDENTAL CONSTRUCTION

AMENDMENT TO SECTION 645– EROSION CONTROL

**Storm Water Pollution Prevention Revisions and the
Addition of Item 645.48 - Erosion Control Mix**

Amend 1.3 to read:

1.3 Storm Water Pollution Prevention Plan (SWPPP). This work shall consist of a temporary erosion and sediment control and storm water management plan, hereinafter called the **Storm Water Pollution Prevention Plan or “SWPPP”**. The work includes all necessary preparations for submissions and revisions of the SWPPP to obtain approval by the Department. This work shall also include monitoring the approved SWPPP during all phases of construction.

1.3.1 The Department will furnish the following data to the Contractor:

- Specific reproducible plan sheets and cross-sections of the project, as requested,
- Drainage calculations and plans (drainage area size and characteristics; runoff volume; type, size, and slope of pipes; invert elevations; and outlet velocities), as available,
- Geotechnical Report including soil boring logs, soil types, and test pit data, as available,
- Permits and certifications obtained for the project, and
- A list of environmental commitments.
- A copy of the NHDOT’s Notice of Intent application.
- A copy of the NHDOT’s Acknowledgement letter from EPA
- Documentation of permit eligibility related to federally listed threatened and endangered species NHDES Wetlands Permit “Plan of Record”.

1.3.2 Recommended guides for the preparation of the SWPPP are the National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP), **June 30th, 2008 (73 FR 40338)**. The AASHTO Highway Drainage Guideline, Volume III, *Guidelines for Erosion and Sediment Control in Highway Construction*, available from the American Association of State Highway and Transportation Officials, Inc., 444 North Capitol St. N.W., Suite 249, Washington, D.C. 20001; the *New Hampshire Stormwater Management Manual, Volume 3, Construction Phase Erosion and Sediment Controls* available from the New Hampshire Department of Environmental Services (NHDES) Public Information and Permitting Office, PO Box 95, 6 Hazen Drive, Concord, NH 03302-0095, Telephone (603) 271-2975 and the Rockingham County Conservation District in Exeter, NH, Telephone (603) 772-4385; the NHDOT Guidelines for Temporary Erosion and Sediment Control and Stormwater Management (May 2002).

1.3.3 The SWPPP shall be consistent with the provisions of 107.01.

266

Add to Materials:

2.11 Erosion Control Mix

2.11.1 Erosion control mix shall be placed to provide for temporary control of erosion or sedimentation including, slope stabilization, check dams and berms, inlet control or where ordered.

2.11.2 The mix shall have an organic portion between 25% and 65%, dry weight basis, and be fibrous and elongated such as from shredded bark, stump grindings, composted bark, or equivalent manufactured products. The mix shall not contain silts, clays, or fine sands.

2.11.3 The mix shall have a pH between 5.0 and 8.0 and a particle size by weight of 100% passing a 3-inch screen, 90% to 100% passing a 1-inch screen, 70% to 100% passing a 0.75-inch screen, and 30% to 75% passing a 0.25-inch screen.

Amend 3.1 to read:

3.1.1 Prior to the start of any land disturbance activities, the Contractor shall submit four sets of the Storm Water Pollution Prevention Plan (SWPPP) described in 3.2 for approval in accordance with 105.02 for clearing, grubbing, grading, drainage and bridge structures, especially in or adjacent to existing waters, water courses and wetlands. The Department's review time will be proportional to the complexity of the SWPPP and will be within 15 working days. No work requiring erosion/ sediment control shall commence until the SWPPP has been approved. Names of designated personnel to perform field monitoring shall be included in the submittal. The SWPPP may be submitted in phases or for specific construction areas **addressing the maximum open area allowed in section 3.1.4. Only work within areas covered by an approved SWPPP will be allowed to be performed.**

Amend 3.1.2 to read:

3.1.2 Permanent and temporary erosion control features shall be incorporated into the project at the earliest practicable time, as specified on the plans, as stated in 107.01, and as outlined in the approved SWPPP. Temporary erosion and sediment control measures shall be used to correct conditions that develop during construction to temporarily control erosion not associated with permanent control features.

Amend 3.1.4 through 3.1.13 to read:

3.1.4 The maximum amount of allowed disturbed earth material exposed shall not exceed a total of 5 acres for all operations within the right-of-way at any one time. The Contractor may be permitted to exceed the maximum open area allowed, with approval from the Department, provided the Contractor's SWPPP shows adequate provisions to control erosion and sediment, provided the additional area of disturbance is necessary to meet the Contractors Critical Path Method schedule (CPM), and the contractor can demonstrate there are adequate resources available (equipment & manpower) to respond to multiple events simultaneously. In addition, the SWPPP shall show stabilization procedures for any areas that are inactive for more than fourteen days. The SWPPP shall identify when exposed material will be protected from erosion and when temporary and permanent erosion control measures will be installed.

3.1.5 For the construction period between November 30th through May 1st the area of exposed, unstablized soil shall be limited to one acre. The allowable area of exposed soil may be increased provided a winter construction plan shows adequate provisions to control erosion and sediment, provided the additional area of disturbance is necessary to meet the Contractors Critical Path Method schedule (CPM), and the contractor can demonstrate there are adequate resources available (equipment & manpower) to respond to multiple events simultaneously and is reviewed and approved by the Department.

3.1.6 The Engineer will limit the area of clearing, grubbing, excavation, borrow and embankment operations commensurate with the Contractor's capability and progress and in no case shall exceed a total of 5 acres without prior approval, in keeping the finish grading, mulching, seeding, erosion and sediment control measures concurrent with operations in accordance with the accepted SWPPP.

3.1.7 Earth excavation and embankment slopes shall be permanently or temporarily treated for stabilization before the time the slant height of exposed slopes reaches 30 ft. (9 m), unless otherwise approved. Where construction activities are completed within the growing season, all exposed soil areas shall be permanently stabilized within 14 calendar days. Where construction activities are temporarily suspended or completed outside of the growing season, all exposed soil areas shall be treated for stabilization within 14 calendar days.

3.1.8 An area shall be considered "stabilized" when it is in a condition in which the soils on the site will not erode under the conditions of a 10-year storm.

3.1.9 As work progresses, patch seeding and mulching shall be done as required on areas previously treated to maintain or establish protective cover.

3.1.10 Drainage pipes and ditches shall be constructed in a sequence from outlet to inlet in order to stabilize outlet areas and ditches before water is directed to the new installation or any portion thereof unless conditions unique to the location warrant an alternative method. If this unique condition exists, the alternative method will require written approval.

3.1.11 Channel and ditch work, including erosion protection shall be completed before diverting the drainage to these areas.

3.1.12 In the event of conflict between these requirements and erosion and sediment control laws, rules or regulations of other Federal, State or local agencies, the more restrictive laws, rules or regulations shall apply.

3.1.13 In case of failure on the part of the Contractor to provide and maintain effective temporary erosion and sediment control, as determined by the Engineer, the Department reserves the right to employ outside assistance or to use its own forces to provide the necessary corrective measures.

Amend 3.2 to read:

3.2 Storm Water Pollution Prevention Plan. (SWPPP)

3.2.1 This Item addresses the preparation and implementation of a SWPPP required by the National Pollutant Discharge Elimination System (NPDES) and applicable Construction General Permit

268

(CGP). The **SWPPP** shall be prepared, stamped and signed by a Licensed Professional Engineer registered in the State of New Hampshire, and a **Certified Professional Erosion and Sediment Control Specialist (CPESC)**, qualified to prepare erosion and sediment control plans, hereinafter called the "Preparer". Collaboration with other professionals such as soil scientists, geologists and environmentalists may be required as appropriate.

3.2.1.1 Qualifications for the **SWPPP** Preparer include a minimum of 5 years experience or knowledge of highway and bridge construction operations, with knowledge of methods of construction, demonstrated knowledge of erosion and sediment control, and stormwater management measures. The preparer shall have previously submitted accepted plans to the New Hampshire Department of Environmental Services (NHDES) under RSA 485-A:17 Terrain Alteration, or have prepared accepted plans under the National Pollutant Discharge Elimination System permit program.

3.2.1.2 The Preparer may monitor the **SWPPP** or designate a representative to monitor the **SWPPP**. If the Preparer chooses to utilize a representative, the qualifications for this **SWPPP** Monitor shall include a minimum of 2 years experience or knowledge of highway and bridge construction and be certified as a **Certified Erosion Sediment and Storm Water Inspector (CESSWI)** with knowledge of methods of construction, demonstrated field knowledge of erosion control measures; their design, effectiveness, and maintenance requirements.

3.2.1.3 The Contractor shall submit the name and qualifications of the person or firm proposed to prepare the **SWPPP** to the Engineer for approval prior to preparing the **SWPPP**. Submittal of the name and qualifications will be accepted after the opening of bids.

3.2.2 The Construction General Permit (CGP) also requires the preparation and implementation of a **SWPPP** in accordance with the afore-mentioned statutes and regulations. The **SWPPP** will include the CGP conditions and detailed descriptions of controls of erosion and sedimentation to be implemented during construction. It is the responsibility of the Contractor to prepare the **SWPPP** to meet the requirements of the most recently issued CGP. The Contractor shall submit the **SWPPP** to the Engineer for approval prior to any soil disturbance activities. It is the responsibility of the Contractor to be familiar with the CGP conditions and the conditions of any state Wetlands permit, Water Quality Certification, Corps of Engineers Section 404 Permit and other state and federal environmental permits applicable to this project and to include in the **SWPPP** the means and methods necessary to comply with applicable conditions of said permits.

It is the responsibility of the Contractor to complete the **SWPPP** in accordance with the EPA Construction General Permit, provide all information required, and obtain any and all certifications as required by the Construction General Permit. Any amendments to the **SWPPP** required by site conditions, schedule changes, revised work, construction methodologies, and the like are the responsibility of the Contractor. Amendments will require the approval of the Engineer prior to implementation.

The Contractor is responsible for preparation of the **SWPPP**, all **SWPPP** certifications, inspections, reports and any and all corrective actions necessary to comply with the provisions of the CGP.

3.2.2.1 A schedule of construction phasing, including maximum open area allowed, and a schedule for monitoring and maintaining the **SWPPP** shall also be included. BMP's for seasonal (i.e. cold weather/frozen ground, from November 30th through May 1st) applications shall be identified.

The construction phasing shall address the various erosion and sediment control and storm water management measures to be implemented at each phase of construction. Phases shall be as shown on the Traffic Control Plan, Prosecution of Work, or as required by the Contractor's approved **construction sequence plan**.

3.2.2.2 Turbidity limitations in receiving waters noted in 107.01 shall be addressed in the **SWPPP**.

3.2.2.3 Department plan drawings will show the construction site(s) conditions prior to and after construction by including property lines, right-of-way lines, easements, existing and new structures, drainage, flood plains, wetlands, limits of clearing and grading, proposed final drainage, detours, permanent erosion and sediment control measures, and other critical items. The Contractor's plan drawings shall show temporary drainage and erosion and sediment control measures for the construction site(s) on the contract plans provided by the Department. Additionally the Contractor shall provide plans showing all of the above items for proposed areas related to the construction site(s) not shown on the Department's contract plans, including but not limited to, access and haul roads, equipment and material storage sites, material pits, material processing sites, and disposal areas, except municipally authorized landfill areas and commercial sites. Waste materials are quite often materials unsuitable for embankment construction and generally very susceptible to erosion; therefore, the Contractor shall pay close attention to controlling erosion of these materials.

3.2.2.4 Additional design typicals illustrating practices for erosion and sediment control not shown on the Department plans shall be included in the **SWPPP**. Calculations shall be included to verify all erosion and sediment control and stormwater management practices such as, but not limited to, sediment retention and detention basins, energy dissipaters, diversions, waterways, and control of runoff.

3.2.3 The Preparer or the Preparer's designated representative shall assist the Contractor in implementing the **SWPPP**, monitor the site for compliance with the **SWPPP** and recommend modifications to the **SWPPP** for changing operations or inadequate erosion and sediment control and stormwater management measures and shall **attend weekly (or as required by the Engineer) meetings**. The Preparer shall make modifications to the **SWPPP** as necessary and resubmit for review and approval in accordance with 3.1.1. Review time of modifications will be within 10 working days of submittal.

3.2.3.1 Monitoring **SWPPP** and Erosion and Sediment Control shall include on-site reviews, weekly and within 24 hours after any storm event greater than 0.5 in. (13 mm) of rain per 24 hour period **and producing meeting minutes of the weekly meetings for distribution as required**. A monitoring report prepared by the **SWPPP** Monitor stating the inspection date, name, title, qualifications and signature of person performing the inspection, weather information for the period since the last inspection, weather information at the time of inspection, locations and description of any discharges, a summary of construction activities undertaken during the reporting period, general site conditions, erosion control maintenance and corrective actions taken, the anticipated schedule of construction activities for the next reporting period, any **SWPPP** amendments, and representative photographs.

A copy the monitoring report and weekly meeting minutes shall be provided to the Engineer and maintained on file with the **SWPPP** at the project site.

3.2.3.2 The Engineer may order modifications to the **SWPPP** for changing operations or for inadequate erosion and sediment control and stormwater management measures. Changes and/or modifications shall be noted by the **SWPPP** Preparer on the approved **SWPPP** located at the project site.

3.2.3.3 The Preparer of the **SWPPP** shall be available for on-site consultations with the Engineer within 24 hours of request.

3.2.4 Project work may be suspended, wholly or in part, with no extension of time or additional compensation for failure to implement and maintain the approved **SWPPP**, including modifications, in accordance with 105.01.

Amend 3.10 to read:

3.10 Maintenance.

3.10.1 Erosion control features shall be maintained by the Contractor throughout the life of the project.

Add 4.8:

4.8 Erosion Control Mix will be measured per CY (cubic meter) in accordance with 109.01.

Amend 5.6 to read:

5.6 The accepted Storm Water Pollution Prevention Plan (**SWPPP**) will be paid for at the contract lump sum price. Initial payment will be up to **25** percent of the amount bid upon approval of the **SWPPP** for the entire project. Subsequent payments will be made periodically based on the anticipated construction period **and proposed construction sequence.**

Amend 5.6.2 to read:

5.6.2 The accepted quantities of Monitoring **SWPPP** and Erosion and Sediment Controls will be paid for at the contract unit price per hour.

Amend 5.6.3 to read:

5.6.3 Erosion and Sediment Control and Stormwater Management items necessary to implement and maintain the **Storm Water Pollution Prevention Plan (SWPPP)** for the construction site(s) will be paid for under the appropriate Items of 645 or as provided under Section 699.5.

Amend 5.7 through 5.10 to read:

5.7 The accepted quantity of erosion stone will be paid for at the contract unit price per ton (ton) delivered to the project, **complete in place**, including any required excavation and stone removal, as ordered.

5.8 The accepted quantity of erosion control mix will be paid for at the contract unit price per CY (cubic meter) delivered to the project, complete in place, including any required stump grinding, excavation, as ordered.

5.9 The Contractor shall maintain areas with permanent control, with no extra compensation, until the completion of the contract.

5.9.1 Repair and maintenance of damaged or failed slopes, until project acceptance as stated in section

5.9.2 The Department reserves the right to employ outside assistance or to use its own forces to provide the necessary corrective measures and deduct the cost from money due the Contractor and/or withhold progress payments.

5.10 Erosion control measures including dust control required for stockpiles of materials subject to wind or water erosion shall be at the expense of the Contractor.

Add to Pay items and units:

645.48	Erosion Control Mix	CY (Cubic Meter)
--------	---------------------	------------------

272

02/18/09

1 of 2

Supersedes 8/24/98, 2/8/2001, 12/10/04

**CONCORD
13742C**

August 3, 2009

SPECIAL PROVISION**SECTION 670 -- MISCELLANEOUS INCIDENTALS****Item 670.045X - Construct and Remove Detour
Item 670.046X - Construct and Remove Temporary Widening****Description**

1.1 This work shall consist of constructing and removing detour(s) or temporary widening(s) at locations shown on the plans; as determined by the Traffic Control Plan; or ordered. All work for detours and widenings shall include temporary sidewalks where required. The typical section to define the earthwork (excavation and embankment), side slopes, shoulders, base courses and pavement requirements will be as shown on the plans or as ordered.

Materials

- 2.1** Earthwork materials shall conform to 203.2.
- 2.2** Aggregate base course materials shall conform to 304.2.
- 2.3** All other materials necessary to construct detour or widening shall conform to the material requirements of the respective items.

Construction Requirements

- 3.1** Detour or widening shall be constructed as shown on the plans or the Contractor may propose an alternate plan.
- 3.2** Excavation and embankment shall be constructed in accordance with pertinent provisions of 203.3.
- 3.3** Drainage items shall be installed where necessary or as directed and constructed in accordance with the pertinent provisions of 603.3 and 604.3.
- 3.4** Aggregate base courses shall be constructed to the depth and width shown on the plans in accordance with the pertinent provisions of 304.3.

3.5 Required pavement shall be constructed as shown on the plans in accordance with the pertinent provisions of 401.3 and 403.3.

3.6 All other items necessary to construct an approved detour or widening shall be constructed in accordance with the pertinent provisions of the item.

3.6.1 Material(s) not required for the final roadway configuration shall be removed. Material meeting the item specifications after removal may be used elsewhere on the project under appropriate items.

3.6.2 Disposal of unsuitable material(s) removed from a detour or widened area shall be the responsibility of the Contractor as set forth in the provisions of Section 203.3.9.

Method of Measurement

4.1 Construct and remove detour or widening will be measured as a unit. A unit shall consist of design, if required, all earthwork (including topsoil excavation), aggregate base courses, slope treatment, bituminous curb, sidewalks, the maintenance of traffic including installing, maintaining and removing construction signs and warning devices and any work not described in 4.1.1. When more than one unit is specified in the Contract, separate item numbers will appear for each separate and complete unit.

4.1.1 Constructing and removing temporary bridges, drainage items, pavement, guardrail and concrete barrier, performing clearing and grubbing and installing and maintaining erosion control measures, pavement markings, and delineators will be measured as provided under the respective items.

Basis of Payment

5.1 The accepted quantity of construct and remove detour or widening will be paid for at the contract lump sum price.

5.1.1 Removal of items necessary to provide an approved detour or widening and not needed for the final roadway configuration, including earthwork, bituminous curb and any item not specified in 5.1.2 will be subsidiary to construct and remove detour.

5.1.2 Constructing and removing temporary bridges, drainage items, pavement, guardrail and concrete barrier, performing clearing and grubbing, and installing and maintaining erosion control measures, pavement markings, and delineators will be paid as provided under the respective items.

Pay items and units:

670.045X	Construct and Remove Detour	Unit
670.046X	Construct and Remove Temporary Widening	Unit

274

6/29/07

1 of 2

Supersedes 6/11/07

**CONCORD
13742C**

August 19, 2009

SPECIAL PROVISION**SECTION 670 -- MISCELLANEOUS INCIDENTALS**

- Item 670.104 - Temporary Portable Lighting (Unit)**
Item 670.105 - Temporary Portable Lighting (Unit/Week)

Description

1.1 Work shall consist of furnishing, maintaining, relocating and the removal of temporary portable lighting provided by portable light towers as described herein, shown on the plans, described in the Prosecution of Work or as ordered.

1.1.1 This work shall include providing and maintaining a power source(s) adequate for the requirements and duration of the lighting.

Materials

2.1 Lighting shall operate four 250-watt metal halide lamps. Light system shall contain a ballast and shall provide an NEMA-6 beam spread.

2.1.1 Lights shall be full cut-off.

Construction Requirements

3.1 Light towers shall be placed as shown on the plans at the angle point in the concrete barrier.

3.1.1 Lights shall be aimed directly down and not to blind the traveling public.

3.1.2 Light towers shall have a minimum tower height of 30 Feet.

3.2 The Contractor shall insure that temporary portable lighting is installed as part of the temporary concrete barrier installation.

3.3 The Contractor shall insure that temporary portable lighting is operating during night hours and not operating during daylight hours.

3.4 Fuel source shall maintain light operations for a minimum of 14 continuous hours (dusk to dawn).

3.5 If temporary portable lighting is proposed at locations other than as shown on the plans, the Contractor shall submit plans for approval in accordance with 105.02 prior to the start of operations.

3.6 Temporary portable lighting shall be removed at the completion of the project or when no longer required.

Method of Measurement

4.1 Temporary portable lighting will be measured as a unit. A unit will include all work, material, equipment, hardware, required power and appurtenances as necessary to provide temporary lighting. Relocating light towers will not be measured.

4.1.1 Temporary portable lighting (unit/week) will be measured as a unit week. A week shall consist of seven consecutive days beginning from when the item is first used on the project. The number of units required each week will be specified in the Traffic Control Plan or as approved.

Basis of Payment

5.1 The accepted quantity of temporary portable lighting will be paid for at the contract lump sum price complete.

5.1.1 All costs for obtaining permits for temporary portable lighting will be subsidiary.

5.1.2 The accepted quantity of temporary portable lighting (unit/week) will be paid for at the contract unit price complete. Payment will be made based on the use for each unit, whether used once or multiple times during the week.

Pay item and unit:

670.104	Temporary Portable Lighting	Unit
670.105	Temporary Portable Lighting	Unit/Week

**CONCORD
13742C**

August 19, 2009

SPECIAL PROVISION**AMENDMENT TO SECTION 670****Item 670.5 – Temporary Shuttle Service****Description**

1.1 This work shall consist of providing a temporary shuttle service for transporting pedestrians and bicyclists across Interstate 93 in the City of Concord during the closure of Loudon Road (NH Route 9).

Materials

2.1 The contractor shall furnish an 8-passenger ADA/lift-equipped van with a rack capable of carrying 2 bicycles including fully licensed and insured operators for all hours of operation. The service may not be suspended for any reason, including equipment breakdown, for more than one hour. In the event of equipment breakdown, alternate arrangements such as a taxi service shall be provided until fully functional shuttle service can be restored.

2.2 Temporary signs shall be placed at all designated stops. The signs shall indicate "Pedestrian/Bicycle Shuttle Stop" and shall conform to 615.

2.3 All other materials necessary to maintain the service.

Construction Requirements

3.1 The shuttle service shall operate from 6 a.m. to midnight during both weekend closure phases of construction. The service shall have a regular schedule and conduct a round trip once every half hour. The schedule shall be posted on the sign at each location.

3.2 A shuttle stop shall be established near the Loudon Road/Stickney Avenue Intersection. The existing Concord Area Transit (CAT) stops along Fort Eddy Road shall be utilized as shuttle stops.

3.3 The service shall operate on a continuous basis with no wait for pedestrians and bicyclists lasting longer than one-half of one hour.

277

3.4 The service shall be free to the public, including those with bicycles.

3.5 The contractor shall maintain required insurances applicable to operate such service as required, and provide a copy to the Engineer.

3.6 The contractor shall pay for and secure all permits and licenses to operate the service for the duration of the contract.

Method of Measurement

4.1 The Temporary Shuttle Service will be measured by the hour, from the hour the service is begun on the project to the hour it is stopped per closure.

Basis of Payment

5.1 The accepted quantity of Temporary Shuttle Service, including signs, will be paid for at the contract unit price per hour. The contract price shall include full compensation for furnishing all labor, materials, signs, equipment, including vans, trailers, operators, tools, and incidentals; and for operating and maintaining the vans and service for the duration indicated or as directed by the Engineer.

Pay items and units:

670.5	Temporary Shuttle Service	Hour
-------	---------------------------	------

278

09/12/07

SUPPLEMENTAL SPECIFICATION

AMENDMENT TO SECTION 698 -- FIELD FACILITIES

Add to 2.2.1:

Rain Gauge: 1, constructed from a clear material, minimum ¼" permanently marked graduations, minimum 6" capacity with mounting bracket.

279

06/27/08

698

SS

1 of 2

Supersedes Dated, 7/20/99, 1/26/00, 7/5/00, 7/21/2000, 8/19/02, 10/02/02, 03/21/03, 05/05/03, 08/18/03, 02/22/05, 03/08/07, and 8/03/07

SUPPLEMENTAL SPECIFICATION

AMENDMENT TO SECTION 698 -- FIELD FACILITIES

Add to 2.2.1:

Computer Equipment and Accessories: The computer system and accessories to be supplied shall be as listed below. The computer system shall be fully operational (all components and software installed) in the field office by representatives of the Contractor, with electronic communication established with the Bureau of Construction in Concord. Except for initial mobilization payment, no contractual payments will be processed until the computer is fully operational.

Minimum Computer Unit:

- 100% IBM Compatible, PCI Bus and Video Architecture.
- Minimum 512 KB Cache RAM
- Clock Speed: Minimum 3.8 GHz. Intel or equivalent
- Memory: 2 GB RAM minimum
- Ports: 1 - Parallel Port, 4 - USB 2.0 Ports
- 10/100 Ethernet adapter
- Keyboard
- Hard Disk: 250 GB minimum
- 17" (16" minimum diagonal view area) Monitor Color SVGA: 1024 X 768 graphics minimum resolution, 0.28 mm dpi or sharper, non-interlaced and 32 bit controller card with 256 MB RAM minimum (non integrated)
- DVD+/-RW drive, must be Windows XP compatible
- Optical mouse with pad and connecting cable

Modem/Communications:

- 56K minimum flex External or Internal Fax Modem, must support v.92 standard
- Unlimited-hours Internet account
- DSL or cable-modem Internet service
- Line spike protector for phone line

Software:

- MS Windows XP, Professional Version
- Microsoft Office 2007, Professional Version
- LapLink Gold 12.0 or higher
- CA AntiVirus Corporate Edition w/update subscription

Printer Unit:

- Laser Jet printer with the following minimum specifications:
 - o Max resolution: 1200 vertical x 1200 horizontal dots of ink per inch

- RAM installed: 32 MB
- 15 sheets per minute print speed
- Microsoft Windows XP compatibility
- Computer disks with software drivers and utilities
- 15 Ft. Long Interface Cable, (Parallel Port)
- Network compatibility (only required if network is to be established per contract)
- Replacement Toner Cartridge(s) as required, with 1 spare on hand at all times.

Wireless Communication:

- Router with the following minimum specifications:
 - Wireless – 802.11b and 802.11g compatible
 - Ports: 4
 - Operating System Compatibility: Microsoft Windows XP, Professional Version

Accessories:

- Digital camera:
 - Minimum 6.0 MegaPixel resolution
 - 12-volt DC adapter and AC adapter power supply cables
 - Carrying case
 - Picture file storage media, compatible for uploading picture data to the computer unit and printer
 - Supports jpeg file format
 - Backup set of rechargeable batteries and charger
- Video Camcorder:
 - New, or used with a recently performed service check verified by an invoice
 - Storage case
 - Instruction book(s)
 - Extra battery with charger
 - Lens protector
 - 30 gb internal hard drive
 - 34x optical zoom
 - Low light capability
 - Image stabilization
 - USB 2.0 interface and cable
- Surge Protector: 15 Amps, six outlets with circuit breaker control and spike protection.
- Plastic dust covers for the computer printer and keyboard.
- Storage Disks: 10 each minimum DVD-RW diskettes with protective covers, as required and a 20 disk capacity storage container.
- Printer Paper: 8-1/2" x 11" cut sheets and 8-1/2" X 14" cut sheets, 2 reams of each type, to be maintained.
- Computer workstation unit: approximately 6 feet long with chair and static guard mats.

04/07/08

Page 1 of 1

Supersedes: 05/06/04

**CONCORD
13742C**

August 19, 2009

SPECIAL PROVISION**AMENDMENT TO SECTION 698 -- FIELD FACILITIES**

The Contractor shall provide **two** cell phones for this project as specified in 2.2.1.

Amend 5.1.2 to read:

5.1.2 For each cell phone/PDA-cell phone provided, the monthly service charge, including taxes, and any activation or deactivation fee for cellular phone or mobile telephone service, including toll calls up to 1000 minutes per month per each, shall be paid by the Contractor and shall be subsidiary. Any call time charges, used by State personnel, above the base 1000 minutes per month will be paid as extra work under Section 104.05.

1/8/91

1002

1 of 2

CONCORD
13742C

August 3, 2009

SPECIAL PROVISION

SECTION 1002 -- SPECIAL WORK ON STRUCTURES

Item 1002.1 - Repairs or Replacements as Needed

Description

1.1 This section is intended to provide and pay for certain measures which may be required, during construction, to rehabilitate existing structures where work by the Contractor has revealed work necessary which could not be examined and foreseen prior to the construction period. Engineering judgment indicates that a reasonable estimated dollar allowance is in order in setting up the contract.

Materials

2.1 Materials required shall meet the Material Requirements for the class or type of work in accordance with the Standard Specifications or as ordered.

Construction Requirements

3.1 The Contractor shall perform the required work as provided in the specification for the required work or as directed.

3.2 Work ordered under this section shall be done in accordance with the pertinent provisions of 104.03.

Method of Measurement

4.1 Work authorized under this section will be measured as provided in 109.01; however when such work falls within the specifications for another contract item, the work will be measured according to the method of measurement for that contract item.

Basis of Payment

5.1 Payment for work authorized under this section will be made on a dollar basis according to 109.04. The dollar limit set in the proposal will not limit the Engineer in the value of work performed under these items.

5.1.1 Payment of the amount set in the proposal will not be on a lump sum basis, but only the amount determined for the value of the work ordered will be paid.

5.1.2 Repair work to damaged or injured portions of a structure made necessary due to the negligence or carelessness of the Contractor will not be paid for.

5.2 The Bidder's attention is called to the price inserted in the proposal under these items, which price is the allowance the department has set up for the special work. This figure must not be altered by the Bidder on the proposal, and must be included to obtain the grand total of the bid.

Pay item and unit:

1002.1	Repairs or Replacements as Needed	Dollar
--------	-----------------------------------	--------

The allowance for Item 1002.1 on this project has been set as \$ 25,000.00.

284

5/2/95

1008

1 of 2

CONCORD
13742C

August 4, 2009

SPECIAL PROVISION

SECTION 1008 -- ALTERATIONS & ADDITIONS AS NEEDED

Item 1008.11 - Alterations And Additions As Needed - Unanticipated Work

This section is intended to provide and pay for certain measures which may be required during construction. Engineering judgment indicates that a reasonable estimated dollar allowance is in order in setting up the contract.

Description

1.1 The Contractor may be required to adjust, relocate, or reconstruct certain items found to be in conflict or infringe on the proposed work.

Materials

2.1 Materials required to adjust or reconstruct structures or facilities encountered in the work shall conform to those designated in the Materials section for the class of work being performed.

Construction Requirements

3.1 The Contractor shall perform all necessary work to relocate, adjust, reconstruct structures or construct items in accordance with the respective classes of work required.

3.2 Damage to facilities due to negligence or careless operation shall be repaired at no extra cost to the Department.

Method of Measurement

4.1 Work authorized under this section will be measured as provided in 109.01; however when such work falls within the specifications for another item in the contract, the work will be measured according to the method of measurement for that contract item.

Basis of Payment

5.1 Payment for work authorized under this section will be made on a dollar basis according to 109.04. The dollar limit set in the proposal will not limit the Engineer in the value of work performed under this item.

5.1.1 Payment of the amount set in the proposal will not be on a lump sum basis, but only the amount determined for the value of the work ordered will be paid.

5.1.2 Repair work to damaged or injured portions of the existing facilities made necessary due to the negligence or carelessness of the Contractor will not be paid for.

5.2 The Bidder's attention is called to the dollar amount inserted in the proposal under these items, which dollar amount is the allowance the department has set up for the special work. This figure must not be altered by the Bidder on the proposal, and must be included to obtain the grand total of the bid.

Pay items and units:

1008.11	Alterations and Additions As Needed - Unanticipated Work	Dollar
---------	--	--------

The allowance for Item 1008.11 on this project has been set as \$ 25,000.00.

286

August 4, 2009

SPECIAL PROVISION

SECTION 1009 – CONTAMINATED SOILS AND GROUNDWATER

Item 1009.11 - Project Health & Safety Plan (Microbial)

This Special Provision is intended to provide and pay for certain measures that may be required in the preparation of a project health and safety plan. Engineering judgment indicates that a reasonable estimated dollar allowance is in order in setting up the contract.

Description

1.1 This work shall consist of developing a site-specific health and safety plan and furnishing equipment and supplies needed to implement the plan when microbial contamination is encountered.

Construction Requirements

3.1 It shall be the responsibility of the Contractor to develop a site-specific health and safety plan and to implement it. The project health and safety plan shall be developed and in-place prior to commencement of demolition activities or work in the suspect areas. The project health and safety plan shall include, but not be limited to, the following:

- 3.1.1** General Information
 - Project Safety Manager and Phone Number
 - Site Location
 - Proposed Action

- 3.1.2** Microbial Contamination
 - Characteristics
 - Primary Hazard

3.1.3 Work Plan Instructions

- Personnel Training
- Perimeter Establishment and On-Site Control
- Personal Protective Equipment
- Communications
- Coordination

3.1.4 Emergency Medical Care Products

- Emergency Phone Numbers
- On-Site First Aid Equipment
- Local Facilities
- Emergency Procedures

3.2 The plan shall be submitted to the Engineer for review for conformance with the project requirements three weeks prior to the start of any demolition/work. No such work shall be performed until the Engineer has indicated that the plan conforms to the requirements (the Contractor is not relieved of any responsibilities under 29 CFR 1926.65(e)).

3.2.1 Work for this project shall be performed in compliance with applicable regulatory standards, including but not limited to, OSHA 29 CFR 1910 Standards for General Industry and OSHA 29 CFR 1926 Standards for the Construction Industry.

3.2.2 The following standards, regulations, and reference documents are incorporated herein by reference and made a part of this specification.

Code of Federal Regulations (CFR) Publications:

- 1) 29 CFR 1926.28 - Personal Protective Equipment.
- 2) 29 CFR 1926.55 - Gases, Vapors, Fumes, Dusts and Mists.
- 3) 29 CFR 1926.57 - Ventilation.
- 4) 29 CFR 1926.59 - Hazard Communication.
- 5) 29 CFR 1926.95 - Criteria for personal protective equipment.
- 6) 29 CFR 1926.96 - Occupational foot protection.
- 7) 29 CFR 1926.100 - Head protection.
- 8) 29 CFR 1926.101 - Hearing protection.
- 9) 29 CFR 1926.102 - Eye and face protection.
- 10) 29 CFR 1926.103 - Respiratory protection.

American National Standard Institute (ANSI) Publications:

- Z9.2-1979 Fundamentals Governing the Design and Operation of Local Exhaust Systems
- Z88.2-1992 Practices for Respiratory Protection

National Fire Protection Association (NFPA):

Standard 90A Installation of Air Conditioning and Ventilation Systems.

Underwriters Laboratories, Inc. (UL) Publications:

586-77 Test Performance of High Efficiency Particulate, Air Filter Units

Reference Documents:

- 1) *Bioaerosols, Their Assessment and Control*. American Conference of Governmental Industrial Hygienists (ACGIH), Cincinnati, Ohio, 1999.
- 2) *Guidelines on Assessment and Remediation of Fungi in Indoor Environments*. New York City Department of Health. Updated April, 2000.
- 3) *Assessment, Cleaning, and Restoration of HVAC Systems ACR 2006*. National Air Duct Cleaners Association, © 2004.
- 4) *A Brief Guide to Mold in the Workplace*, OSHA Bulletin SHIB-03-10-10.

3.3 The Contractor shall maintain all furnished equipment and supplies in good working condition and shall provide replacements due to breakdown, damage, usage, or theft within two (2) working days of notice.

3.3.1 Upon completion of project all equipment and supplies shall remain the property of the Contractor.

3.4 Personnel training shall be in accordance with 29 CFR 1926.65(e) for all personnel conducting, supervising, or managing field work. Cost for training shall be the responsibility of the Contractor.

3.5 Waste from the subject site shall be disposed of as normal construction debris in an appropriate landfill.

Method of Measurement

4.1 Work authorized under this section will be measured as provided in 109.01; however when such work falls within the specifications for another contract item, the work will be measured according to the method of measurement for that contract item.

289

Basis of Payment

5.1 Payment for work authorized under this section will be made on a dollar basis according to 109.04. The dollar limit set in the proposal will not limit the Engineer in the value of work performed under this item.

5.1.1 Payment of the amount set in the proposal will not be on a lump sum basis, but only the amount determined for the value of the work ordered will be paid.

5.2 The Bidder's attention is called to the dollar amount inserted in the proposal under these items, which dollar amount is the allowance the Department has set up for the special work. This figure must not be altered by the Bidder on the proposal, and must be included to obtain the grand total of the bid.

Pay item and unit:

1009.11	Project Health and Safety Plan (Microbial)	Dollar
---------	--	--------

The allowance for Item 1009.1 on this project has been set as \$ 2,000.00

290

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

Proposal of _____

NAME

ADDRESS

to furnish and deliver all materials and to perform all work in accordance with the Contract of the State of New Hampshire, Department of Transportation for the road and bridge rehabilitation on which proposals will be received until 2:00 o'clock P.M., Prevailing Time on the 17th day of September, 2009. Said project being situated as follows:

Bridge No. 163/106 carrying I-93 over Loudon Road at Exit 14

N.H. Department of Transportation
John O. Morton Building
Room 130, Contract Section
P. O. Box 483
Concord, NH 03302-0483

Commissioner:

In accordance with the advertisement of the Department of Transportation inviting proposals for the project hereinbefore named and in conformity with the Plans and Specifications on file in the office of the Department of Transportation, I/WE hereby certify that I AM/WE ARE the only person, or persons, interested in this proposal as principals; that this proposal is made without collusion with any person, firm or corporation; that an examination has been made of the Plans, of the Standard Specifications, of the Standard Plans Book, of the Proposal, and applicable addendums, including but not restricted to the Special Attentions, Supplemental Specifications, and Special Provisions attached thereto, and also that an examination has been made of the site of the work; and I, or we, propose to furnish all necessary machinery, equipment, tools, labor and other means of construction, and to furnish all materials specified in the manner and at the time prescribed; and understand that the quantities of work as shown herein are approximate only and are subject to increase or decrease, and further understand that all quantities of work whether increased or decreased are to be performed at the following prices:

BID SCHEDULE. NOTE: THIS PROPOSAL SHALL BE PREPARED BY THE BIDDER, WITH THE UNIT PRICES SPECIFIED IN BOTH WORDS AND FIGURES, AND THE EXTENSIONS MADE BY THE BIDDER. FOR COMPLETE INFORMATION CONCERNING THESE ITEMS, SEE PLANS, SPECIAL PROVISIONS, AND STANDARD SPECIFICATIONS ADOPTED IN 2006.

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID (F) -FINAL PAY QTY-SEE 109.11	UNIT PRICES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
202.6	4,000.	CURB REMOVAL FOR STORAGE AT _____ _____ DOLLARS PER LF	:	:	:	:
202.7	10,400.	REMOVAL OF GUARDRAIL (F) AT _____ _____ DOLLARS PER LF	:	:	:	:
203.1	4,500.	COMMON EXCAVATION AT _____ _____ DOLLARS PER CY	:	:	:	:
203.2	600.	ROCK EXCAVATION AT _____ _____ DOLLARS PER CY	:	:	:	:
203.5554	3.	GUARDRAIL 50' EAGRT PLATFORM AT _____ _____ DOLLARS PER U	:	:	:	:
209.4	31.	GRANULAR BACKFILL (GRAV) AT _____ _____ DOLLARS PER CY	:	:	:	:

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID (F) - FINAL PAY QTY-SEE 109.11	UNIT PRICES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
214.	1.	FINE GRADING	:	:	:	:
		AT _____	:	:	:	:
	U	_____ DOLLARS PER U	:	:	:	:
304.1	1,100.	SAND (F)	:	:	:	:
		AT _____	:	:	:	:
	CY	_____ DOLLARS PER CY	:	:	:	:
304.32	50.	CRUSHED GRAVEL FOR SHOULDER LEVELING	:	:	:	:
		AT _____	:	:	:	:
	TON	_____ DOLLARS PER TON	:	:	:	:
304.4	1,650.	CRUSHED STONE (FINE GRADATION) (F)	:	:	:	:
		AT _____	:	:	:	:
	CY	_____ DOLLARS PER CY	:	:	:	:
304.5	1,400.	CRUSHED STONE (COARSE GRADATION) (F)	:	:	:	:
		AT _____	:	:	:	:
	CY	_____ DOLLARS PER CY	:	:	:	:
403.11092	5,650.	HOT BITUMINOUS PAVEMENT, MACHINE METHOD (QC/QA TIER 2) (NIGHT)	:	:	:	:
		AT _____	:	:	:	:
	TON	_____ DOLLARS PER TON	:	:	:	:

293

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID (F) - FINAL PAY QTY-SEE 109.11	UNIT PRICES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
403.1199	350. TON	HOT BITUMINOUS PAVEMENT, MACHINE METHOD, HIGH STRENGTH (NIGHT) AT _____ _____ DOLLARS PER TON	:	:	:	:
403.129	110. TON	HOT BITUMINOUS PAVEMENT, HAND METHOD (NIGHT) AT _____ _____ DOLLARS PER TON	:	:	:	:
403.6	29,400. LF	PAVEMENT JOINT ADHESIVE AT _____ _____ DOLLARS PER LF	:	:	:	:
403.911	47. TON	HOT BITUMINOUS BRIDGE PAVEMENT, 1" BASE COURSE (F) AT _____ _____ DOLLARS PER TON	:	:	:	:
403.99	940. TON	TEMPORARY BITUMINOUS PAVEMENT AT _____ _____ DOLLARS PER TON	:	:	:	:
411.19	1,050. TON	HOT BITUMINOUS CONCRETE LEVELING COURSE (NIGHT) AT _____ _____ DOLLARS PER TON	:	:	:	:

294

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID (F) - FINAL PAY QTY-SEE 109.11	UNIT PRICES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
417.19	8,400.	COLD PLANING BITUMINOUS SURFACES (NIGHT) AT _____ _____ DOLLARS PER SY	:	:	:	:
417.52	3,250.	COLD PLANING EXISTING RUMBLE STRIPS, 1" DEPTH AT _____ _____ DOLLARS PER LF	:	:	:	:
502.	1.	REMOVAL OF EXISTING BRIDGE STRUCTURE AT _____ _____ DOLLARS PER U	:	:	:	:
504.1	37.	COMMON BRIDGE EXCAVATION (F) AT _____ _____ DOLLARS PER CY	:	:	:	:
512.0101	50.	PREPARATION FOR CONCRETE REPAIRS, CLASS I AT _____ _____ DOLLARS PER SY	:	:	:	:
512.0201	100.	PREPARATION FOR CONCRETE REPAIRS, CLASS II AT _____ _____ DOLLARS PER SY	:	:	:	:

295

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID (F) -FINAL PAY QTY-SEE 109.11	UNIT PRICES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
520.01	15.	CONCRETE CLASS AA	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER CY	:	:	:	:
520.7006	52.	CONCRETE BRIDGE DECK (HIGH EARLY STRENGTH) (F)	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER CY	:	:	:	:
520.70061	20.	CONCRETE BRIDGE DECK (HIGH EARLY STRENGTH) (ACC. BRIDGE CONST.) (F)	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER CY	:	:	:	:
528.62	6,755.	PRECAST CONCRETE DECK PANELS, POST-TENSIONED (F)	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER SF	:	:	:	:
534.1	20.	WATER REPELLENT (LINSEED OIL)	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER GAL	:	:	:	:
534.3	20.	WATER REPELLENT (SILANE/SILOXANE)	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER GAL	:	:	:	:

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID (F) -FINAL PAY QTY-SEE 109.11	UNIT PRICES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
538.2	77.	BARRIER MEMBRANE, VERTICAL SURFACES (F)	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER SY	:	:	:	:
538.6	765.	BARRIER MEMBRANE, WELDED BY TORCH, MACHINE METHOD (F)	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER SY	:	:	:	:
541.5	83.	PVC WATERSTOPS, NH TYPE 5 (F)	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER LF	:	:	:	:
544.2	10,914.	REINFORCING STEEL, EPOXY COATED (F)	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER LB	:	:	:	:
547.	3,168.	SHEAR CONNECTORS (F)	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER EA	:	:	:	:
548.21	12.	ELASTOMERIC BEARING ASSEMBLIES (F)	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER EA	:	:	:	:

297

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID (F) - FINAL PAY QTY-SEE 109.11	UNIT PRICES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
550.191	1.	TEMPORARY GIRDER SUPPORT SYSTEM	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER U	:	:	:	:
	U		:	:	:	:
556.101	1.	PAINTING EXISTING STRUCTURAL STEEL	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER U	:	:	:	:
	U		:	:	:	:
556.201	1.	CONTAINMENT AND ENVIRONMENTAL PROTECTION	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER U	:	:	:	:
	U		:	:	:	:
556.301	1.	WORKER PROTECTION	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER U	:	:	:	:
	U		:	:	:	:
556.401	1.	WASTE MANAGEMENT	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER U	:	:	:	:
	U		:	:	:	:
560.1	86.	PREFABRICATED COMPRESSION SEAL EXPANSION JOINT (F)	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER LF	:	:	:	:
	LF		:	:	:	:

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID (F) -FINAL PAY QTY-SEE 109.11	UNIT PRICES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
562.1	30.	SILICONE JOINT SEALANT (F)	:	:	:	:
		AT _____	:	:	:	:
	LF	_____ DOLLARS PER LF	:	:	:	:
563.223	320.	BRIDGE RAIL T2 WITH SNOW SCREENING (F)	:	:	:	:
		AT _____	:	:	:	:
	LF	_____ DOLLARS PER LF	:	:	:	:
565.222	117.	BRIDGE APPROACH RAIL, T2 (STEEL POSTS) (F)	:	:	:	:
		AT _____	:	:	:	:
	LF	_____ DOLLARS PER LF	:	:	:	:
603.00215	78.	15" R.C. PIPE, 2000D	:	:	:	:
		AT _____	:	:	:	:
	LF	_____ DOLLARS PER LF	:	:	:	:
604.0007	54.	POLYETHYLENE LINER	:	:	:	:
		AT _____	:	:	:	:
	EA	_____ DOLLARS PER EA	:	:	:	:
604.12	13.	CATCH BASINS TYPE B	:	:	:	:
		AT _____	:	:	:	:
	U	_____ DOLLARS PER U	:	:	:	:



ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID (F) - FINAL PAY QTY-SEE 109.11	UNIT PRICES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
604.4	41.	RECONSTRUCTING/ADJUSTING CATCH BASIN & DROP INLET	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER LF	:	:	:	:
	LF		:	:	:	:
606.120	4,950.	BEAM GUARDRAIL (STANDARD SECTION-STEEL POST)	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER LF	:	:	:	:
	LF		:	:	:	:
606.1454	3.	BEAM GUARDRAIL (TERM. UNIT TYPE EAGRT 50 FT.)	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER U	:	:	:	:
	U		:	:	:	:
606.147	4.	BEAM GUARDRAIL (TERMINAL UNIT TYPE G-2)	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER U	:	:	:	:
	U		:	:	:	:
606.21203	8,000.	DOUBLE-FACED BEAM GUARDRAIL (GALVANIZED) THRIE BEAM (STEEL POST)	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER LF	:	:	:	:
	LF		:	:	:	:
606.3223	5.	DOUBLE FACED TRANSITION RAIL TO THRIE BEAM, STEEL POST	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER U	:	:	:	:
	U		:	:	:	:

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID (F) -FINAL PAY QTY-SEE 109.11	UNIT PRICES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
606.402	200.	CONCRETE BARRIER, DOUBLE-FACED AT _____ _____ DOLLARS PER LF	:	:	:	:
606.41231	5.	TRANSITION SINGLE SLOPE CONCRETE BARRIER, PRECAST INCLUDE. TRANS. SECTION AT _____ _____ DOLLARS PER U	:	:	:	:
606.417	3,000.	PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL AT _____ _____ DOLLARS PER LF	:	:	:	:
606.4175	200.	PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL - ANCHORED AT _____ _____ DOLLARS PER LF	:	:	:	:
606.9523	1.	TEMP. IMPACT ATTENUATION DEVICE (NON-REDIRECTIVE), TEST LEVEL 3 AT _____ _____ DOLLARS PER U	:	:	:	:
609.01	130.	STRAIGHT GRANITE CURB AT _____ _____ DOLLARS PER LF	:	:	:	:

301

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID (F) -FINAL PAY QTY-SEE 109.11	UNIT PRICES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
609.5	2,150.	RESET GRANITE CURB	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS	:	:	:	:
	LF	PER LF	:	:	:	:
609.811	3,200.	BITUMINOUS CURB, TYPE B (4" REVEAL)	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS	:	:	:	:
	LF	PER LF	:	:	:	:
615.04	370.	TRAFFIC SIGN TYPE AA (F)	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS	:	:	:	:
	SF	PER SF	:	:	:	:
615.30001	1.	BRIDGE MOUNTED TRAFFIC SIGN STRUCTURE	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS	:	:	:	:
	U	PER U	:	:	:	:
615.30002	1.	BRIDGE MOUNTED TRAFFIC SIGN STRUCTURE	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS	:	:	:	:
	U	PER U	:	:	:	:
615.30003	1.	BRIDGE MOUNTED TRAFFIC SIGN STRUCTURE	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS	:	:	:	:
	U	PER U	:	:	:	:

302

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID (F)-FINAL PAY QTY-SEE 109.11	UNIT PRICES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
615.30004	1.	BRIDGE MOUNTED TRAFFIC SIGN STRUCTURE	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER U	:	:	:	:
	U		:	:	:	:
616.161	1.	TRAFFIC SIGNALS (TEMP.)	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER U	:	:	:	:
	U		:	:	:	:
616.162	1.	TRAFFIC SIGNALS (TEMP.)	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER U	:	:	:	:
	U		:	:	:	:
616.191	1.	ALTERATIONS TO TRAFFIC SIGNALS	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER U	:	:	:	:
	U		:	:	:	:
616.451	2.	TRAFFIC SIGNALS REMOVAL AND REINSTALLATION	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER U	:	:	:	:
	U		:	:	:	:
616.650	4.	TRAFFIC SIGNAL DETECTOR LOOP 6 FT X 50 FT	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS PER EA	:	:	:	:
	EA		:	:	:	:

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID (F)-FINAL PAY QTY-SEE 109.11	UNIT PRICES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
618.61		UNIFORMED OFFICERS WITH VEHICLE	:	:	\$50,500:00	:
618.7	500.	FLAGGERS	:	:	:	:
	HR	AT _____ _____ DOLLARS PER HR	:	:	:	:
619.1	1.	MAINTENANCE OF TRAFFIC	:	:	:	:
	U	AT _____ _____ DOLLARS PER U	:	:	:	:
619.253	44.	PORTABLE CHANGEABLE MESSAGE SIGN (UNIT WEEK)	:	:	:	:
	UWK	AT _____ _____ DOLLARS PER UWK	:	:	:	:
619.27	2.	TRAILER-MOUNTED SPEED LIMIT SIGN	:	:	:	:
	U	AT _____ _____ DOLLARS PER U	:	:	:	:
619.63	2.	TRUCK-MOUNTED IMPACT ATTENUATOR, TEST LEVEL 3	:	:	:	:
	EA	AT _____ _____ DOLLARS PER EA	:	:	:	:

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID (F) -FINAL PAY QTY-SEE 109.11	UNIT PRICES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
621.1	15.	RETROREFLECTIVE MEDIAN BARRIER DELINEATOR AT _____ _____ DOLLARS PER EA	:	:	:	:
621.2	235.	RETROREFLECTIVE BEAM GUARDRAIL DELINEATOR AT _____ _____ DOLLARS PER EA	:	:	:	:
628.2	760.	SAWED BITUMINOUS PAVEMENT AT _____ _____ DOLLARS PER LF	:	:	:	:
632.0106	40,400.	RETROREFLECTIVE PAINT PAVE. MARKING, 6" LINE AT _____ _____ DOLLARS PER LF	:	:	:	:
632.0112	3,200.	RETROREFLECTIVE PAINT PAVE. MARKING, 12" LINE AT _____ _____ DOLLARS PER LF	:	:	:	:
632.1106	43,900.	PREFORMED RETROREFLECTIVE TAPE, TYPE I (REMOVABLE) 6" LINE AT _____ _____ DOLLARS PER LF	:	:	:	:

305

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID (F)-FINAL PAY QTY-SEE 109.11	UNIT PRICES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
632.3118	58.	RETROREFLECT. THERMOPLAS. PAVE. MARKING, 18" LINE	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS	:	:	:	:
	LF	PER LF	:	:	:	:
632.32	320.	RETROREFLECT. THERMOPLAS. PAVEMENT MARKING, SYMBOL OR WORD	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS	:	:	:	:
	SF	PER SF	:	:	:	:
643.21	27.	FERTILIZER FOR REFERTIL- IZATION	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS	:	:	:	:
	LB	PER LB	:	:	:	:
645.531	200.	SILT FENCE	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS	:	:	:	:
	LF	PER LF	:	:	:	:
645.7	1.	STORM WATER POLLUTION PREVENTION PLAN	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS	:	:	:	:
	U	PER U	:	:	:	:
645.71	100.	MONITORING SWPPP AND EROSION AND SEDIMENT CONTROLS	:	:	:	:
		AT _____	:	:	:	:
		_____ DOLLARS	:	:	:	:
	HR	PER HR	:	:	:	:

306

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID (F) - FINAL PAY QTY-SEE 109.11	UNIT PRICES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
646.31	150.	TURF ESTABLISHMENT WITH MULCH AND TACKIFIERS AT _____ _____ DOLLARS PER SY	:	:	:	:
647.1	15.	HUMUS AT _____ _____ DOLLARS PER CY	:	:	:	:
670.045	1.	CONSTRUCT AND REMOVE TEMPORARY DETOUR AT _____ _____ DOLLARS PER U	:	:	:	:
670.104	2.	TEMPORARY LIGHTING (PORTABLE) AT _____ _____ DOLLARS PER U	:	:	:	:
670.5	82.	TEMPORARY SHUTTLE SERVICE AT _____ _____ DOLLARS PER HR	:	:	:	:
692.	1.	MOBILIZATION AT _____ _____ DOLLARS PER U	:	:	:	:

307

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID (F)-FINAL PAY QTY-SEE 109.11	UNIT PRICES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
698.12	7. MON	FIELD OFFICE TYPE B AT _____ _____ DOLLARS PER MON	:	:	:	:
698.2	7. MON	PHYSICAL TESTING LABORATORY AT _____ _____ DOLLARS PER MON	:	:	:	:
699.		MISCELLANEOUS TEMPORARY EROSION AND SEDIMENT CONTROL	:	:	\$3,000:00	:
1002.1		REPAIRS OR REPLACEMENTS AS NEEDED	:	:	\$25,000:00	:
1008.11		ALTERATIONS AND ADDITIONS AS NEEDED- UNANTICIPATED WORK	:	:	\$25,000:00	:
1009.11		HEALTH AND SAFETY PLAN (MICROBIAL)	:	:	\$2,000:00	:

ITEM NOS.	APPROXIMATE QUANTITIES	ITEMS AND UNIT PRICES BID (F) - FINAL PAY QTY-SEE 109.11	UNIT PRICES		AMOUNT	
			DOLLARS	CENTS	DOLLARS	CENTS
1010.15		FUEL ADJUSTMENT	:	:	\$40,000	:00
1010.2		ASPHALT CEMENT ADJUSTMENT	:	:	\$10,000	:00
1010.3		QUALITY CONTROL QUALITY ASSURANCE (QC/QA) ASPHALT	:	:	\$21,000	:00
1010.5		COMPLETION INCENTIVE/ DISINCENTIVE	:	:	\$300,000	:00

GRAND TOTAL \$ _____ *

* NOTE: GRAND TOTAL SHOULD ALSO BE ENTERED ON PROPOSAL COVER

309



Rev: December 22, 1998

It is further proposed:

To execute the Contract and begin work within 10 days from the date specified in the "Notice to Proceed" and to prosecute said work so as to complete the Roadway Bridge Project and its appurtenances on or before October 15, 2010.

To furnish a Contract Bond in the amount of 100 per cent of the Contract award, as security for the construction and completion of the Roadway Bridge Project and its appurtenances in accordance with the Plans, Specifications and Contract. The Contractor's attention is called to section 103.05 of the Standard Specifications which reads, in part, as follows: "Unless specifically waived in the Proposal, upon execution of the Contract, the successful Bidder shall furnish the Department a surety bond or bonds equal to the sum of the Contract amount. The form of the bond(s) shall be acceptable to the Department and the bonding Company issuing the bond(s) shall be licensed to transact business in the State of New Hampshire, and ..."

To guarantee all of the work performed under this Contract to be done in accordance with the Specifications and in good and workmanlike manner, and to renew or repair any work which may be rejected, due to defective materials or workmanship, prior to final completion and acceptance of the project.

Enclosed herewith find certified check or bid bond in the amount of Fifty Thousand Dollars and No Cents dollars (\$50,000.00), made payable to the "Treasurer, State of New Hampshire," as a proposal guarantee which it is understood will be forfeited in the event the Contract is not executed, if awarded by the Department to the undersigned.

Dated: _____

(If a firm or individual)

Signature of Bidder _____

By _____

Address of Bidder _____

Names and addresses of members of the Firm:

(If a Corporation)

Signature of Bidder _____

Title _____

By _____

Business Address _____

Incorporated under the laws of the State of _____

Names of Officers:

President	_____	_____
	Name	Address
Secretary	_____	_____
	Name	Address
Treasurer	_____	_____
	Name	Address

Note: See Subsection 102.07 for signature requirements.

310

