



**STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION**



**2800 BERLIN TURNPIKE, P.O. BOX 317546
NEWINGTON, CONNECTICUT 06131-7546**

Phone: 860-594-3128

November 8, 2016

Subject: FAP No. 0015(134)

Project No.158-211: Route 15 Safety Improvements, Resurfacing, Enhancements and Bridges Improvements in the Towns of Westport & Fairfield.

Project No.158-207: Rehabilitation of Bridge No. 00728 Merritt Parkway over the Saugtuck River in the Town of Westport.

NOTICE TO CONTRACTORS:

This is to notify all concerned and especially the prospective bidders that the bid opening for the subject project has been previously postponed Two (2) additional weeks from November 2, 2016 to November 16, 2016 at 2:00 P.M. in the Conference Room of the Department of Transportation Administration Building, 2800 Berlin Turnpike, Newington, Connecticut.

Addendum No. 1 is attached

Please send all future questions to <http://dot-contractsqanda.ct.gov/Default.aspx>

Philip J. Melchionne

For: Gregory D. Straka
Contracts Manager
Division of Contracts Administration

NOVEMBER 7, 2016
MERRITT PARKWAY (ROUTE 15) SAFETY IMPROVEMENTS,
RESURFACING, ENHANCEMENTS, AND BRIDGE IMPROVEMENTS
FEDERAL AID PROJECT NOS.: 0015(134) & N/A
STATE PROJECT NOS.: 158-211 & 158-207
TOWNS OF WESTPORT & FAIRFIELD

ADDENDUM NO. 1

This Addendum addresses the following questions and answers contained on the “CT DOT QUESTIONS AND ANSWERS WEBSITE FOR ADVERTISED CONSTRUCTION PROJECTS”:

Question and Answer Nos. 3, 4, 7, 13, 17, 18, 19, 20, 21, 22, 23, 30

SPECIAL PROVISIONS

NEW SPECIAL PROVISIONS

The following Special Provisions are hereby added to the Contract:

- NTC – ELECTRONIC ENGINEERING DATA (EED)
- NTC – COORDINATION OF MPT WITH OTHER PROJECTS
- ITEM NO. 0406163A – HIGH FRICTION SURFACE TREATMENT
- ITEM NO. 0511006A – CLEANING WEEPHOLES
- ITEM NO. 0511204A – EXTEND EXISTING WEEPHOLES
- ITEM NO. 0520907A – REPLACE JOINT SEAL
- ITEM NO. 0522129A – CLEAN AND LUBRICATE EXISTING BEARINGS
- ITEM NO. 0602980A – CLEAN AND COAT EXPOSED REINFORCING STEEL
- ITEM NO. 0603748A – SPECIAL PAINTING TREATMENT
- ITEM NO. 0603926A – ABRASIVE BLAST CLEANING AND FIELD PAINTING OF STRUCTURE (SITE NO. 3)
- ITEM NO. 0973725A – WORKSITE TRAFFIC SUPERVISOR (MINIMUM BID)

REVISED SPECIAL PROVISIONS

The following Special Provisions are hereby deleted in their entirety and replaced with the attached like-named Special Provisions:

- CONTRACT TIME AND LIQUIDATED DAMAGES
- NTC – BRIDGE INSPECTION REPORTS
- SECTION 1.08 – PROSECUTION AND PROGRESS
- ITEM NO. 0020904A – LEAD COMPLIANCE FOR ABRASIVE BLAST CLEANING

- ITEM NO. 0503253A – CLEAN HISTORIC CONCRETE BRIDGE (SITE NO. 4)
 - ITEM NO. 0503254A – CLEAN HISTORIC CONCRETE BRIDGE (SITE NO. 5)
 - ITEM NO. 0503255A – CLEAN HISTORIC CONCRETE BRIDGE (SITE NO. 6)
 - ITEM NO. 0503259A – CLEAN HISTORIC CONCRETE BRIDGE (SITE NO. 9)
 - ITEM NO. 0503268A – CLEAN HISTORIC CONCRETE BRIDGE (SITE NO. 10)
- [This Special Provision is revised only by the deletion of Item No. 0503252A - Clean Historic Concrete Bridge (Site No. 3)]
- ITEM NO. 0503307A – RESTORATION OF METAL FEATURES
 - ITEM NO. 0520041A – PREFORMED JOINT SEAL
 - ITEM NO. 0603858A – REHABILITATION OF EXISTING STRUCTURAL STEEL
 - ITEM NO. 0605008A – ARCHITECTURAL TILES
 - ITEM NO. 0707009A – MEMBRANE WATERPROOFING (COLD LIQUID ELASTOMER)
 - ITEM NO. 0904500A – METAL BRIDGE RAIL (ORNAMENTAL GRILLE)
 - ITEM NO. 0971001A – MAINTENANCE AND PROTECTION OF TRAFFIC
 - ITEM NO. 1204121A – INSTALL STATE FURNISHED SIGN FACE SHEET ALUMINUM (LARGE SIGNS)

DELETED SPECIAL PROVISIONS

The following Special Provisions are hereby deleted in their entirety:

- NTC – LEAD BASED PAINT INVESTIGATION
- ITEM NO. 0603973A – HRCSA CORROSION PROTECTION SYSTEM
- ITEM NO. 0714050A – TEMPORARY EARTH RETAINING SYSTEM

CONTRACT ITEMS

NEW CONTRACT ITEMS

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>UNIT</u>	<u>QUANTITY</u>
<u>0406163A</u>	<u>HIGH FRICTION SURFACE TREATMENT</u>	<u>S.Y.</u>	<u>6558</u>
<u>0511006A</u>	<u>CLEANING WEEPHOLES</u>	<u>EA.</u>	<u>24</u>
<u>0511204A</u>	<u>EXTEND EXISTING WEEPHOLES</u>	<u>EA.</u>	<u>6</u>
<u>0520907A</u>	<u>REPLACE JOINT SEAL</u>	<u>L.F.</u>	<u>130</u>
<u>0522129A</u>	<u>CLEAN AND LUBRICATE EXISTING BEARINGS</u>	<u>EA.</u>	<u>14</u>
<u>0602980A</u>	<u>CLEAN AND COAT EXPOSED REINFORCING STEEL</u>	<u>L.F.</u>	<u>200</u>
<u>0603748A</u>	<u>SPECIAL PAINTING TREATMENT</u>	<u>L.S.</u>	<u>1</u>
<u>0603926A</u>	<u>ABRASIVE BLAST CLEANING AND FIELD PAINTING OF STRUCTURE (SITE NO.3)</u>	<u>L.S.</u>	<u>1</u>

<u>0755014</u>	<u>GEOTEXTILE (SEPARATION – HIGH SURVIVABILITY)</u>	<u>S.Y.</u>	<u>85</u>
<u>0910400</u>	<u>CONVERT METAL BEAM RAIL (TYPE R-I TO TYPE R-I SYSTEM 2)</u>	<u>L.F.</u>	<u>214</u>
<u>0910401</u>	<u>CONVERT METAL BEAM RAIL (TYPE R-I TO TYPE R-I SYSTEM 3)</u>	<u>L.F.</u>	<u>100</u>
<u>0950033</u>	<u>EROSION CONTROL MATTING TYPE H</u>	<u>S.Y</u>	<u>703</u>
<u>0973725A</u>	<u>WORKSITE TRAFFIC SUPERVISOR (MINIMUM BID)</u>	<u>L.S.</u>	<u>1</u>

REVISED CONTRACT ITEMS

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>ORIGINAL QUANTITY</u>	<u>REVISED QUANTITY</u>
<u>0202000</u>	<u>EARTH EXCAVATION</u>	<u>46760</u>	<u>46920</u>
<u>0202529</u>	<u>CUT BITUMINOUS CONCRETE PAVEMENT</u>	<u>64528</u>	<u>64328</u>
<u>0209001</u>	<u>FORMATION OF SUBGRADE</u>	<u>46375</u>	<u>46675</u>
<u>0406159</u>	<u>PMA S0.5</u>	<u>23120</u>	<u>23318</u>
<u>0406171</u>	<u>HMA S0.5</u>	<u>19910</u>	<u>19712</u>
<u>0601201A</u>	<u>CLASS “F” CONCRETE</u>	<u>82</u>	<u>121</u>
<u>0601423A</u>	<u>CLASS “C” CONCRETE – REPLICATED</u>	<u>285</u>	<u>221</u>
<u>0602000</u>	<u>DEFORMED STEEL BARS</u>	<u>55567</u>	<u>64200</u>
<u>0602910A</u>	<u>DRILLING HOLES AND GROUTING DOWELS</u>	<u>6922</u>	<u>6360</u>
<u>0603858A</u>	<u>REHABILITATION OF EXISTING STRUCTURAL STEEL</u>	<u>420</u>	<u>375</u>
<u>0703012</u>	<u>MODIFIED RIPRAP</u>	<u>707</u>	<u>355</u>
<u>0813451</u>	<u>GRANITE STONE TRANSITION CURBING</u>	<u>655</u>	<u>735</u>
<u>0821013A</u>	<u>MERRITT PARKWAY MEDIAN MARRIER (BRIDGE)</u>	<u>431</u>	<u>461</u>
<u>0822001</u>	<u>TEMPORARY PRECAST CONCRETE BARRIER CURB</u>	<u>35158</u>	<u>34878</u>
<u>0822002A</u>	<u>RELOCATED TEMPORARY PRECAST CONCRETE BARRIER CURB</u>	<u>95440</u>	<u>95180</u>
<u>0822005A</u>	<u>TEMPORARY PRECAST CONCRETE BARRIER CURB (STRUCTURE)</u>	<u>254</u>	<u>508</u>
<u>0822006A</u>	<u>RELOCATED TEMPORARY PRECAST CONCRETE BARRIER CURB (STRUCTURE)</u>	<u>1520</u>	<u>1267</u>

<u>0904050A</u>	<u>TWO-TUBE RETROFIT RAIL</u>	<u>1654</u>	<u>1358</u>
<u>0910173</u>	<u>R-B 350 BRIDGE ATTACHMENT – VERTICAL SHAPED PARAPET</u>	<u>2</u>	<u>6</u>
<u>0974052A</u>	<u>REMOVAL OF EXISTING MASONRY – LIMITED METHODS</u>	<u>132</u>	<u>116</u>
<u>1807012</u>	<u>TEMPORARY IMPACT ATTENUATION SYSTEM TYPE A MODULE 700 LB</u>	<u>16</u>	<u>14</u>
<u>1807013</u>	<u>TEMPORARY IMPACT ATTENUATION SYSTEM TYPE A MODULE 1400 LB</u>	<u>48</u>	<u>40</u>
<u>1807014</u>	<u>TEMPORARY IMPACT ATTENUATION SYSTEM TYPE A MODULE 2100 LB</u>	<u>24</u>	<u>20</u>
<u>1807101</u>	<u>RELOCATION OF TEMPORARY IMPACT ATTENUATION SYSTEM TYPE A</u>	<u>15</u>	<u>13</u>

DELETED CONTRACT ITEMS

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>ORIGINAL QUANTITY</u>	<u>REVISED QUANTITY</u>
<u>0503252A</u>	<u>CLEAN HISTORIC CONCRETE BRIDGE (SITE NO.3)</u>	<u>1</u>	<u>0</u>
<u>0602006</u>	<u>DEFORMED STEEL BARS - EPOXY COATED</u>	<u>12,900</u>	<u>0</u>
<u>0603973A</u>	<u>HRCSA CORROSION PROTECTION SYSTEM</u>	<u>1</u>	<u>0</u>
<u>0714050A</u>	<u>TEMPORARY EARTH RETAINING SYSTEM</u>	<u>400</u>	<u>0</u>
<u>0755010</u>	<u>GEOTEXTILE SEPARATION (MEDIUM SEPARABILITY)</u>	<u>703</u>	<u>0</u>
<u>0910168</u>	<u>CONVERT METAL BEAM RAIL (TYPE R-B TO TYPE R-B 350)</u>	<u>80</u>	<u>0</u>
<u>0910190</u>	<u>CONVERT METAL BEAM RAIL (TYPE R-I TO TYPE R-B 350)</u>	<u>1</u>	<u>0</u>

PLANS

NEW PLANS

The following Plan Sheets are hereby added to the Contract:

01.03.24.A1, 01.03.25.A1, 01.03.26.A1, 01.03.27.A1, 01.03.28.A1, 03.01.02-1.A1,
03.01.06-1.A1, 05.03.35-1.A1, SUBSET 05.05 - ORIGINAL PLAN_A01

REVISED PLANS

The following Plan Sheets are hereby deleted and replaced with the like-numbered Plan Sheets appended with A1:

01.02.01.A1, 01.03.02.A1, 01.03.03.A1, 01.03.04.A1, 01.03.05.A1, 01.03.06.A1, 01.03.07.A1, 01.03.13.A1, 01.03.14.A1, 01.03.15.A1, 01.03.16.A1, 01.03.17.A1, 01.03.19.A1, 01.04.40.A1, 02.01.41.A1, 02.01.42.A1, 02.01.47.A1, 02.01.48.A1, 02.01.49.A1, 03.01.06.A1, 05.01.01.A1, 05.02.01.A1, 05.03.02.A1, 05.03.04.A1, 05.03.05.A1, 05.03.06.A1, 05.03.07.A1, 05.03.08.A1, 05.03.09.A1, 05.03.10.A1, 05.03.11.A1, 05.03.13.A1, 05.03.14.A1, 05.03.15.A1, 05.03.16.A1, 05.03.17.A1, 05.03.18.A1, 05.03.21.A1, 05.03.22.A1, 05.03.23.A1, 05.03.24.A1, 05.03.25.A1, 05.03.26.A1, 05.03.27.A1, 05.03.28.A1, 05.03.29.A1, 05.03.30.A1, 05.03.31.A1, 05.03.32.A1, 05.03.33.A1, 05.03.34.A1, 05.03.35.A1, 05.03.36.A1, 05.03.37.A1, 05.03.38.A1, 05.03.39.A1

DELETED PLANS

The following Plan Sheets are hereby deleted in their entirety:

01.03.18, 02.01.43, 02.01.44, 02.01.45, 02.01.46

The Detailed Estimate Sheets do not reflect these changes.

The Bid Proposal Form has been revised to reflect these changes.

There will be no change in the number of calendar days due to this Addendum.

The foregoing is hereby made a part of the contract.

CONTRACT TIME AND LIQUIDATED DAMAGES

In order to minimize the hazard, cost and inconvenience to the traveling public, pollution of the environment and the detriment to the business area, it is necessary to limit the time of construction work, which interferes with traffic as specified in Article 1.08.04 of the Special Provisions.

There will be two assessments for liquidated damages and they will be addressed in the following manner:

1. For this contract, an assessment per day for liquidated damages, at a rate of Nine Thousand Two Hundred Dollars (\$9,200.00) per day shall be applied to each calendar day the work runs in excess of the Six Hundred Thirty (630) allowed calendar days for the contract.
2. For this contract, an assessment per hour for liquidated damages shall be applied to each hour, or any portion thereof, in which the Contractor interferes with normal traffic operations during the restricted hours given in Article 1.08.04 of the Special Provisions. The liquidated damages shall be as shown in the following tables entitled "Liquidated Damages Per Hour" for each hour, or any portion thereof, in which the Contractor interferes with normal traffic operations during the restricted hours.

For the purpose of administering this contract, normal traffic operations are considered interfered with when:

1. Any portion of the travel lanes or shoulders is occupied by any personnel, equipment, materials, or supplies including signs.
2. The transition between the planes of pavement surfaces is at a rate of one inch in less than fifteen feet longitudinally.

LIQUIDATED DAMAGES PER HOUR

Project Nos. 158-211 & 158-207

Route 15 N.B. From M.P. 20.24 (Southern project limit) to M.P. 20.73 2 Lane Section		
If Working Periods Extends Into	A.M. 1 Lane Closure	P.M. 1 Lane Closure
1st Hour of Restrictive Period	\$ 500	\$ 15,000
2nd Hour of Restrictive Period	\$ 500	\$ 50,000
3rd Hour or any Subsequent Hour of Restrictive Period	\$ 500	\$ 80,000

Route 15 N.B. From M.P. 20.73 to M.P. 25.22 (Northern project limit) 2 Lane Section		
If Working Periods Extends Into	A.M. 1 Lane Closure	P.M. 1 Lane Closure
1st Hour of Restrictive Period	\$ 500	\$ 10,000
2nd Hour of Restrictive Period	\$ 1,000	\$ 50,000
3rd Hour or any Subsequent Hour of Restrictive Period	\$ 5,000	\$ 80,000

The above liquidated damages apply to those hours shown on the Limitation of Operations charts designated with a “2” or “E”.

For each hour shown on the Limitation of Operations charts designated with an “E”, liquidated damages of \$500 shall apply for each hour, or part thereof, if all available shoulder widths are not available to traffic.

Liquidated damages in the amount of \$500 shall apply for each hour, or part thereof, that the Contractor interferes with existing traffic operations on any ramps or turning roadways during the non-allowable hours.

GENERAL

LIQUIDATED DAMAGES PER HOUR

Project Nos. 158-211 & 158-207

Route 15 S.B. From M.P. 20.24 (Southern project limit) to M.P. 20.73 2 Lane Section		
If Working Periods Extends Into	A.M. 1 Lane Closure	P.M. 1 Lane Closure
1st Hour of Restrictive Period	\$ 35,000	\$ 500
2nd Hour of Restrictive Period	\$ 70,000	\$ 500
3rd Hour or any Subsequent Hour of Restrictive Period	\$ 80,000	\$ 1,000

Route 15 S.B. From M.P. 20.73 to M.P. 25.22 (Northern project limit) 2 Lane Section		
If Working Periods Extends Into	A.M. 1 Lane Closure	P.M. 1 Lane Closure
1st Hour of Restrictive Period	\$ 10,000	\$ 500
2nd Hour of Restrictive Period	\$ 30,000	\$ 500
3rd Hour or any Subsequent Hour of Restrictive Period	\$ 45,000	\$ 6,000

The above liquidated damages apply to those hours shown on the Limitation of Operations charts designated with a “2” or “E”.

For each hour shown on the Limitation of Operations charts designated with an “E”, liquidated damages of \$500 shall apply for each hour, or part thereof, if all available shoulder widths are not available to traffic.

Liquidated damages in the amount of \$500 shall apply for each hour, or part thereof, that the Contractor interferes with existing traffic operations on any ramps or turning roadways during the non-allowable hours.

GENERAL

NOTICE TO CONTRACTOR - ELECTRONIC ENGINEERING DATA (EED)

The EED is an assembly of engineering data files that were used to produce the contract plans.

Electronic Engineering Data (EED) is provided for information purposes only. In case of conflict between the EED and the contract plans and specifications, the contract plans and specifications shall govern. The EED has been reviewed by the Department for quality control purposes, but it is the Contractor's responsibility to build the project per the contract plans and specifications.

The EED is being provided to the Engineer for GPS/RTS inspection. The Contractor may use the EED to assist in layout and Automated Machine Control/Guidance.

The EED includes geospatially correct 2D CAD files, and horizontal and vertical alignment data files. There are two formats being provided:

- Native Format
 - Bentley MicroStation CAD files (dgn)
 - Bentley SS2 InRoads Alignment Files (alg)
- Converted Format (for use in GPS site equipment)
 - AutoCAD CAD files (dxf)
 - Alignment files (xml)

For a complete list of EED files see EED file manifest (PDF) located in the EED_0158-0211.zip file which is posted with the contract PS&E's on the State Contracting portal.

NOTICE TO CONTRACTOR - BRIDGE INSPECTION REPORTS

The Contractor is hereby notified that the most recent Bridge Inspection Reports for the eleven bridges of this project as developed by the Department's Office of Bridge Safety and Evaluation (BSE) will be available on the Department's "Projectwise" at the following link:

<pw:\\ctdot.projectwiseonline.com:CTDOT\Documents\02.0 - Asset - Bridges>

The information provided in these reports is based upon only the specific locations indicated; and the Department gives no assurance that the conditions discovered are typical or that those conditions will have remained unchanged since the field data were obtained.

The Contractor shall be solely responsible for all assumptions, deductions, or conclusions it may make or derive from its examination of these reports. In furnishing or making available such information, the Department makes no warranty or representation as to the actual conditions that may be encountered or actual quantities or distribution of quantities of work that will be required in the course of the Project.

NOTICE TO CONTRACTOR - COORDINATION OF MPT WITH OTHER PROJECTS

The Contractor is hereby notified that he shall provide the services of the project MPT Supervisor and MPT Coordinator as required under Item # 0973725A – Worksite Traffic Supervisor (Minimum Bid). The MPT Supervisor and MPT Coordinator will be required to attend scheduled MPT coordination meetings with the Department, adjacent and other Fairfield County Area Projects along I-95, Route 7, Route 1, and Route 15, including Maintenance Operations, and other parties as indicated herein and as deemed necessary.

On every Wednesday prior to the close of business, the Contractor shall submit to the Engineer, to be transmitted to the Department, a two-week “Traffic Control Look-Ahead Report/Schedule” that details the Contractor’s proposed use of traffic control signing patterns for the temporary lane and/or shoulder closures, temporary traffic shifts, and temporary detours to complete construction operations. The “Traffic Control Look-Ahead Report” shall be designed and used by the Contractor. The actual traffic shifts, lane closures, etc. shall be coordinated with other projects, including Maintenance Operations, and activities such that conflicts and impacts with operations are minimized prior to submission of the Look-Ahead Report.

In addition, the Contractor shall review and fully comply with “Section 1.05.07 – Coordination with Work by Other Parties” and the special provision for “Section 1.08.04 – Limitations of Contractor Operations” located elsewhere within this Contract.

SECTION 1.08 - PROSECUTION AND PROGRESS

Article 1.08.03 - Prosecution of Work:

Add the following:

The Contractor shall notify the Traffic Signal Lab at Telephone (860) 258-0346 or (860) 258-0349 forty-five (45) days prior to starting work on computer controlled signalized intersections only. This notice will initiate work to be completed by others. The Contractor shall be responsible for any timely updates that need to be reported to this Unit for the successful coordination of work by others.

The Contractor shall notify the project engineer on construction projects, or the district permit agent on permit jobs, when all traffic signal work is completed. This will include all work at signalized intersections including loop replacements, adjusting existing traffic signals or any relocation work including handholes. The project engineer or district permit agent will notify the Division of Traffic Engineering to coordinate a field inspection of all work. Refer to Section 10.00 – General Clauses For Highway Illumination And Traffic Signal Projects, Article 10.00.10 and corresponding special provision.

GENERAL

Article 1.08.04 - Limitation of Operations - Add the following:

In order to provide for traffic operations as outlined in the Special Provision "Maintenance and Protection of Traffic," the Contractor will not be permitted to perform any work which will interfere with the described traffic operations on all project roadways as follows:

Route 15 (Merritt Parkway)

On the following State observed Legal Holidays:

New Year's Day
Good Friday, Easter*
Memorial Day
Independence Day
Labor Day
Thanksgiving Day**
Christmas Day

The following restrictions also apply:

On the day before and the day after any of the above Legal Holidays.

On the Friday, Saturday, and Sunday immediately preceding any of the above Holidays celebrated on a Monday.

On the Saturday, Sunday, and Monday immediately following any of the above Holidays celebrated on a Friday.

* From 6:00 a.m. the Thursday before the Holiday to 8:00 p.m. the Monday after the Holiday.

** From 6:00 a.m. the Wednesday before the Holiday to 8:00 p.m. the Monday after the Holiday.

During all other times

The Contractor shall maintain and protect traffic as shown on the accompanying "Limitation of Operations" charts, which dictate the minimum number of lanes that must remain open for each day of the week.

Subject to the review and approval of the Engineer, the Contractor will be allowed to halt Route 15 traffic for a period not to exceed 10 minutes to perform necessary work. The Contractor shall submit a plan for such activity and an explanation of the hardship requiring the traffic stoppage. The duration of the traffic stoppages shall be kept to an absolute minimum; and such stoppages shall only be allowed between 12:01 a.m. and 5:00 a.m. on all non-Holiday days.

The Contractor will be allowed to halt Route 15 traffic for a period of time not to exceed ten minutes for the purpose of blasting rock as approved by the Engineer during the following times:

Route 15 Northbound and Southbound

On Tuesday and Wednesday between the hours of 10:00 a.m. and 1:00 p.m.

**Project No. 158-211
Limitation of Operations Chart
Minimum Number of Lanes to Remain Open**

Route: 15 Northbound Location: Within Project Limits Number of Through Lanes: 2								Route: 15 Southbound Location: Within Project Limits Number of Through Lanes: 2							
Hour Beginning	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Hour Beginning	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Mid	1	1	1	1	1	1	1	Mid	1	1	1	1	1	1	1
1 AM	1	1	1	1	1	1	1	1 AM	1	1	1	1	1	1	1
2 AM	1	1	1	1	1	1	1	2 AM	1	1	1	1	1	1	1
3 AM	1	1	1	1	1	1	1	3 AM	1	1	1	1	1	1	1
4 AM	1	1	1	1	1	1	1	4 AM	1	1	1	1	1	1	1
5 AM	1	1	1	1	1	1	1	5 AM	1	1	1	1	1	1	1
6 AM	E	E	E	E	E	1	1	6 AM	E	E	E	E	E	1	1
7 AM	E	E	E	E	E	1	1	7 AM	E	E	E	E	E	1	1
8 AM	E	E	E	E	E	1	1	8 AM	E	E	E	E	E	1	1
9 AM	2	2	2	2	2	2	1	9 AM	2	2	2	2	2	2	2
10 AM	2	2	2	2	2	2	2	10 AM	2	2	2	2	2	2	2
11 AM	2	2	2	2	2	2	2	11 AM	2	2	2	2	2	2	2
Noon	2	2	2	2	2	2	2	Noon	2	2	2	2	2	2	2
1 PM	2	2	2	2	2	2	2	1 PM	2	2	2	2	2	2	2
2 PM	2	2	2	2	2	2	2	2 PM	2	2	2	2	2	2	2
3 PM	E	E	E	E	E	2	2	3 PM	E	E	E	E	E	2	2
4 PM	E	E	E	E	E	2	2	4 PM	E	E	E	E	E	2	2
5 PM	E	E	E	E	E	2	2	5 PM	E	E	E	E	E	2	2
6 PM	2	2	2	2	2	2	2	6 PM	2	2	2	2	2	2	2
7 PM	2	2	2	2	2	2	2	7 PM	1	1	1	1	2	2	2
8 PM	1	1	1	2	2	1	1	8 PM	1	1	1	1	1	1	2
9 PM	1	1	1	1	1	1	1	9 PM	1	1	1	1	1	1	2
10 PM	1	1	1	1	1	1	1	10 PM	1	1	1	1	1	1	2
11 PM	1	1	1	1	1	1	1	11 PM	1	1	1	1	1	1	1

On Holidays and within Holiday Periods, all Hours shall be ‘E.’

‘E’ = maintain existing traffic operations = all available travel lanes, including exit only lanes, climbing lanes and all available shoulder widths shall be open to traffic during this period

Stage Construction

The Contractor shall stage construct this project in accordance with the Typical Traffic Shift Plans and Stage Construction Plans contained in the special provision for Item no. 0971001A. The installation of the concrete curb and gutter section will be performed in accordance with the limitation of operations charts included herein.

The Contractor must maintain an acceleration lane for each on ramp with an acceleration lane length that meet or exceeds the Department’s minimum requirements (300 feet parallel section plus a 350 feet taper section), or that meet or exceeds the length of the existing on ramp acceleration lane. Any changes shall be approved by the Engineer.

The Contractor will not be allowed to have more than 2 work zones on Route 15 in each direction at a time. Each work zone shall be 1.5 miles or less with a minimum of one mile of open roadway between the work zones.

Upon approval of the Engineer, during the allowable period, the Contractor will be allowed to implement lane closures using the Traffic Control Pattern Lane Closure With Shift (S-Pattern) plan included in the Contract plans.

All Ramps and Turning Roadways

The Contractor will not be allowed to perform any work that will interfere with the existing traffic operations on:

Monday through Friday between 6:00 a.m. and 9:00 a.m. and between 3:00 p.m. and 6:00 p.m.

During the allowable periods, the Contractor may close any ramp where the available width is less than 28 feet wide for contract work and detour traffic. The Contractor shall submit a detour plan to the engineer at least two weeks prior to any ramp closure.

Bridge No. 00726 – Newtown Turnpike over Merritt Parkway

The Contractor will not be allowed to perform any work that will interfere with the existing traffic operations on:

Monday through Friday between 6:00 a.m. and 9:00 a.m. and between 3:00 p.m. and 6:00 p.m.

During the performance of the Major Bridge Work, the Contractor will be allowed to close Newtown Turnpike and detour traffic in accordance with the Detour Plan contained in the Contract plans. The duration of the detour shall not exceed eight (8) consecutive weeks.

The Contractor shall notify the Engineer at least 14 days in advance of the start of the Newtown Turnpike closure.

The Contractor will be allowed to halt traffic for a period not to exceed 10 minutes to perform necessary work as approved by the Engineer, between 12:01 a.m. and 5:00 a.m. on all non-Holiday days.

Bridge No. 00736 – Redding Road over Merritt Parkway

The Contractor will not be allowed to perform any work that will interfere with the existing traffic operations on:

Monday through Friday between 6:00 a.m. and 9:00 a.m. and between 3:00 p.m. and 6:00 p.m.

During the performance of the Major Bridge Work, the Contractor will be allowed to close Redding Road and detour traffic in accordance with the Detour Plan contained in the Contract plans. The duration of the detour shall not exceed eight (8) consecutive weeks and be limited to the period within:

Late June – late August of any Contract year.

The detour should not take place during the closure of Newtown Turnpike or during the alternating one-way traffic operation at Merwins Lane.

The Contractor shall notify the Engineer at least 14 days in advance of the start of the Redding Road closure.

The Contractor will be allowed to halt traffic for a period not to exceed 10 minutes to perform necessary work as approved by the Engineer, between 12:01 a.m. and 5:00 a.m. on all non-Holiday days.

Bridge No. 00735 – Merwins Lane over Merritt Parkway

The Contractor will not be allowed to perform any work that will interfere with the existing traffic operations on:

Monday through Friday between 6:00 a.m. and 9:00 a.m. and between 3:00 p.m. and 6:00 p.m.

During the performance of the Major Bridge Work, the Contractor will be allowed to maintain an alternating one-way traffic operation controlled by temporary signalization in accordance with the stage construction plan contained in the contract plans. The duration shall not exceed eight (8) consecutive weeks.

The Contractor will be allowed to halt traffic for a period not to exceed 10 minutes to perform necessary work as approved by the Engineer, between 12:01 a.m. and 5:00 a.m. on all non-Holiday days.

Bridge No. 00729 – Clinton Avenue over Merritt Parkway

The Contractor will not be allowed to perform any work that will interfere with the existing traffic operations on:

Monday through Friday between 6:00 a.m. and 9:00 a.m. and between 3:00 p.m. and 6:00 p.m.

During the performance of the Major Bridge Work, the Contractor will be allowed to maintain an alternating one-way traffic operation controlled by stop signs in accordance with the stage construction plan contained in the contract plans. The duration shall not exceed eight (8) consecutive weeks.

The Contractor will be allowed to halt traffic for a period not to exceed 10 minutes to perform necessary work as approved by the Engineer, between 12:01 a.m. and 5:00 a.m. on all non-Holiday days.

Bridge No. 05763 – Route 33 (Wilton Road) under Merritt Parkway

The Contractor will not be allowed to perform any work that will interfere with the existing traffic operations on:

Monday through Friday between 6:00 a.m. and 10:00 a.m. and between 3:00 p.m. and 7:00 p.m.

Saturday and Sunday between 6:00 a.m. and 10:00 p.m.

During the performance of the Major Bridge Work, the Contractor will be allowed to maintain traffic operation in accordance with the Stage Construction Plans for Bridge No. 00573 and Bridge No. 00728 contained in the contract plans; or Typical Traffic Shift Plans contained in the special provision for Item No. 0971001A.

The Contractor will be allowed to halt traffic for a period not to exceed 10 minutes to perform necessary work, as approved by the Engineer, between 12:01 a.m. and 5:00 a.m. on all non-Holiday days.

Bridge No. 00728 – Saugatuck River under Merritt Parkway (Project No. 158-207)

The Contractor will not be allowed to perform any work that will interfere with the existing traffic operations.

During the performance of the Major Bridge Work, the Contractor will be allowed to maintain traffic operation in accordance with the stage construction plans contained in the contract plans.

The Contractor shall coordinate the stage construction of this bridge with other bridges in the project during construction to ensure that the stages do not conflict. The shoulders on this bridge shall be reconstructed prior to implementing staging construction.

Bridge No. 00730 – Route 57 (Weston Road) under Merritt Parkway

Bridge No. 00733 – Bayberry Lane under Merritt Parkway

Bridge No. 00734 – Cross Highway under Merritt Parkway

The Contractor will not be allowed to perform any work that will interfere with the existing traffic operations on:

Monday through Friday between 6:00 a.m. and 10:00 a.m. and between 3:00 p.m. and 7:00 p.m.

The Contractor will be allowed to halt traffic for a period not to exceed 10 minutes to perform necessary work, as approved by the Engineer, between 12:01 a.m. and 5:00 a.m. on all non-Holiday days.

All Other Roadways

The Contractor will not be allowed to perform any work that will interfere with the existing traffic operations on:

Monday through Friday between 6:00 a.m. and 9:00 a.m. and between 3:00 p.m. and 6:00 p.m.

Saturday and Sunday between 10:00 a.m. and 6:00 p.m.

Additional Lane Closure Restrictions

It is anticipated that construction work including, but not limited to, other projects, permit operations, and work by others will be ongoing simultaneously with this project. The Contractor shall consult with the Engineer to determine if any coordination with this construction work will be required. Other work requiring coordination shall be determined by the Engineer and shall include any other work with construction methods that may affect this project and are in effect at the Bid Opening or are scheduled to be in effect during this Project's construction phase. The Contractor shall begin coordination during the pre-construction phase and continue throughout the Project's duration. Coordination will be required to maintain proper traffic flow at all times on all project roadways, in a manner consistent with these specifications and acceptable to the Engineer.

The Contractor will not be allowed to perform any work that will interfere with traffic operations on a roadway when traffic operations are being restricted on that same roadway, unless there is at least a one mile clear area length where the entire roadway is open to traffic or the closures have been coordinated and are acceptable to the Engineer. The one mile clear area length shall be measured from the end of the first work area to the beginning of the signing pattern for the next work area.

ITEM #0020904A - LEAD COMPLIANCE FOR ABRASIVE BLAST CLEANING

Description:

Work under this item shall include the special handling measures and work practices required for abrasive blast cleaning activities, principally involved in bridge coating removal/painting operations, which impact materials containing or covered by lead paint. Lead paint includes paint found to contain **any** detectable amount of lead by Atomic Absorption Spectrophotometry (AAS) or X-Ray Fluorescence (XRF).

All activities shall be performed in accordance with the OSHA Lead in Construction Regulations (29 CFR 1926.62), the USEPA RCRA Hazardous Waste Regulations (40 CFR Parts 260 through 274), the CTDEEP Hazardous Waste Regulations (RCSA 22a-209-1 and 22a-449(c)), and SSPC Guide 6 – Guide for Containing Debris Generated During Paint Removal Operations.

All activities shall be performed by individuals with appropriate levels of OSHA lead awareness and hazard communication training, supervised at all times by the Contractor's Competent Person, and periodically inspected by personnel working for an industrial hygiene firm (IH firm), retained by the Contractor, under the direct supervision of a Certified Industrial Hygienist (CIH). Periodic inspections shall be conducted at least weekly while work impacting lead is occurring, but shall be as frequent as necessary to maintain Contractor compliance with the OSHA Lead Construction Standards. The Contractor's Competent Person shall be on-site at all times that the work impacting lead is being performed and shall be capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous or dangerous to employees, and has authorization to take prompt corrective measures to eliminate them.

Deviations from these Specifications require the written approval of the Engineer.

Materials:

All materials shall be delivered to the job site in the original packages, containers, or bundles bearing the name of the manufacturer, the brand name and product technical description, with MSDS sheets as applicable.

No damaged or deteriorating materials shall be used. If material becomes contaminated with lead, the material shall be decontaminated or disposed of as lead-containing waste material. The cost to decontaminate and dispose of this material shall be at the expense of the Contractor.

The following material requirements are to be met if to be used during the work:

Fire retardant polyethylene sheet shall be in roll size to minimize the frequency of joints, with factory label indicating minimum six (6) mil thickness.

Polyethylene disposable bags shall be minimum six (6) mils thick.

Tape (or equivalent product) capable of sealing joints in adjacent polyethylene sheets and for the attachment of polyethylene sheets to finished or unfinished surfaces must be capable of adhering under both dry and wet conditions.

Cleaning Agents and detergent shall be lead specific, such as TriSodium Phosphate (TSP).

Labels and warning signs shall conform to 29 CFR 1926.62, 40 CFR 260 through 274 and 49 CFR 172 as appropriate.

Air filtration devices and vacuum units shall be equipped with High-Efficiency Particulate Air (HEPA) filters.

Construction Methods:

(1) Pre-Abatement Submittals and Notices

A. Prior to the start of **any** work that will generate hazardous lead waste above conditionally exempt small quantities (greater than 100 kg/month or greater than 1000 kg stored at any time), the Contractor shall obtain from the Engineer a temporary EPA Hazardous Waste Generators ID number, in accordance with Item 0603222A Disposal of Lead Debris from Abrasive Blast Cleaning, unless otherwise directed by the Engineer. Temporary EPA ID numbers are good for six months from the date they are issued and can be extended once, for a maximum of six months and can't be used for longer than one year. The Contractor will be responsible for notifying the Engineer when an extension is needed.

B. Fifteen (15) working days prior to beginning work that impacts lead paint, the Contractor shall submit four copies of each of the following to the Engineer:

1. A written site-specific Lead Compliance Plan, prepared and stamped by a Certified Industrial Hygienist (CIH), that covers all workers on the project (Contractor, Subcontractor and ConnDOT representatives). The Lead Compliance Plan shall be prepared in accordance with 29 CFR 1926.62(e), and shall include: descriptions of each activity impacting lead; procedures for engineering, work practice, and administrative controls to be employed; daily on-site job-site inspections by the Competent Person; periodic on-site inspections by IH firm personnel (describe frequency and inspection criteria); hazard communication/training; medical surveillance; biological monitoring; exposure assessment air monitoring; personal protective equipment (PPE); respiratory protection; housekeeping; decontamination; procedures for waste containment, storage, handling and disposal; contents of the job completion close-out report; and all other procedures that may be necessary to comply with 29 CFR 1926.62 and 40 CFR 260 – 274.

2. Copies of all employee certificates, dated within the previous twelve (12) months, relating to OSHA lead awareness and hazard communication training and training in the use of lead-safe work practices. SSPC training programs, such as SSPC C-5 Deleading of Industrial Structures may be accepted as meeting these requirements if it can be demonstrated that such training addressed all required OSHA topics.

This information shall be updated and resubmitted annually, or as information changes, for the duration of lead removal work in order to verify continued compliance.

3. Name and qualifications of Contractor's OSHA Competent Person, as defined under 29 CFR 1926.62, who will be on-site at all times that the work impacting lead paint is being performed.
4. Name and qualifications of IH firm personnel that will be performing the periodic on-site inspections. Such personnel shall work under the direct supervision of the CIH that stamped the Lead Compliance Plan and have training within the previous twelve (12) months for OSHA lead awareness and the use of lead-safe work practices or equivalent. Such personnel shall also have a minimum of two years work experience related to the OSHA Lead in Construction Standard and be capable of recognizing the hazards associated therewith.
5. Documentation from the Contractor, typed on company letterhead and signed by the Contractor, certifying that all employees listed therein have received the following, and are medically fit to perform the work impacting lead:
 - a. medical monitoring within the previous twelve (12) months, as required in 29 CFR 1926.62;
 - b. biological monitoring within the previous six (6) months, as required in 29 CFR 1926.62;
 - c. respirator fit testing within the previous twelve (12) months, as required in 29 CFR 1910.134 (for those who don a tight-fitting face piece respirator)

This information shall be updated and resubmitted every 6 months, or as information changes, for the duration of lead removal work in order to verify continued compliance.

6. Names of the proposed non-hazardous, non-RCRA lead waste disposal facility.
7. Names of the proposed scrap metal recycling facilities. The Contractor shall submit to the Engineer all documentation necessary to demonstrate the selected facility is able to accept lead-painted metal.
8. Negative exposure assessments conducted within the previous 12 months documenting that employee exposure to lead for each task is below the OSHA Action

Level of 30 $\mu\text{g}/\text{m}^3$. If a negative exposure assessment has not been conducted, the Contractor shall submit its air monitoring program for the work tasks as part of the Lead Compliance Plan. Until a negative exposure assessment is developed for each task impacting lead paint, the Contractor shall ensure that all workers and authorized person entering the Regulated Area wear protective clothing and respirators in accordance with OSHA 29 CFR 1926.62.

No activity shall commence until all required submittals have been received and found acceptable to the Engineer. Those employees added to the Contractor's original list will be allowed to perform work only upon submittal of acceptable documentation to, and review by, the Engineer.

Contractor shall provide the Engineer with a minimum of 48 hours notice in advance of scheduling, changing or canceling work activities.

(2) Lead Abatement Provisions

A. General Requirements:

All employees of the Contractor who perform work impacting lead paint shall be properly trained to perform such duties. In addition, the Contractor shall instruct all workers in all aspects of personnel protection, work procedures, emergency evacuation procedures and use of equipment including procedures unique to this project.

Contractor shall provide all labor, materials, tools, equipment, services, testing, and incidentals which are necessary or required to perform the work in accordance with applicable governmental regulations, industry standards and codes, and these Specifications.

Prior to beginning work, the Engineer and Contractor shall perform a visual survey of each work area and review conditions.

As necessary, the Contractor shall:

Shut down and lock out electrical power, including all receptacles and light fixtures, where feasible. The use or isolation of electrical power will be coordinated with all other ongoing uses of electrical power at the site.

Coordinate all power and fire alarm isolation with the appropriate representatives.

If adequate electrical supply is not available at the site, the Contractor shall supply temporary power. Such temporary power shall be sufficient to provide adequate lighting and power the Contractor's equipment. The Contractor is responsible for proper connection and installation of electrical wiring and shall ensure safe installation of electrical equipment in compliance with applicable electrical codes and OSHA requirements.

If water is not available at the site for the Contractor's use, the Contractor shall supply sufficient water for each shift to operate the wash facility/decontamination shower units in addition to the water needed at the work area.

The Engineer may provide a Project Monitor to monitor compliance of the Contractor and protect the interests of the Department. In such cases, no activity impacting lead paint shall be performed until the Project Monitor is on-site. Environmental sampling, including ambient air sampling, TCLP waste stream sampling, and dust wipe sampling, will be conducted by the State as it deems necessary throughout the project. Any Project Monitor provided by the Engineer is supplementary to the requirement for the Contractor to have periodic inspections performed at a frequency to ensure/document Contractor compliance with the regulations and the requirements of the Contractor's Lead Compliance Plan. Air monitoring to comply with the Contractor's obligations under OSHA remains solely responsibility of the Contractor.

If at any time, procedures for engineering, work practice, administrative controls or other topics are anticipated to deviate from those documented in the submitted and accepted Lead Compliance Plan, the Contractor shall submit a modification of its existing plan for review and acceptance by the Engineer prior to implementing the change.

If air samples collected outside of the Regulated Area during activities impacting lead paint indicate airborne lead concentrations greater than original background levels or 30 ug/m³, whichever is larger, or if at any time visible emissions of lead paint extend out from the Regulated Area, an examination of the Regulated Area shall be conducted and the cause of such emissions corrected. Cleanup of surfaces outside the Regulated Area using HEPA vacuum equipment or wet cleaning techniques shall be done prior to resuming work.

Work outside the initial designated area(s) will not be paid for by the Engineer. The Contractor will be responsible for all costs incurred from these activities including repair of any damage.

B. Regulated Area

The Contractor shall establish a Regulated Area through the use of appropriate barrier tape or other means to control unauthorized access into the area where activities impacting lead paint are occurring. Warning signs meeting the requirements of 29 CFR 1926.62 shall be posted at all approaches to Regulated Areas. These signs shall read:

DANGER
LEAD WORK AREA
MAY DAMAGE FERTILITY OR THE UNBORN CHILD
CAUSES DAMAGE TO THE CENTRAL NERVOUS SYSTEM
DO NOT EAT, DRINK, OR SMOKE IN THIS AREA

The Contractor shall also implement appropriate engineering controls including a full negative pressure enclosure, in accordance with Item 0603XX1A – Class I Containment & Collection of Surface Prep Debris, and wet dust suppression methods, etc. as necessary, and as approved by

the Engineer, to prevent the spread of lead contamination beyond the Regulated Area in accordance with the Contractor's approved Lead Compliance Plan. Should the previously submitted plan prove to be insufficient to contain the contamination, the Contractor shall modify its plan and submit it for review by the Engineer.

Any air exhausted from the containment enclosure, abrasive-recycling equipment or vacuum equipment shall be passed through a HEPA filtering system. The Contractor is responsible for the design, effectiveness and maintenance of this filtering system. No discharge of debris dust shall be allowed.

C. Wash Facilities:

The Contractor shall provide handwash facilities in compliance with 29 CFR 1926.51(f) and 29 CFR 1926.62 regardless of airborne lead exposure.

If employee exposure to airborne lead exceeds the OSHA Permissible Exposure Limit of 50 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), shower rooms must be provided. The Shower Room shall be of sufficient capacity to accommodate the number of workers. One shower stall shall be provided for each eight (8) workers. Showers shall be equipped with hot and cold or warm running water. Shower water shall be collected and filtered using best available technology and disposed of in accordance with all Federal, State and local laws, regulations and ordinances.

D. Personal Protection:

The Contractor shall initially determine if any employee performing construction tasks impacting lead paint may be exposed to lead at or above the OSHA Action Level of $30 \mu\text{g}/\text{m}^3$. Assessments shall be based on initial air monitoring results as well as other relevant information. The Contractor may rely on historical air monitoring data obtained within the past 12 months under workplace conditions closely resembling the process, type of material, control methods, work practices and environmental conditions used and prevailing in the Contractor's current operations to satisfy the exposure assessment requirements. Monitoring shall continue as specified in the OSHA standard until a negative exposure assessment is developed.

Until a negative exposure assessment is developed for each task impacting lead paint, the Contractor shall ensure that all workers and authorized person entering the Regulated Area wear protective clothing and respirators in accordance with OSHA 29 CFR 1926.62. Protective clothing shall include impervious coveralls with elastic wrists and ankles, head covering, gloves and foot coverings. Sufficient quantities shall be provided to last throughout the duration of the project.

Protective clothing provided by the Contractor and used during chemical removal operations shall be impervious to caustic materials. Gloves provided by the Contractor and used during chemical removal shall be of neoprene composition with glove extenders.

Respiratory protective equipment shall be provided and selection shall conform to 42 CFR Part 84, 29 CFR Part 1910.134, and 29 CFR Part 1926.62. A formal respiratory protection program must be implemented in accordance with 29 CFR Part 1926.62 and Part 1910.134.

E. Air Monitoring Requirements

The Contractor shall:

1. Provide air monitoring equipment including sample filter cassettes of the type and quantity required to properly monitor operations and personnel exposure surveillance throughout the duration of the project.
2. Conduct initial exposure monitoring to determine if any employee performing construction tasks impacting lead paint may be exposed to lead at or above the OSHA Action Level of 30 micrograms per cubic meter. Monitoring shall continue as specified in the OSHA standard until a negative exposure assessment is developed.
3. Conduct personnel exposure assessment air sampling, as necessary, to assure that workers are using appropriate respiratory protection in accordance with OSHA Standard 1926.62 or the approved Lead Compliance Plan. Documentation of air sampling results must be recorded at the work site within twenty-four (24) hours and shall be available for review until the job is complete.

F. Periodic Inspections

The Contractor shall retain the services of IH firm personnel, working under the direct supervision of the CIH that stamped the Lead Compliance Plan, to perform periodic inspections of the job site work practices and engineering controls, on a frequency to ensure/document Contractor compliance with the regulations. Periodic inspections shall be performed at least weekly while work impacting lead is occurring, but shall be at the frequency necessary to maintain Contractor compliance with the OSHA Lead in Construction Standard. Any exceptions to 29 CFR 1926.62 or the accepted Lead Compliance Plan shall be reported to the Contractor and the Engineer prior to the IH firm personnel leaving the site and corrected immediately.

All findings of such periodic inspections shall be documented in writing to the Engineer no later than 10 days following the site visit. At a minimum, the inspection report shall document the following:

1. Description of current work activities
2. Description of engineering controls being implemented
3. Description of PPE being utilized
4. Description of visual review of containment system effectiveness
5. Results of all air sampling received since date of last report
6. Narrative interpreting sample results and making recommendations as necessary
7. Description of waste management practices being utilized

8. Descriptions of exceptions noted and corrective action taken

The report shall include a signature from the IH firm employee that performed the site inspection verifying that the Contractor's work practices are in compliance with 29 CFR 1926.62 and the previously submitted and accepted Lead Compliance Plan. The CIH shall sign verifying their concurrence.

G. Lead Abatement Procedures

The Contractor's Competent Person shall be at the job site at all times during work impacting lead.

Work impacting lead paint shall not begin until authorized by the Engineer, following a pre-work visual inspection by the Project Monitor or Engineer to verify existing conditions.

Any activity impacting lead painted surfaces shall be performed in a manner which minimizes the spread of lead dust contamination and generation of airborne lead.

The Contractor shall conduct exposure assessments for all tasks which impact lead paint in accordance with 29 CFR 1926.62(d) and shall implement appropriate personal protective equipment until negative exposure assessments are developed.

All abrasive blast cleaning work impacting the lead containing/coated materials shall be conducted within an established Regulated Area with a remote wash facility/decontamination system in accordance with "C. Wash Facilities" and the OSHA Lead in Construction Standard. In accordance with 29 CFR 1926.62, engineering controls and work practices shall be utilized to prevent the spread of lead dust and debris beyond the Regulated Area and limit the generation of airborne lead. Such engineering controls shall include the use of a full negative pressure enclosure (NPE) in accordance with SSPC Guide 6 and Item 0603XX1A. All wastes containing lead paint shall be properly contained and secured for storage, transportation and disposal.

The Contractor shall ensure proper entry and exit procedures for workers and authorized persons who enter and leave the Regulated Area. All workers and authorized persons shall leave the Regulated Area and proceed directly to the wash or shower facilities where they will HEPA vacuum gross debris from work suit, remove and dispose of work suit, wash and dry face and hands, and vacuum clothes. Lead chips and dust must not be removed by blowing or shaking of clothing. Wash water shall be collected, filtered, and disposed of in accordance with Federal, State and local water discharge standards. Any permit required for such discharge shall be the responsibility of the Contractor.

No one shall eat, drink, smoke, chew gum or tobacco, or apply cosmetics while in the Regulated Area.

Data from the limited lead testing performed by the Engineer is documented in the reports listed in the “Notice to Contractor – Hazardous Materials Investigations” or is presented herein. Under no circumstances shall this information be the sole means used by the Contractor for determining the extent of lead painted materials. The Contractor shall be responsible for verification of all field conditions affecting performance of the work as described in these Specifications in accordance with OSHA, USEPA, USDOT and CTDEP standards. Compliance with the applicable requirements is solely the responsibility of the Contractor.

Site No. 3 - Bridge No. 00728, Route 15 over Saugatuck River, Westport

- Detectable amounts of lead were identified on the painted metal surfaces of Bridge No. 00728.

Girders, Cross Beams, Beam Ends, Bearings, Rockers, Diaphragms, Connection plates, etc	Metal	Green/Grey	0.1-9.5 mg/cm²
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- TCLP waste stream sampling/analysis of the paint associated with the structural steel bridge surfaces characterized the paint waste as RCRA/CTDEEP hazardous waste.

Paint debris	7.3 mg/l
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Site No. 4 - Bridge No. 00729, Route 15 under Clinton Avenue, Westport

- Detectable amounts of lead were identified on the painted metal surfaces of Bridge No. 00729.

Girders, Cross Beams, Beam Ends, Bearings, Rockers, Diaphragms, Connection plates, etc	Metal	Green	11.6-14.0 mg/cm²
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- TCLP waste stream sampling/analysis of the paint associated with the structural steel/metal bridge surfaces characterized the paint waste as RCRA/CTDEEP hazardous waste.

Paint debris	300 mg/l
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Abrasive blast cleaning techniques which are utilized on surfaces coated with lead paint must be conducted in accordance with the OSHA worker protection and USEPA RCRA/CTDEEP waste disposal standards, and shall be conducted in accordance with Item

0603306A – Abrasive Blast Cleaning and Field Painting of Structure following SSPC-SP10 “Near White Blast Cleaning” procedures.

At Site No. 3 & Site No. 4, the Engineer has previously characterized the projected abrasive paint blast debris associated with the structural steel/metal bridge components as RCRA/CTDEEP Hazardous waste, which shall be handled and disposed of in accordance with USEPA/CTDEEP Hazardous Waste Regulations and 0603222A – Disposal of Lead Debris from Abrasive Blast Cleaning.

Any scrap metal components generated shall be segregated and recycled as scrap metal at the Contractor’s previously submitted scrap metal recycling facility. The recycling of scrap metal (regardless of lead paint concentration) is exempt from USEPA RCRA and CTDEEP Hazardous Waste Regulation.

Should lead contamination be discovered outside of the Regulated Area, the Contractor shall immediately stop all work in the Regulated Area, eliminate causes of such contamination and take steps to decontaminate non-work areas.

H. Prohibited Removal Methods:

The use of sand, steel grit, air, CO₂, baking soda, or any other blasting media to remove lead or lead paint without the use of a HEPA ventilated contained negative pressure enclosure is prohibited.

Power/pressure washing shall not be used to remove lead paint.

Compressed air shall not be utilized to remove lead paint.

Power tool assisted grinding, sanding, cutting, or wire brushing of lead paint without the use of cowled HEPA vacuum dust collection systems is prohibited.

Lead paint burning, busting of rivets painted with lead paint, welding of materials painted with lead paint, and torch cutting of materials painted with lead paint is prohibited. Where cutting, welding, busting, or torch cutting of materials is required, lead paint in the affected area must be removed first.

Chemical stripping of coatings from bridge components is prohibited.

I. Clean-up and Visual Inspection:

The Contractor shall remove and containerize all lead waste material and visible accumulations of debris, paint chips and associated items.

During clean-up the Contractor shall utilize HEPA filtered vacuum equipment.

The Engineer will conduct a visual inspection of the work areas in order to document that all surfaces have been maintained as free as practicable of accumulations of lead in accordance with 29 CFR 1926.62(h). If visible accumulations of waste, debris, lead paint chips or dust are found in the work area, the Contractor shall repeat the cleaning, at the Contractor's expense, until the area is in compliance. The visual inspection will detect incomplete work, damage caused by the abatement activity, and inadequate clean up of the work site.

All debris shall be contained and vacuum collected daily or more frequently as directed by the Engineer, due to debris buildup. Such debris, abrasive blast residue, rust and paint chips shall be stored in leakproof storage containers in the secured storage site, or as directed by the Engineer. The storage containers and storage locations shall be reviewed by the Engineer and shall be located in areas not subject to ponding.

All storage containers (roll offs or drums) shall have a protective liner and removable lid. These containers shall not have any indentations or damage that would allow seepage of the contained material.

If 55 gallon barrels are used, staging is required: 55 gallon barrels shall be stored together in two rows of five. The Contractor shall maintain a minimum lane clearance of 36 inches between each (barrel lot of ten).

The Contractor shall maintain a secure storage site, which shall be large enough to handle all debris. The Contractor shall store debris only in the secured storage site. During abrasive blast cleaning operations, all surface preparation debris shall be vacuum collected from the containment enclosure and removed to the abrasive recycling reclaimer unit, and the coating debris shall be conveyed to the secured storage site at the conclusion of the work shift. The Contractor shall account for all coating debris conveyed to the secured storage site and all coating debris transported from the project for disposal.

The secure storage site shall consist of an 8-ft. high fenced-in area with a padlocked entrance. Storage containers shall not be used on the project until and unless they have been reviewed and approved by the Engineer. Storage containers and sites shall be located so as not to cause any traffic hazard. Container storage sites shall be in areas that are properly drained and runoff water shall not be allowed to pool and shall be out of the 100-year flood plain. The containers shall be placed on pallets or other approved material and not directly on the ground.

Storage containers shall be closed and covered with a waterproof tarpaulin at all times except during placement, sampling and disposal of debris.

J. Post-Work Regulated Area Deregulation:

Following an acceptable visual inspection, any engineering controls implemented may be removed.

A final visual inspection of the work area shall be conducted by the Competent Person and the Project Monitor or Engineer to ensure that all visible accumulations of suspect materials have been removed and that no equipment or materials associated with the lead paint removal remain. If this final visual inspection is acceptable, the Contractor will reopen the Regulated Area and remove all signage.

The Contractor shall restore all work areas and auxiliary areas utilized during work to conditions equal to or better than original. Any damage caused during the performance of the work activity shall be repaired by the Contractor at no additional expense to the State.

K. Waste Disposal/Recycling:

Non-metallic building debris waste materials tested and found to be non-hazardous Construction and Demolition (C&D) bulky waste shall be disposed of properly at a CTDEEP approved Solid Waste landfill.

Metallic debris shall be segregated and recycled as scrap metal at an approved metal recycling facility.

Hazardous lead debris shall be disposed of in accordance with Item 0603222A, Disposal of Lead Debris from Abrasive Blast Cleaning.

L. Project Closeout Data:

Provide the Engineer, within thirty (30) days of completion of the project site work, a compliance package; which shall include, but not be limited to, the following:

1. Competent persons (supervisor) job log;
2. Certification that all requirements of the Lead Compliance Plan and OSHA Lead in Construction Standards, including training, medical surveillance, biological monitoring and medical removal protection, have been followed;
3. Copies of each periodic inspection report;
4. Report on regulatory compliance prepared by the CIH based on the periodic inspections performed.
5. OSHA-compliant personnel air sampling data;
6. Completed waste shipment papers for non-hazardous, non-RCRA lead waste disposal or recycling and scrap metal recycling.

M. Non Compliance:

Failure of the Contractor to implement the requirements of 29 CFR 1926.62, its Lead Compliance Plan, or any other requirement of this item shall, at the sole discretion of the Engineer, result in the suspension of all Contract work until such deficiencies are corrected.

Method of Measurement:

This item will include all noted services, equipment, facilities, testing and other associated work, including up to three (3) ConnDOT project representatives. Services provided to any ConnDOT project representatives in excess of three (3) representatives will be measured for payment in accordance with Article 1.09.04 – “Extra and Cost-Plus Work.”

1-Within thirty (30) calendar days of the award of the Contract, the Contractor shall submit to the Engineer for acceptance a breakdown of its lump sum bid price for this item detailing:

- (a) The development costs associated with preparing the Lead Compliance Plan in accordance with these Specifications.
- (b) The cost per month for the duration of the Project to implement the Lead Compliance Plan and provide the services of the CIH and IH firm.

2-If the lump sum bid price breakdown is unacceptable to the Engineer; substantiation showing that the submitted costs are reasonable shall be required.

3-Upon acceptance of the payment schedule by the Engineer, payments for work performed will be made as follows:

- (a) The lump sum development cost will be certified for payment.
- (b) The Contractor shall demonstrate to the Engineer monthly that the Lead Compliance Plan has been kept current and is being implemented and the monthly cost will be certified for payment.
- (c) Any month where the Lead Compliance Plan is found not to be current or is not being implemented, the monthly payment for the Lead Compliance for Abrasive Blast Cleaning Item shall be deferred to the next monthly payment estimate. If the Lead Compliance Plan is not current or being implemented for more than thirty calendar days, there will be no monthly payment.
- (d) Failure of the Contractor to implement the Lead Compliance Plan in accordance with this Specification shall result in the withholding of all Contract payments.

Basis of Payment:

The lump sum price bid for this item shall include: services, materials, equipment, all permits, notifications, submittals, personal air sampling, personal protection equipment, incidentals, fees and labor incidental to activities impacting lead removal, treatment and handling of lead contaminated materials, and the transport and disposal of any non-hazardous lead construction and demolition (C&D) bulky waste.

Final payment will not be made until all project closeout data submittals have been completed and provided to the Engineer. Once the completed package has been received in its entirety and accepted by the Engineer, final payment will be made to the Contractor.

<u>Pay Item</u>	<u>Pay Unit</u>
Lead Compliance for Abrasive Blast Cleaning	Lump Sum

END OF SECTION

ITEM #0406163A - HIGH FRICTION SURFACE TREATMENT

Description: Under this item, the Contractor shall furnish and install a High Friction Surface Treatment (HFST) onto a bituminous concrete pavement. The HFST consists of a polymeric resin binder and calcined bauxite aggregate.

Materials: The materials for this work are polymeric resin binder and calcined bauxite aggregate and must meet the following requirements:

- 1. Polymeric Resin Binder:** The polymeric resin binder shall meet the requirements of Table 1 and be clearly labeled by the Manufacturer.

Table 1: Polymeric Resin Binder Requirements

Property	Test Method	Requirement
Viscosity, Poises	ASTM D2556	7 – 30 Poises
Ultimate Tensile Strength, psi	AASHTO M 235, Class C	2,500 - 5,000 psi
Compressive Strength, psi	ASTM C579	1,000 psi (min.) (3 hours) 5,000 psi (min.) (7 days)
Gel Time, minutes	AASHTO M 235, Class C	10 minutes (min.)
Water Absorption, %	AASHTO M 235	1% (max.)
Durometer Hardness (Shore D)	ASTM D2240	60 - 80
Cure Rate (Dry through time), hours	ASTM D1640, 55 mil wet thickness @ 75 °F	3 hours (max.)
Elongation at Break Point, %	AASHTO M 235	30 – 70%
Mixing Ratio	Provide manufacturer's recommendations a minimum of 60 days prior to construction	Per Manufacturer
Adhesion Strength, psi @ 24 hrs.	ASTM D4541	250 psi (min.) or 100% substrate failure

- 2. Calcined Bauxite Aggregate:** The aggregate shall be calcined bauxite that is clean, dry, free from foreign matter, and shall meet the requirements in Table 2.

Table 2: Aggregate Material Properties Requirements

Property	Test Method	Requirement
Gradation Sieve Designation No. 4 (4.75 mm) No. 6 (3.35 mm) No. 16 (1.18 mm)	AASHTO T 27	Percent Passing (min.) 100% 95.0-100.0% 0.0-5.0%
Moisture Content, %	AASHTO T 255	0.2% (max.)
Aluminum Oxide, %	ASTM C25	87% (min.)
LA Abrasion Test, %	AASHTO T 96, (D grading)	20% (max.)

The Contractor shall submit Materials Certificates for both the polymeric resin binder and calcined bauxite aggregate 30 days prior to use. In addition, a Certified Test Report (CTR) shall be submitted that indicates the material meets the requirements listed in Tables 1 and 2. The CTR shall be produced by an accredited third party laboratory listing the properties identified in Tables 1 and 2. All material testing for the Certified Test Report shall be performed within the 12 months prior to Contractor submittal. A sample of each part of the polymeric resin and a sample of the calcined bauxite aggregate shall be made available if requested by the Engineer. All requirements of this section shall meet the requirements of Section 1.06 of the Standard Specifications and Minimum Schedule of Acceptance Testing.

Material Safety Data Sheets (MSDS), Product Data Sheets, and other information pertaining to the health hazards and the safe practices for the storage, handling, and disposal of the materials shall be obtained from the manufacturer and posted at storage areas. A copy of such information shall be provided to the Engineer.

Construction Methods: The following conditions must be met for proper application of the HFST:

1. **Quality Control (QC) Plan:** The Contractor shall submit a Quality Control Plan (QCP) for placement of the HFST for review by the Engineer a minimum of 30 days prior to placement of the HFST. The QCP shall include the following:
 - a. Project schedule.
 - b. Name and location of polymer resin production plant.
 - c. Name and location of aggregate production plant.
 - d. Procedures for stockpiled and onsite materials storage including methods to control aggregate moisture.
 - e. Description of equipment for measuring, mixing, placing, and finishing HFST including any hand applied methods.
 - f. Equipment calibration records.
 - g. Cleaning and maintenance schedule for the truck mounted application machine.
 - h. Method for protecting structures within or adjacent to placement.
 - i. Manufacturer's estimated cure time and action to ensure the estimated cure time is met.
 - j. Corrective actions to be taken for unsatisfactory construction practices and deviations from specifications.
 - k. Description of the methods to be used to meet the clean-up requirements.
 - l. Disposal plan for excess material and containers.
 - m. Name of the certified independent testing laboratory.
 - n. The name and contact information for the manufacturer's representative who will train the Department's construction personnel prior to placing the HSFT and be available during application as necessary.
2. **Weather Restrictions:** The polymer resin binder shall be placed on a dry surface when the ambient and surface temperatures are 55°F and rising and below 105°F. HFST materials shall not be placed when inclement weather conditions are forecasted within 24

hours of application or as determined by the Engineer.

- 3. Surface Preparation:** Prior to application of the HFST, roadway patching, crack filling, crack sealing, and all other distress repairs shall be made. All cracks greater than 1/4" shall be sealed or filled.

In addition, locations receiving a HFST shall be free of pavement markings and delineation prior to placement of polymeric resin binder. The Contractor shall close roadways that are free of pavement markings and delineation to traffic.

All surfaces must be clean, dry, and free of all dust, oil, debris and any other material that might interfere with the bond between the polymer resin binder material and the existing surfaces. The surface shall be cleaned by use of mechanical or vacuum sweepers, high pressure air or other methods approved by the manufacturer of the binder prior to installation.

For application on new asphalt pavements a mandatory 30 day period must take place prior to the installation of the HFST.

Exposed utilities, drainage structures, curbs, and any other structures within or adjacent to the treatment location shall be protected by the Contractor and shall not have any HFST materials applied to them.

- 4. Binder Application:** The polymeric resin binder shall be blended and applied per the manufacturer's recommendations with automated equipment that provides continuous application and is also capable of heating, continuously mixing, metering, and applying the polymeric resin binder at a uniform rate of 0.28 to 0.32 gal./s.y.

If locations that require HFST are located outside the capabilities of the automated equipment, then manual mixing and application of the binder may be used, if approved by the Engineer. The binder components shall be mixed to the correct proportion within 4% by weight using a low speed high torque drill fitted with a helical stirrer. The mixed components shall be hand applied onto a prepared pavement surface using a serrated edged squeegee resulting in a minimum coverage rate of 0.28 to 0.32 gal./s.y.

Spiked shoes must be worn if there is any contact with the wet uncured binder prior to application of the aggregate. If there is any contamination of the surface from walking, standing or from any other contact or disturbance of the wet uncured binder prior to application of the aggregate, the Engineer will direct that section to be removed and replaced at the Contractor's expense.

- 5. Aggregate Application:** Immediately after the polymeric resin binder is placed, the aggregate shall be applied to the surface with a drop spreader at a rate of 11 to 15 lb./s.y. Aggregate placement shall be uniform and without disruption of the in-place binder.

If there are locations requiring a HFST that are outside of the capabilities of the aggregate

drop spreader, manual application may be used with approval of the Engineer. If approved, the aggregate can be sprinkled or vertically dropped without splashing the wet resin binder during placement. The polymeric resin binder shall be covered with the calcined bauxite aggregate within 5 minutes of placement.

- 6. Curing and Clean Up:** The HFST must be allowed to cure as recommended by the manufacturer's specifications. After the HSFT has cured, and prior to installation of pavement markings, any excess and loose aggregate must be removed from the shoulders and travel lanes.

Pavement markings must be installed prior to opening the area to any vehicular traffic. Pavement markings shall be compatible with the epoxy resin binder and shall not be recessed.

A secondary clean up shall be performed 3 to 5 days after construction. A final clean up shall be performed 3 to 5 weeks after construction. If areas receiving a HFST are not cleaned up per this specification then payment will be withheld.

- 7. Field Acceptance and Testing:** The HFST shall be uniform in appearance and texture. As directed by the Engineer, patches of exposed polymeric resin shall be removed and replaced at the expense of the Contractor. At the Engineer's discretion, the Department will test the HFST in accordance with ASTM E274 (FN40R corrected by using the correction factors listed in Table 3). When tested the surface shall have a minimum friction number of 72. Locations failing to meet the friction requirements shall be removed and replaced at the Contractor's expense.

Table 3: High Friction Surface Correction Factors for ASTM E274 Testing

Test Speed (mph)	FN Correction	Test Speed (mph)	FN Correction	Test Speed (mph)	FN Correction
20	-9.3	30	-4.8	40	0.0
21	-8.9	31	-4.4	41	0.5
22	-8.4	32	-3.9	42	1.0
23	-8.0	33	-3.4	43	1.5
24	-7.6	34	-2.9	44	2.0
25	-7.1	35	-2.5	45	2.5
26	-6.7	36	-2.0	46	3.1
27	-6.2	37	-1.5	47	3.6
28	-5.8	38	-1.0	48	4.1
29	-5.3	39	-0.5	49	4.6

Method of Measurement: This work will be measured for payment by the number of square yards placed and accepted by the Engineer. This area will be measured in the field or computed from the payment limits shown on the plans and as ordered.

Basis of Payment: The HFST will be paid for at the Contract unit price per square yard for "High Friction Surface Treatment," complete in place. The price shall include all materials,

equipment, tools, and labor incidental thereto.

Removal of pavement markings will be measured and paid for under the respective pay item.

Installation of pavement markings will be measured and paid for under the respective pay item.

Roadway patching, crack filling, crack sealing, and all other distress repairs will be measured and paid for under the respective pay items.

<u>Pay Item</u>	<u>Pay Unit</u>
High Friction Surface Treatment	s.y.

0503253A - CLEAN HISTORIC CONCRETE BRIDGE (SITE NO. 4)

0503254A - CLEAN HISTORIC CONCRETE BRIDGE (SITE NO. 5)

0503255A - CLEAN HISTORIC CONCRETE BRIDGE (SITE NO. 6)

0503259A - CLEAN HISTORIC CONCRETE BRIDGE (SITE NO. 9)

0503268A - CLEAN HISTORIC CONCRETE BRIDGE (SITE NO. 10)

Description: The work includes the cleaning of exposed concrete surfaces of historic bridges within the limits specified by the Engineer, including general and specialized cleaning to remove soil, stains, carbon deposits, biological growth, oils, plants, vines, bird guano, and all other substances specified below. Also included is the full containment, collection and proper disposal of all wash water and materials removed from the concrete surfaces during cleaning operations.

This work will include the trial demonstration by the Contractor of specific cleaning methods on selected areas of the bridge surface to demonstrate the adequacy of materials and methods to be used for cleaning each type of condition on areas of the bridge for approval by the Engineer.

The Contractor to perform this work shall demonstrate a minimum of five (5) years of successful cleaning experience in masonry restoration projects for historic structures. The Contractor shall provide names, dates, and locations of a minimum of three (3) similar historic structure projects.

This provision contains recommendations for materials which may be TOXIC. The manufacturer's literature on application techniques, appropriate protection for workers and disposal procedures for materials should be complied with in conjunction with all federal and state regulations. All required Federal and State permits shall be obtained prior to use and/or discharge.

Materials:

1. Cleaning Tools and Product Data:

The Contractor shall submit manufacturer's technical data for each liquid cleaning product proposed to be used, including written instructions by the manufacturers for their application and use, and Material Safety Data Sheets (MSDS). The Contractor shall include test reports and certifications substantiating product compliance with requirements.

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Recommended Products: Products capable of removing biological and atmospheric stains in historic concrete shall be either of the following, or an approved equal:

EnviroKlean BioKlean® (by Prosoco, Inc.) Two part cleaner and activator system.

Safe n' Easy Architectural Cleaner and Restorer (by Dumond Chemicals)

The use of acidic cleaners shall not be permitted.

All water used in the cleaning operation shall be potable, free of deleterious quantities of iron, alkalis, oil or other staining materials. Prior to the cleaning, a sample of the water shall be tested to determine that the water will not cause staining. The Contractor shall provide all necessary filters at the water source to remove mineral contents that cause the staining. No water is to be drawn from ponds or streams without the approval by the Engineer. At no time will a general permit limit be reached for the removal of water.

Cleaning products shall be applied using synthetic rollers, soft-bristled brushes, or may be spray applied. The use of wire brushes or steel wool is not permitted.

Following manufactures recommendations rinsing shall be carried out carefully to avoid inadequate rinsing, which can lead to residues that may stain the cleaned surface. Masonry-washing equipment shall not generate greater than 400 psi. (2.8 MPa) Water flow rates of 6-8 gallons (23-31 L) per minute are the best water/pressure combinations. Heated water (150-180°F, 65-82°C) may improve cleaning efficiently.

2. **Delivery, Storage and Handling:**

All materials shall be delivered to the site in the Manufacturer's original and unopened containers and packaging, bearing labels as to the type of material, brand name and Manufacturer's name. Delivered materials should be identical to tested materials.

Material shall be stored off the ground in a clean, dry location. All materials that are damaged or are otherwise unsuitable for use shall be removed from the site.

All materials shall be handled, stored and treated in strict accordance with manufacturer's instructions, with regard to application and shelf life, spillage, clean-up, safety precautions, and protective means and methods.

Construction Methods:

1. **Cleaning Program:** Prior to commencing cleaning operations, the Contractor shall submit a written cleaning procedure plan including all materials, methods, equipment, and staging for access proposed for each phase of cleaning including protection of surrounding materials during operations. The written cleaning procedure shall include all

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cleaning products and chemical components to be used, method of application, dilution of the application, temperature of application, length of time of surface contact, method of rinsing (*temperature, pressure, and duration*), and repetition of procedures, methodology for full collection of all water, proper disposal of all materials. An acceptable ambient temperature range shall also be maintained for application of cleaning products and shall follow in accordance with the manufacturer's recommendations and specifications.

2. **Protection Program:** Prior to commencing the cleaning operations, the Contractor shall submit for approval, a written description of proposed materials and methods of protection for preventing damage to adjacent materials, soil, water bodies, wetlands, wells, vegetation, vehicular and pedestrian traffic, and adjacent property.
3. **Demonstration Test Area:** Prior to commencing the cleaning operations, the Contractor shall demonstrate a trial application of the proposed cleaning method on a portion of the wingwall or abutment face, as directed by the Engineer. The surface area of the cleaning demonstration test shall be approximately six (6) by six (6) feet (610 x 610mm) in area. The demonstration test area shall be cleaned using methods, materials and working pressures previously submitted and approved. The demonstration test shall be performed in the presence of the Engineer and Conservator.

Where chemical poultices are tested, perform testing in the presence of the Manufacturer's representative.

The production work of cleaning the bridge concrete surfaces shall not begin without approval from the Engineer of the cleaning methods, working pressures, materials, equipment used. The evaluation by the Engineer of the acceptability of the Contractor's proposed cleaning method will include a seven (7) day observation period after completion of the trial cleaning demonstration for verification that the requested cleaning method has caused no surface damage to historic concrete surfaces.

4. **Preparation:**

- a. Demonstration Test Area: Prepare test area as specified above.
- b. Cleaning Program: The cleaning program shall be submitted as specified above.
- c. Protection: All painted and unpainted metal structure, railings and decorative elements shall be protected from contact with chemical cleaners by covering with polyethylene film, waterproof masking or other proven measures, firmly fixed and sealed to the surface.

The Contractor shall comply with the cleaning product manufacturer's recommendations for protecting adjacent surfaces from exposure to their products.

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Over-spray and splashing of the cleaning materials shall be prevented.

All persons, soil, surrounding vegetation and adjacent property shall be protected from injury, damage and contamination at all times during the cleaning process.

5. General Cleaning:

- a. Dilution of cleaning materials shall be with clean water in accordance with the manufacturer's printed instructions.
- b. Cleaning projects should be carried out starting at the bottom and proceeding to the top of the cleaning area.
- c. Always keep surfaces wet below the area being cleaned.
- d. All bridge surfaces shall be cleaned in accordance with the cleaning procedure approved by the Engineer. The surface cleaning should be done in strict accordance with the methods approved by the Engineer on the demonstration test area.
- e. All painted and unpainted metal structure, railings, and decorative elements shall be protected from contact by the cleaning operations by covering with polyethylene film, waterproof masking or other proven measures, firmly fixed and sealed to the surface. No adhesive residue shall remain on protected elements after removal of protection.

6. Specialized Cleaning:

Additional and more local cleaning methods are to be used, subject to the Engineer's approval. Detergents and other non-detrimental chemicals can be applied to the surface with fibrous, non-ferrous soft bristle brushes, spray, or roll applied methods. When soil is sufficiently loosened, the concrete shall be thoroughly rinsed so that no residue remains. Poultices may also be used if approved by the Engineer.

Prior to any stain removal treatment, thoroughly wet the surface of the concrete around the stained area with clear, clean water at low pressure. Apply specialized stain removers as specified by the manufacturer and rinse thoroughly with clean, clear water at low pressures (100 – 300 psi. (0.7 – 2.1 MPa))

Method of Measurement: Work under this item will be paid for at the contract lump sum price for each bridge site, and will not be measured for payment. The Contractor shall

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submit a schedule of values for each site to the Engineer for review and comment prior to the performance of work.

Basis of Payment: This work will be paid for at the contract lump sum price at each bridge site for “Clean Historic Bridge (Site No.)” which price shall include all equipment, tools, labor and work incidental thereto, including acquisition of required permits, containment, collection and proper disposal of all waste, wash water and other cleaning elements used. This price shall also all work, materials, and equipment incidental to providing staging for Contractor and inspection access and debris shields as required to protect traffic from the cleaning operation.

Removal of Graffiti, where directed by the Engineer, shall be paid for under the special provision item, “Removal of Graffiti from Historic Concrete”, after the bridge has been cleaned in accordance with this specification.

The removal and resetting of fence for the purpose of Contractor access at miscellaneous location shall be included in the general cost of work for this item and shall not be measured for payment.

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ITEM #0503307A - RESTORATION OF METAL FEATURES

Description: This work includes the repair, removal of damaged elements, replacement of missing elements, testing and analysis of metal and paint, re-finishing of ornamental metal railings, decorative metal panels, and/or other decorative metal features within the limits shown on the plans. Included are containment, collection and disposal of existing paint finishes and debris.

The Contractor to perform this work shall demonstrate a minimum of five (5) years of successful experience in restoration projects for historic structures. The Contractor shall provide names, dates, and locations of a minimum of three (3) similar projects.

This provision contains recommendations for materials which may be TOXIC. The manufacturer's literature on application techniques, appropriate protection for workers and disposal procedures for materials should be complied with in conjunction with all federal and state regulations. All required Federal and State permits shall be obtained prior to use and/or discharge. Refer to "Notice to Contractor – Hazardous Materials Investigations" report for Bridge #00729 for information regarding the testing conducted. Additional information on paint removal and definitions of the terms used within this special provision may be obtained from the latest edition of the "SSPC-GUIDE 6 for Containing Debris Generated during Paint Removal Operations" (SSPC Guide 6).

Materials:

Paint: Shall conform to the requirements of M.07.01 and M.07.02 of the Standard Specifications, Form 816, except as supplemented and amended within this specification.

Repair Materials: Selection of repair materials for metal will be based on the testing and identification of the extant original materials on Bridge #00729.

Coating Systems: Ensure compatibility between each type of coating by using primers, undercoats and finish coats that are produced by the same manufacturer. Follow manufacturers' instructions regarding the preparation of each coating in the system. The following manufacturers' systems are approved for use:

Tnemec Products:	Primer: Series 394 PerimePrime Finish Coat: Series 27 Typoxy or Series 73 Endura-Shield
Sherwin-Williams Products:	Primer: Pro-Cryl Universal Primer Finish Coat: Sher-Cryl HPA

or equal approved by Engineer.

Fasteners: Unless otherwise directed by the Engineer, all fasteners are to be stainless steel.

Construction Methods:

Testing: Prior to commencing restoration operations, the Contractor shall conduct sampling of the existing finishes and metals to be delivered to an architectural conservator for analysis and identification. The finishes will undergo a historic paint analysis to determine the historic color and appearance of the bridge. The microscopic examination of the layers of paint will identify the substrate, primer(s) and successive finish layers using the Federal Standard No. 595a Colors numbering system. Similarly, the Contractor is responsible for identifying the type of metal and alloys used in the construction of the bridge features. This information will be used to select the materials that will be used to repair or replace damaged and missing elements in kind.

Preparation: Examine substrates and conditions under which coatings will be applied for compliance with requirements on applying coatings. Surfaces to receive coatings must be thoroughly dry and free of grease, oil and soiling before coatings are applied.

Containment of Paint Debris: A containment enclosure or enclosures shall be erected to collect the paint debris. This containment enclosure shall be designed and erected to contain, as well as facilitate the collection of debris from the paint removal operations. The containment enclosure shall conform to the requirements found within the SSPC Guide 6. The class of the containment enclosure shall be a minimum of Class 3P or Class 3C depending upon the method of removal, modified to include paragraphs A) through E).

- A) The containment materials shall be air and water impenetrable and fire resistant.
- B) With the exception of the entryways, all seams in the containment enclosure shall be lapped a minimum of 24 inches and shall be tied off at intervals not to exceed 12 inches.
- C) All attachments to the bridge deck shall be sealed to prevent the escape of dust and debris
- D) The area between beams under the bridge deck shall be sealed to prevent the escape of dust and debris.
- E) Drawings and details of the containment enclosure shall be submitted to the Engineer for review prior to any paint removal. Review of the containment enclosure by the Engineer shall in no way relieve the Contractor of his responsibility for the containment enclosure.

Substrate Surface Preparation: Prepare metal elements by removing existing coatings, localized corrosion and scale to a minimum of SSPC-SP3 Power Tool Cleaning. Do not allow more than 24 hours to pass before applying a primer coat to protect the newly prepared metal. Protect adjacent materials that are not to receive coatings by masking with painter's tape and drop cloths.

Application of Coatings: Apply material by brush, roller, or spray strictly according to the manufacturer's directions. Use brushes best suited for the material being applied. Use rollers as recommended by the manufacturer for the material and texture required.

- Do not apply coatings over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to forming a durable coating film.
- Apply material at the coverage rate recommended by the manufacturer unless otherwise indicated.
- The number of coats and film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Where sanding is required, according to the manufacturer’s directions, sand between applications to produce a smooth, even surface.
- Apply finish coat within 14 days of primer application. Select a primer color that is in the family range as the finish coat, but different enough to discern holiday and incomplete coverage of the finish coats.
- When undercoats or other conditions show through the final coat, apply additional coats until the cured film has a uniform coating finish, color, and appearance. Give special attention to edges, corners, crevices, welds, exposed fasteners, and similar surfaces to ensure that they receive a dry film thickness equivalent to that of flat surfaces.

At the end of each work day, remove rubbish, empty paint cans, and other discarded materials from the site.

Method of Measurement: This work will be paid for on a lump sum basis and will not be measured for payment.

Basis of Payment: This work will be paid for at the contract lump sum price for “Restoration of Metal Features” complete in place, which shall include all repair of damaged elements, replacement of missing elements, materials, testing and analysis of paint, containment, collection and disposal of existing paint and debris, re-finishing of ornamental metal railings, decorative metal panels, and/or other decorative metal features and all labor and incidentals thereto. Removal of existing coating systems and surface preparation of the metal surfaces will be addressed under the item, “Recyclable Encapsulated Abrasive Media Cleaning.”

<u>Pay Item</u>	<u>Pay Unit</u>
Restoration of Metal Features	L.S.

ITEM #0511006A - CLEANING WEEPHOLES

Description:

Work under this item shall include removal of existing wire mesh at existing weep holes and cleaning of existing weepholes on the bridge deck as per the plans.

Work under this item shall also include the installation of a new galvanized wire mesh as shown on the plans, or as directed by the Engineer.

Materials:

The wire mesh shall be galvanized.

Method of Measurement:

Each weephole cleaned and accepted will be counted for payment.

Basis of Payment:

This work will be paid for at the contract unit price, per each, for “Cleaning Weepholes”, complete in place, which price shall include all materials, equipment, tools and labor incidental thereto.

Pay Item
Cleaning Weepholes

Pay Unit
Ea.

ITEM #0511204A - EXTEND EXISTING WEEPHOLES

Description:

Work under this item shall consist of installing PVC pipe with a flexible hose and attaching it to steel brackets, below the bridge deck, in order to extend the existing broken deck weepholes to a point below the bottom of deck/ edge beam.

Materials:

PVC plastic pipe shall conform to the requirements of Subarticle M.08.01-27, of Form 816.

Rubber hose shall conform to the requirements of ASTM D3572.

Hardware shall be stainless steel or galvanized and commercial grade.

Construction Methods:

Installation of rubber hose and new lengths of PVC pipe shall be performed after cleaning and painting of the structural steel has been completed.

The new length of PVC pipe shall be attached to the existing weepholes to remain and to the new support plates by means of "U" bolts with lock nuts and washers as directed by the Engineer. Installation shall be as close to vertical as practical unless directed otherwise by the Engineer. The length of pipe shall be such that the bottom end stops 3 inches below the adjacent girder bottom flange and the length of rubber hose connection at the top end is as short as practical without any kinking of the hose.

The diameter of the rubber hose shall be such that it fits snugly around the exterior of the new PVC pipe and the stub end of the existing pipe protruding below the deck. In cases where the protruding stub is not sufficiently long enough to allow installation of the rubber hose and band clamp, a short length of PVC pipe shall be inserted into the existing pipe in order to extend it. The joint between the new and old pipes shall be thoroughly cleaned and solvent welded.

Method of Measurement:

Each existing deck weephole extended shall be counted for payment when complete and accepted.

Basis of Payment:

This work shall be paid for at the contract unit price, per each, for "Extend Existing Weepholes", which price shall include all materials, equipment, tools and labor incidental thereto.

<u>Pay Item</u>	<u>Pay Unit</u>
Extend Existing Weepholes	EA.

ITEM #0520041A – PREFORMED JOINT SEAL

Description: Work under this item shall consist of furnishing and installing a preformed joint seal as shown on the plans and in conformance with these Specifications or as directed by the Engineer. Work shall also include a pre-installation survey for measurement of the existing joint opening width and preparation of the joint opening surfaces as needed to ensure proper performance of the preformed joint seal. The preformed joint seal shall seal the deck surface in accordance with the plans and prevent water from seeping through the joint area.

Work under this item shall also include the installation of Elastomeric trough and PVC pipe under the joint as shown on plans. Installation of the steel elements of the Trough is included under the Item “Rehabilitation of Existing Structural Steel”.

Materials: The preformed joint seal shall be one of the following:

1. Silicoflex:
RJ Watson, Inc -- Bridge and Structural Engineered Systems
78 John Glenn Drive
Amherst, New York 14228
Tel: (716) 691-3301 Fax: (716) 691-3305
Website: <http://www.rjwatson.com>

2. V-Seal:
D.S. Brown Company
300 East Cherry Street
North Baltimore, Ohio
Tel: (419) 257-3561
Website: <http://www.dsbrown.com>

3. Bridge Expansion Joint System (B.E.J.S.):
EMSEAL Joint Systems Ltd.
25 Bridle Lane,
Westborough, MA 01581
Tel: (508) 836-0280
Website: <http://www.emseal.com>

A Materials Certificate for all components of the selected preformed joint seal shall be submitted by the Contractor in accordance with the requirements of Article 1.06.07

Elastomeric Trough: The trough material shall be fiberglass fabric coated with neoprene rubber on both sides. The attachment hardware shall be ASTM A36 steel galvanized in accordance with ASTM A153.

Polyvinyl Chloride Plastic Pipe: The pipe shall conform to the requirements of Subarticle M.08.01-20 PVC Pipe or M.08.01-21 PVC Gravity Pipe and shall be schedule 40.

Construction Methods: All work at each joint location shall be accomplished in conformance with the traffic requirements in the Special Provisions, “Maintenance and Protection of Traffic” and “Prosecution and Progress”.

At all joint locations, the Contractor shall perform a survey of the existing joint openings. This information shall include, but not be limited to:

- a) Joint opening width (taken at distances along the length of the joint not to exceed 6’)
- b) Temperature at time of measurement of joint opening width.
- c) Identification of sharp discontinuities in the joint alignment or its surfaces.

At least 30 days prior to start of the work, the Contractor shall submit a detailed Quality Control Plan to the Engineer for review and comment for the installation of the selected joint system. The submittal shall include:

- a) All information gathered during field survey.
- b) A list of all manufactured materials and their properties to be incorporated in the joint system, including, but not limited to the primer, bonding agent, sealant, and the sealing element.
- c) A detailed step by step installation procedure and a list of the specific equipment to be used for the installation.

The Quality Control Plan must fully comply with the specification’s requirements and address all known and anticipated field conditions, including periods of inclement weather.

A technical representative of the selected joint system, approved by the manufacturer, shall be notified of the scheduled installation a minimum of 2 weeks in advance and be present to provide direction and assistance for the first joint installation and succeeding joint installations until the Contractor becomes proficient in the work and to the satisfaction of the Engineer.

Tools, equipment, and techniques used to prepare the joints and materials shall be approved by the Engineer and the manufacturer's technical representative prior to the start of construction.

The minimum temperature for installing any of the qualified preformed joint seals is 40 degrees Fahrenheit and rising, ambient air temperature. When the manufacturers requirements for minimum installation temperature is greater than 40 degrees, the manufacturers requirements will govern. The joint surfaces shall be completely dry before installing any of the components of the selected joint seal. The selected joint seal cannot be installed immediately after precipitation or if precipitation is forecasted. Joint preparation and installation of the selected preformed joint seal must be done during the same day.

Any discontinuities, projections, divots or other anomalies in the joint opening surfaces that would negatively affect the performance of the preformed joint seal shall be remedied by the Contractor by methods recommended by the manufacturer and as approved by the Engineer.

All vertical faces adjacent to the joint opening shall be sandblasted prior to application of any of the joint seal components. All remnants of the prior existing joint sealing system (rubberized gland, silicone sealant, etc...) shall be removed from the existing headers to remain. Any discontinuities or sharp projections into the plane of the joint shall be ground smooth prior to sandblasting. Whenever abrasive blast cleaning is performed under this Specification, the Contractor shall take adequate measures to ensure that the abrasive blast cleaning will not cause damage to adjacent traffic or other facilities. Traffic will not be allowed to pass over the joint after sandblasting has occurred.

Following sandblasting, the joint's surfaces shall be wiped down or blown clean as recommended by the manufacturer.

The selected joint sealing system shall be installed continuously with no splices in the preformed seal in the roadway section, as recommended by the manufacture of the selected preformed joint seal.

When the sealing operations are completed, the joint opening shall be effectively sealed against infiltration of water. Any seal that does not effectively seal against water shall be removed and replaced at the Contractor's expense.

Treatment at gutterline and curbs/parapets:

At curbs, the preformed joint sealing element shall run continuously from the roadway section through the upturn at the curb and continue as shown on the plans.

At parapets or walls, the joint sealing element shall be upturned at the parapet/wall for a continuous seal through this transition. The treatment for prefabricated piece to transition the bend at the wall depends on the joint seal selected by the Contractor.

Silicoflex by R. J. Watson and V-Seal by Crafcro:

The prefabricated piece shall be fabricated a minimum of 24 hours prior to use. To "make" the bend at the wall is allowed though field splicing of this prefabricated piece shall not be allowed in the roadway section. Parapets and walls shall be sealed for the entire vertical portion and across the top with the sealing element—bends and splices nine inches above the curbline and higher are allowed to be field fabricated.

BEJS by EMSEAL:

Parapets and walls shall be sealed for the entire vertical portion and across the top with the sealing element—bends and splices nine inches below the curbline and the transition into the deck shall be factory fabricated. Roadway splices as well as bends and splices nine inches above the curbline and higher is allowed to be field fabricated.

Method of Measurement: This work will be measured for payment by the number of linear feet of preformed joint sealing system installed. The measurement will be made at the top surface and along the centerline of the joint and shall include all portions of the installation in the

roadway, in the curbs and sidewalk(s), and within parapets and medians. Installation of the Elastomeric trough and PVC pipe shall not be measured separately for payment, but shall be included in the cost of the joint installation.

Basis of Payment: This work will be paid for at the Contract unit price per linear foot for "Preformed Joint Sealing System," complete in place, including all materials, equipment, tools, and labor incidental thereto.

Included in the contract unit price is the pre-installation survey of the existing joint opening and the cost of assistance from a technical representative of the selected joint system.

Included in the contract unit price is installation of Elastomeric trough and PVC pipe. Installation of the steel elements of the Trough is included under the Item "Rehabilitation of Existing Structural Steel".

ITEM #0520907A - REPLACE JOINT SEAL

Description: Work under this item shall consist of furnishing and installing silicone sealant as shown on the plans, as directed by the Engineer, and in accordance with these specifications.

Materials: Silicone sealant used in joint openings shall be a single component non-sag silicone sealant that conforms to the requirements of ASTM D5893.

A Materials Certificate will be required in accordance with Article 1.06.07 certifying the conformance of the silicone sealant to the requirements set forth in this specification.

Each container of product furnished shall be delivered to the job site in the Manufacturer's original sealed container. Each container shall be labeled to include the name of material, Manufacturer's name, and the Manufacturer's lot/batch number. All materials must be stored in accordance with the Manufacturer's written recommendations, in original, unopened containers at or below 32 degrees C (90 deg. F) and or as approved by the Engineer. Materials whose shelf- life has expired shall not be used in the project.

Backer Rod: The backer rod used in conjunction with the joint sealant shall be a closed cell rod with an impervious skin that will not outgas when ruptured. The Contractor shall select one that meets the requirements of ASTM D5249, Type 3.

Construction Methods: The silicone sealant shall be installed at the locations shown on the plans, in accordance with the traffic requirements in the special provisions "Maintenance and Protection of Traffic" and "Prosecution and Progress" or as directed by Engineer.

Tools, equipment, and techniques used to prepare the joints shall be approved by the Engineer and the Manufacturer's technical representative prior to the start of construction.

Sealant shall not be applied to wet or damp concrete or during inclement weather.

Before installation of the silicone sealant, all existing material shall be removed from the joint. The vertical or horizontal surfaces in the expansion joint opening, to which the silicone sealant will bond shall be cleaned of all dust, dirt, debris and other loose materials as recommended by the Manufacturer. Additionally, the bonding surfaces shall be blast cleaned if recommended by the Manufacturer. Following blast cleaning, when required, the surfaces shall again be wiped clean to remove any remaining dust. A backer rod of diameter 25% larger than the joint opening shall then be inserted into the joint opening such that it holds itself firmly in place. Loose fitting backer rods will be rejected. The backer rod shall be recessed below the top surface of the parapet as shown on the plans and as directed by the Engineer. Joints shall be sealed in a neat and workmanlike manner.

Primer, if required by the Manufacturer, shall be applied to the vertical surfaces of the concrete on which the silicone sealant will bond. The primer shall be allowed to cure undisturbed for a minimum of one hour prior to installation of the silicone sealant or longer if required by the Manufacturer or the Engineer.

The mixing and installation of the silicone sealant shall be done in strict conformance with the Manufacturer's written recommendations including the use of static mixing devices if so indicated.

Any portion of the silicone sealant that is punctured, ruptured, debonded, delaminated, or damaged in any other way shall be removed and replaced by the Contractor at no additional cost to the State.

If self-leveling silicone is used for the sealing of vertical joint openings the Contractor must develop means of preventing the silicone from sagging or leaking out during the cure period. Extreme care shall be taken to insure that the sealant is placed in accordance with the manufacturer's recommended thickness requirements.

Method of Measurement: This work will be measured for payment by the number of linear feet the silicone sealant is installed into the final work, measured along the centerline of the roadway joint, along the face of the parapet indicated on the plans or as ordered by the Engineer.

Basis of Payment: This work will be paid for at the contract unit price per linear foot for "Replace Joint Seal", complete in place, including all removal of existing materials, sandblasting where required, and all other materials, equipment, tools, and labor incidental thereto.

Pay Item	Pay Unit
Replace Joint Seal	L.F.

ITEM #0522129A - CLEAN AND LUBRICATE EXISTING BEARINGS

Description:

Work under this item shall consist of cleaning and lubricating of existing bearings as required by the contract plans.

Work under this item shall also include temporary storage of bearings where required by the contract plans.

Materials:

Lubricant: The lubricant shall be an approved penetrating oil as approved by the Engineer. Only fresh lubricants arriving at the work site, in the manufacturer's unopened containers, shall be used to lubricate the bearings.

Construction Methods: Cleaning and lubricating of the bearings shall be at the locations as noted on the contract plans.

Bearings that are to be temporarily stored shall be stored in a safe location, not exposed to the weather, as directed by the Engineer.

Method of Measurement: The work will be measured as each bearing that is cleaned and lubricated. Storing bearings temporarily will not be measured for payment, but is included in the general cost of the work.

Basis of Payment: The unit price bid for each bearing shall include the cost of all labor, material, storage space and equipment necessary to complete the work.

<u>Pay Item</u>	<u>Pay Unit</u>
Clean and Lubricate Existing Bearings	Ea.

ITEM #0602980A - CLEAN AND COAT EXPOSED REINFORCING STEEL

Description: Work under this item shall consist of the removal of loose or delaminated concrete from the underside of existing bridge decks or stay-in-place forms by mechanical methods and the cleaning and coating of exposed reinforcing steel with epoxy resin, as directed by the Engineer.

Materials:

1. Epoxy Resin: The epoxy resin shall be a 2 component, moisture tolerant system with a minimum solids content of 65%, which meets the following requirements:

a) Physical Requirements of (Mixed) Epoxy Resin System: A mixture of both components in the proportions recommended by the manufacturer shall have the following properties and meet the following test requirements:

Viscosity – approximately 2000 centipoises

Pot life – approximately 30 minutes

Modulus of Elasticity – 190 ksi (ASTM D638)

Resistance to Abrasion – 0.03 gm loss after 1000 cycles (Taber Abrader)

Resistance to Cracking – No splitting or loss of bond of a 2.5 mil thickness with 1/8 in mandrel (ASTM D522)

b) Packaging and Marking: The 2 components of the epoxy resin system furnished under these specifications shall be supplied in separate containers, which are non-reactive with the materials contained therein. The size of the container shall be such that the recommended proportions of the final mixture can be obtained by combining 1 container of 1 component with 1 or more whole containers of the other component.

Containers shall be identified as base polymer and reacting system, and shall show the mixing directions and usable temperature range as defined by these specifications. Each container shall be marked with the name of the manufacturer, the lot or batch number, the date of packaging, pigmentation if any, and the quantity contained therein in pounds and gallons.

Printed instructions from the manufacturer for mixing and applying the material shall be included.

Potential hazards shall be so stated on the package in accordance with the Federal Hazardous Products Labeling Act.

2. Sampling: A representative sample of each component sufficient for the test specified shall be taken by a Department representative either from a well-blended bulk lot prior to packaging or by withdrawing 3 fluid ounce samples from no less than 5% by random selection of the containers comprising the lot or shipment. Unless the samples of the same

component taken from containers show evidence of variability, they may be blended into a single composite sample to represent that component. The entire lot of both components may be rejected if samples submitted for testing fail to meet any requirements of this specification.

3. Control of Materials: A Materials Certificate will be required in accordance with Article 1.06.07, certifying the conformance of the epoxy resin to the requirements set forth in this specification.

Construction Methods:

1. Inspection of the Deck Underside: Before any existing concrete is removed from the underside of the deck, the Contractor will provide the Engineer clear access to the underside of the deck. During this time, the Engineer will perform an inspection of the deck and designate areas where concrete removal is required. The inspection will utilize visual assessment as well as sounding for delamination (hammer tapping).

The Contractor must inform the Engineer, in writing, of the date that the bridge deck will be available for inspection operations and the method which will be used for access. Notification shall be given to the Engineer at least 7 days prior to the date so that the Engineer can plan accordingly and verify that the proposed method of access is acceptable.

The Contractor will not perform any work to the deck, until all necessary inspection operations have been performed, unless given permission in writing by the Engineer. The Contractor shall include the time required for inspection in its overall construction schedule and shall include all costs associated with providing access for the Engineer in the bid unit price.

2. Removal of Deteriorated Concrete: All deteriorated concrete designated for removal under this item, shall be removed within the limits shown on the plans and where ordered by the Engineer. The lateral limits of each area of concrete to be removed will be delineated by the Engineer and suitably marked. The Engineer will be sole determiner of what constitutes deteriorated concrete, using sounding methods or other evaluation measures at his discretion.
Hand tools shall be used first to remove loose and hollow sounding concrete. If the concrete cannot be removed with hand tools, the Engineer may authorize the use of pneumatic hammers. The weight of pneumatic hammers, when used shall not exceed 15 pounds. The Contractor shall provide structurally adequate shields approved by the Engineer for protection of waterways, railways, roadways, sidewalks, parking lots or any other areas accessible to the public, which are in the vicinity of the removal operations.
3. Cleaning Exposed Reinforcing Steel: All exposed reinforcing steel on the underside of the deck shall be cleaned and coated, regardless of whether the Contractor exposed it or it was already exposed at the beginning of the Project. The exposed reinforcing steel shall be cleaned of all concrete fragments, loose or powder-like rust, oil, dust, dirt, loose particles, and other bond inhibiting matter. Cleaning methods shall utilize wire brushing at a minimum, but may require more aggressive methods as recommended by the coating

manufacturer or as directed by the Engineer. Cleaning shall be done just prior to coating and shall finish with the cleaned surfaces being wiped down to remove the remaining dust.

4. Coating Exposed Reinforcing Steel: The epoxy resin shall be mixed and applied in accordance with the Manufacturer's instructions. Only the reinforcing steel shall be coated. The surrounding concrete shall not be coated. Care shall be taken to coat all exposed portions of each bar's perimeter and all exposed surfaces where bars overlap or are in contact with each other.

Method of Measurement: This work will be measured for payment by the actual number of linear feet of reinforcing steel cleaned and coated with epoxy resin material and approved by the Engineer. The length of coated reinforcing steel shall be measured along the exposed face of the bar. Where bars are adjacent to each other, the length of each bar shall be measured. No deduction in length shall be made where bars overlap.

Basis of Payment: This work will be paid for at the Contract unit price per linear foot for "Clean and Coat Exposed Reinforcing Steel," complete and accepted, which price shall include all materials, equipment, tools and labor incidental thereto.

Pay Item	Pay Unit
Clean and Coat Exposed Reinforcing Steel	l.f.

ITEM #0603748A - SPECIAL PAINTING TREATMENT

Description: This work includes the re-finishing of ornamental metal railings at Bridge No. 00735. Included are containment, collection, and proper disposal of existing paint finishes and debris.

The Contractor to perform this work shall demonstrate a minimum of five (5) years of successful experience in restoration projects for historic structures. The Contractor shall provide names, dates, and locations of a minimum of three (3) similar projects.

This provision contains recommendations for materials which may be TOXIC. The manufacturer's literature on application techniques, appropriate protection for workers and disposal procedures for materials should be complied with in conjunction with all federal and state regulations. All required Federal and State permits shall be obtained prior to use and/or discharge. Additional information on paint removal and definitions of the terms used within this special provision may be obtained from the latest edition of the "SSPC-GUIDE 6 for Containing Debris Generated during Paint Removal Operations" (SSPC Guide 6).

Materials:

Paint: Shall conform to the requirements of M.07.01 and M.07.02 of the Standard Specifications, Form 816, except as supplemented and amended within this specification.

Coating Systems: Ensure compatibility between each type of coating by using primers, undercoats and finish coats that are produced by the same manufacturer. Follow manufacturers' instructions regarding the preparation of each coating in the system. Materials shall be obtained only from manufacturers who will, if required, send a qualified technical representative to the project site, for the purpose of advising the Contractor of the procedures and precautions for the use of the materials. The following manufacturers' systems are approved for use:

Tnemec Products: Primer: Series 394 PerimePrime
 Finish Coat: Series 27 Typoxy or Series 73 Endura-Shield

Sherwin-Williams Primer: Pro-Cryl Universal Primer
Products: Finish Coat: Sher-Cryl HPA

 Primer: Macropoxy 646
 Finish Coat: Acrolon 218 Urethane

or equal approved by Engineer.

Construction Methods:

Preparation: Examine substrates and conditions under which coatings will be applied for compliance with requirements on applying coatings. Surfaces to receive coatings must be thoroughly dry and free of grease, oil and soiling before coatings are applied.

Containment of Paint Debris: A containment enclosure or enclosures shall be erected to collect the paint debris. This containment enclosure shall be designed and erected to contain, as well as facilitate the collection of debris from the paint removal operations. The containment enclosure shall conform to the requirements found within the SSPC Guide 6. The class of the containment enclosure shall be a minimum of Class 3P or Class 3C depending upon the method of removal, modified to include paragraphs A) through D).

- A) The containment materials shall be air and water impenetrable and fire resistant.
- B) With the exception of the entryways, all seams in the containment enclosure shall be lapped a minimum of 24 inches and shall be tied off at intervals not to exceed 12 inches.
- C) All attachments to the bridge deck shall be sealed to prevent the escape of dust and debris
- D) Drawings and details of the containment enclosure shall be submitted to the Engineer for review prior to any paint removal. Review of the containment enclosure by the Engineer shall in no way relieve the Contractor of his responsibility for the containment enclosure.

Substrate Surface Preparation: Prepare metal elements by removing existing coatings, localized corrosion and scale. Removal methods are to be determined by mockup beginning with the least aggressive methods such as water pressure washing up and proceeding up through commercial blasting until a method is approved by the Engineer and coating Manufacturer's Technical Representative. The intent of the mockup is to determine the least aggressive means of preparing the metal without causing damage to the decorative railing elements.

Do not allow more than 24 hours to pass before applying a primer coat to protect the newly prepared metal. Protect adjacent materials that are not to receive coatings by masking with painter's tape and drop cloths.

Application of Coatings: Apply material by brush, roller, or spray strictly according to the manufacturer's directions. Use brushes best suited for the material being applied. Use rollers as recommended by the manufacturer for the material and texture required.

- Do not apply coatings over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to forming a durable coating film.
- Apply material at the coverage rate recommended by the manufacturer unless otherwise indicated.

- The number of coats and film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Where sanding is required, according to the manufacturer’s directions, sand between applications to produce a smooth, even surface.
- Apply finish coat within 14 days of primer application. Select a primer color that is in the family range as the finish coat, but different enough to discern holiday and incomplete coverage of the finish coats.
- When undercoats or other conditions show through the final coat, apply additional coats until the cured film has a uniform coating finish, color, and appearance. Give special attention to edges, corners, crevices, welds, exposed fasteners, and similar surfaces to ensure that they receive a dry film thickness equivalent to that of flat surfaces.

At the end of each work day, remove rubbish, empty paint cans, and other discarded materials from the site.

Method of Measurement: This work will be paid for on a lump sum basis and will not be measured for payment.

Basis of Payment: This work will be paid for at the contract lump sum price for “Special Painting Treatment” complete in place, which shall include containment, collection and disposal of existing paint and debris, re-finishing of ornamental metal railings, and all labor and incidentals thereto.

<u>Pay Item</u>	<u>Pay Unit</u>
Special Painting Treatment	L.S.

ITEM #0603858A - REHABILITATION OF EXISTING STRUCTURAL STEEL

Description: Work under this item shall consist of the rehabilitation of structural elements at the locations indicated on the plans, or where directed by the Engineer. This work consists of bolting and welding steel plates over deteriorated areas of structural elements in accordance with the plans and this specification. Performing steel repairs will require removing and replacing existing rivets with high strength bolts to facilitate repairs as noted on plans and as directed by the Engineer. This item also includes replacing of bent and deteriorated lacing bars.

Work under this item shall also include removal of pack or laminar rust from existing steel, paint, and all other necessary cleaning of existing steel that is to remain and will be attached to the new structural steel.

Work under this item shall also include removal of existing bent plates and installation of new bent plates for Elastomeric trough as shown on plans.

Work related to preparing surfaces and applying primer coat shall be done in accordance with the requirements outlined in “Abrasive Blast Cleaning and Field Painting of Structure (Site No. 3)”.

Materials: Materials for this work shall conform to Article M.06.02.

See Special Provision “Abrasive Blast Cleaning and Field Painting of Structure (Site No. 3)” for requirements of primer coat.

Galvanizing bent plates for trough shall conform to Article M.06.03.

Construction Methods:

Submittals: For every typical type of repair that is expected, or as directed by the Engineer, the Contractor shall prepare drawings and submit for review based on actual conditions encountered in the field. These submittals shall include field measurements and document any as-built conditions that deviate from the details shown on the plans.

Submissions are also required if a previously approved typical repair needs to be modified due to different conditions at a different location. Submittals shall also include a written description of procedures and design calculations and details for any temporary connections, alternate load paths etc. Submissions should also indicate any loads larger than 1,000 lbs that is likely to be imposed on the structure during the repair process.

At a minimum, submittals are required for the following:

- Arch Rib Flange Repairs, including details at stiffeners and splices
- Arch Rib to column connections

- Column Repairs
- Floorbeam repairs
- Lateral Bracing Repairs (all types)
- Lacing Bar repairs
- Trough Details under deck joints
- Column to Floorbeam connections

General: Arc gouging, flame cutting, or welding onto the existing steel will not be allowed.

Field Welders: All field welders, field welding operators, and field tackers shall possess a valid welder certification card issued by the Department's Division of Materials Testing. If such person has not been engaged in welding operations on a Department project or project acceptable to the Department within a period of six months, or if he cannot produce an approved welding certificate dated within the previous twelve months from a welding agency acceptable to the Engineer, he shall be required to re-qualify through examination. The Engineer may require re-qualification of anyone whose quality of work he questions.

Welding: All work shall be performed in accordance with ANSI/AASHTO/AWS D1.5 – Bridge Welding Code.

Cleaning of Contact (Faying) Surfaces: All pack or laminar rust shall be removed from existing steel members that are to remain and will be attached to the new structural steel. Impacted rust that cannot be removed shall be cleaned as best possible then coated with penetrating sealer. Burrs or other irregularities that prevent solid seating of the adjoining surfaces shall be removed. At the time of assembly, all faying surfaces shall be free of scale, except tight mill scale, and shall be free of dirt, cutting oil, or other foreign material. The purpose of this requirement is to ensure that all contact surfaces between existing and new steel will be in firm contact without any deleterious materials interfering with the contact surfaces.

Method of Measurement: This item will be measured for payment by the net weight of structural steel installed and accepted. The net weight shall be determined by computation as described in Sub Article 6.03.04-1.

Basis of Payment: This work shall be paid for at the contract unit price per hundred weight for "Rehabilitation of Existing Structural Steel" complete and accepted which price shall include the cost of all materials, tools, equipment and labor incidental to cleaning of the girder surfaces, removal of rust, preparation of surfaces, applying primer as required, t installation of steel plates, welding and weld inspection, and all other tools, labor, and materials incidental thereto.

Installation of primer in locations not affected by steel repairs and subsequent topcoats shall not be included under this item but shall be paid for under the item, "Abrasive Blast Cleaning and Field Painting of Structure (Site No. 3)".

ITEM #0603926A - ABRASIVE BLAST CLEANING AND FIELD PAINTING OF STRUCTURE (SITE NO. 3)

Description: Work under this item shall consist of surface preparation and field painting of the steel components of structures as shown on the plans and as directed by the Engineer.

All structural steel, except those specific components listed below or on the plans, shall be abrasive blast cleaned and painted with a 3-coat system.

Locations of the structure that have rust/pack rust after surfaces have been prepared in accordance with these specifications shall receive a stripe coat of an approved penetrating sealer. Locations of the structure that received the penetrating sealer stripe coat and locations that could potentially experience future water infiltration (joints between plates of built-up members) shall receive a stripe coat of an approved epoxy patching and surfacing compound followed by the intermediate and top coats noted in this special provision.

Components to be painted are as shown on the plans and may include but not be limited to the following: beams and girders, arch ribs, lacing bars, columns, diaphragms and cross frames, steel bearings, the inside surfaces of box girders, scuppers, drainage pipes and troughs, State-owned utility conduits, structural steel utility supports, non-galvanized structure mounted sign supports, steel grid decks, and all other metal components that are an integral part of the bridge system.

Privately-owned utilities, bridge rails, stay-in-place forms, fences, elastomeric bearing pads and bronze components shall be protected from damage by surface preparation and painting operations and shall not be painted.

Tabulated data for the structure(s), including the Federal Standard 595 Color Number for the top coat, are listed in tables on the plans. The estimated surface area of structural steel to be painted on each structure is given as a guide only, and is not guaranteed to be accurate. Bidders shall examine the listed structures and shall make their own determinations as to the work involved and conditions to be encountered.

Submittals: A minimum of 20 calendar days before starting any surface preparation and coating application work, the painting firm shall submit the following to the Engineer for acceptance:

1. A copy of the firm's written Quality Control Program used to control the quality of surface preparation and coating application including, but not limited to, ambient conditions, surface cleanliness and profile, coating mixing, dry film thickness, and final film continuity.
2. A copy of the firm's written surface preparation and application procedures. This written program must contain a description of the equipment that will be used for removal of laminar and stratified rust, for surface preparation, including the remediation of soluble salts, and for paint mixing and application, including stripe coating. Coating repair procedures

shall be included.

3. The qualifications, references and documentation of the personnel managing and performing the Quality Control Program, including a detailed description of the firm's enforcement procedures and the authority of personnel.
4. Containment plans (paint removal/collection of debris, surface preparation, coating applications with heat)
5. If the application of heat is proposed for coating application purposes, provide information on the heat containment and procedures that will be used, with data sheets for the equipment. Note: If heat is used for coating operations, the heat and containment must be maintained to provide the required temperatures for the duration of the cure period.
6. Proof of SSPC-QP1 qualifications, CAS-certification(s) and QP2 qualifications, as applicable.
7. Proof that the finish coat complies with the color and gloss retention performance criteria of SSPC Paint 36, Level 3, for accelerated weathering.
8. Coating product information, including coating manufacturer, product name, application instructions, technical data, MSDS and color chips.
9. Abrasive product information, including abrasive manufacturer, product name, technical data, and MSDS.
10. Touch-up and repair procedures, including methods and materials.

The Contractor shall not begin any paint removal Work until the Engineer has accepted the submittals. The Contractor shall not construe Engineer acceptance of the submittals to imply approval of any particular method or sequence for conducting the Work, or for addressing health and safety concerns. Acceptance of the programs does not relieve the Contractor from the responsibility to conduct the Work in strict accordance with the requirements of Federal, State, or local regulations, this specification, or to adequately protect the health and safety of all workers involved in the Project and any members of the public who may be affected by the Project. The Contractor remains solely responsible for the adequacy and completeness of the programs and work practices, and adherence to them.

Materials: The materials for the coating system for this work shall meet the requirements of Section M07.02 and the following:

The coating system shall be a **3-coat system** selected by the Contractor and accepted by the Engineer. The system shall be on the NEPCOAT Qualified Products List A (Inorganic Zinc Rich Primer / Epoxy or Urethane Intermediate / Aliphatic Urethane Finish) or List B (Organic Zinc Rich Primer / Epoxy or Urethane Intermediate / Aliphatic Urethane Finish) for Protective Coatings for New and 100% Bare Existing Steel for Bridges.

Note: The List B Carboline Company system that specifies Carboguard 888 is not eligible for use under this special provision at this time.

All materials for the complete coating system, including the penetrating sealer and the epoxy patching and surfacing compound shall be furnished by the same coating material manufacturer with no subcontracted manufacturing allowed. Intermixing of materials within and between

coating systems will not be permitted. Thinning of paint shall conform to the manufacturer's written recommendations. All components of the coating system and the mixed paint shall comply with the Emission Standards for Volatile Organic Compounds (VOC) stated in the Connecticut Department of Energy and Environmental Protection's Administration Regulation for the Abatement of Air Pollution, Section 22a-174-20(s).

Penetrating Sealer shall be Sherwin-Williams Macropoxy 920 Pre-Prime penetrating epoxy primer or approved equal that is compatible with the chosen paint system.

Epoxy Patching and Surfacing compound shall be Sherwin-Williams Steel-Seam FT910 Epoxy Patching and Surfacing Compound or approved equal that is compatible with the chosen paint system.

The top coat shall meet the color and gloss retention performance criteria of SSPC Paint 36, Level 3, for accelerated weathering. After 2000 hours of accelerated weathering in accordance with ASTM D4587, the color change (ASTM D 2244) shall be less than 2.0 ΔE^* with a loss of gloss (ASTM D 523) less than 30. With the submittals, the Contractor shall provide the Engineer with proof that the finish coat complies with the above criteria.

The abrasive media for blast cleaning shall be recyclable steel grit.

Control of Materials: A Materials Certificate will be required for the selected paint system in accordance with Article 1.06.07, confirming the conformance of the paint to the requirements set forth in these specifications.

Note: If any of the above or following stipulated Contract specifications differ from those of the manufacturer's recommended procedures or ranges, the more restrictive of the requirements shall be adhered to unless directed by the Engineer in writing.

Construction Methods:

Contractor - Subcontractor Qualifications:

Contractors and subcontractors doing this work are required to be certified by the SSPC Painting Contractor Certification Program (PCCP) to QP-1 entitled "Standard Procedure for Evaluating Qualifications of Painting Contractors: Field Application to Complex Structures." When the work involves the disturbance of lead-containing paint, the Contractor and subcontractor are also required to be certified to SSPC QP-2 "Standard Procedure for Evaluating the Qualifications of Painting Contractors to Remove Hazardous Paint."

Contractors and subcontractors are required to have at least one (1) **Coating Application Specialist (CAS) (SSPC ACS/NACE No. 13)**-certified (Level II-Interim Status-Minimal) craft-worker. CAS-certified (Level II-Interim Status-Minimal) craft-worker(s) are required for all crews/craft-workers up to four (4) crew members. For each crew larger than four (4), an additional CAS-certified (Level II-Interim Status-Minimal) craft-worker shall be present on each

painting/blasting crew during blast cleaning and spray application (Atmospheric and Immersion Service) operations. A crew-member is a person who is on the job performing hand-held nozzle blast cleaning and/or spray application of protective coatings on a steel structure. The certification(s) must be kept current for the duration of the Project work. If a Contractor's, subcontractor's or any craft-worker's certification expires, the firm will not be allowed to do any work on this item until the certification is reissued.

Requests for extension of time for any delay to the completion of the Project due to an inactive certification will not be considered, and liquidated damages will apply. In addition, if any recoat times are exceeded, the affected areas shall be abrasive blast cleaned to SSPC-SP 10 and coatings reapplied in accordance with these specifications at no additional cost to the State. At the option of the Engineer, if such a delay will adversely impact the successful and timely completion of the Project, the Department may require the Contractor to engage another SSPC-certified firm to do the painting work at the Contractor's expense.

Quality Control Inspections: The Contractor shall perform first line, in-process Quality Control (QC) inspections. The Contractor shall implement a Quality Control Program accepted by the Engineer, including written daily reports, that ensures that the work accomplished complies with these specifications. Copies of these reports shall be provided daily to the Engineer. Contractor QC inspections shall include, but not be limited to the following:

- Suitability of protective coverings and containments
- Ambient conditions
- Surface preparation (solvent cleaning, hand/power tool or abrasive blast cleaning)
- Coating application (mixing, thinning, and wet/dry film thickness)
- Recoat times and cleanliness between coats
- Coating continuity (freedom from runs, sags, overspray, dryspray, pinholes, shadow-through, skips, misses)
- Final film acceptance

The personnel managing and performing the quality control program shall be NACE Certified Coating Inspector(s) (successfully completed Sessions I, II, III and Peer Review) or shall provide evidence of successful inspection of 3 projects of similar size and scope that have been completed in the last 2 years. References shall include the name, address, and telephone number of a contact person employed by the bridge owner. The personnel performing the quality control tests shall be trained in the use of the quality control instruments. Documentation of training shall be provided. These personnel shall not perform surface preparation and painting.

Test Equipment and Materials: The Contractor shall furnish the following new test equipment and materials for use by the QC Inspector:

1. Two (2) PTC Surface Temperature Thermometers
2. Psychron 566 Psychrometer (Battery Operated) with two (2) sets of batteries or a Bacharach Sling Psychrometer
3. U.S. Weather Bureau Psychrometric Tables
4. Hypodermic Needle Pressure Gage for nozzle pressure tests.

5. SSPC Visual Standards VIS 1, VIS 3, and/or VIS 4, as applicable.
6. Testex Spring Micrometer
7. Testex Press-O-Film Replica Tape, one (1) roll, 100 pieces each, of coarse and extra-coarse per bridge span, or as specified by the Engineer.
8. Wet film thickness gage
9. PosiTest, Mikrotest or Elcometer Dry Film Thickness Gauge (FM)
10. SSPC Type 2 Dry Film Thickness Gauge per PA2
11. NIST (NBS) Calibration Standards Range: 0 – 39 mils

Quality Assurance Inspections: The Engineer may conduct Quality Assurance (QA) observations of any or all phases of the work. The presence or activity of Engineer inspections in no way relieves the Contractor of the responsibility to provide all necessary daily Quality Control inspections of its own and to comply with all requirements of this Specification.

The Contractor shall facilitate the Engineer's inspections as required, including allowing ample time for the inspections and providing suitable lighting (50 foot candles minimum at the surface as defined later in this specification). The Contractor shall furnish, erect and move scaffolding or other mechanical equipment to permit inspection and close observation of all surfaces to be cleaned and painted. This equipment shall be provided during all phases of the work. The Contractor shall notify the Engineer in advance of plans to remove staging used in cleaning and painting operations in order to allow for inspection. The QA inspection will be performed with the QA inspector's equipment when verifying the Contractor's test results in the field.

Safety: All Contractor activities associated with the coating work described and specified herein shall be conducted in accordance with all applicable Federal (OSHA) and State of Connecticut safety regulations, and SSPC-PA Guide 3 entitled "A Guide to Safety in Paint Application."

Ambient Conditions: Surface preparation and coating application work shall only be done inside a containment enclosure as specified herein. Surface preparation or coating work shall be performed inside the containment enclosure meeting the following :

- The relative humidity is at or below 90%.
- The substrate is not damp, or covered by frost or ice.
- The surface temperature and air temperature are between 50° F and 100° F.
- The surface temperatures of the steel and air are more than 5° F above the dewpoint temperature, as determined by a surface temperature thermometer and electric or sling psychrometer.

If the requirements of the coating manufacturer differ from the ranges provided above, comply with the most restrictive requirements unless directed otherwise by the Engineer in writing.

Protective Coverings: The Contractor shall protect property, pedestrians, vehicular, and other traffic upon, underneath, or near the bridge, and all portions of the bridge superstructure and substructure against abrasive blast cleaning damage or disfigurement from splatters, splashes, or

spray of paint or paint materials. All coating overspray, drips and spills shall be contained. Maintain the integrity and security of all protective coverings and containment materials throughout the entire Project.

Any paint chips, paint removal media (e.g., abrasives), coating or solvent that has escaped the Contractor's containment enclosure shall be cleaned up immediately. For bridges over water, the Contractor shall have on Site a sufficient quantity of spill containment boom and pads to contain a spill. The length of containment boom on site shall be at least equal to twice the length of the active work Site over the water.

Observed Steel Defects: If significant deficiencies, such as cracks or section losses, are found during cleaning or coating operations, the Contractor shall immediately notify the Engineer as to their extent. Significant deficiencies include the following:

- a) Cracks in any part of the superstructure.
- b) Section loss more than 1/8 inch of flange thickness in a location subjected to moment and/or axial force.
 - a. In floorbeams
 - b. In spandrel columns
 - c. In the whole arc span of the arch rib
 - d. In the lateral bracings and diagonal bracings between arch ribs
- c) Section loss more than 1/8 inch of plate thickness at connection areas
 - e. Gusset plates, shim plates, base plates, bent plates etc.
- d) Section loss more than 1/8 inch of web thickness in a location subjected to shear force
 - f. Areas in arch rib and floorbeams adjacent to spandrel columns.
- e) Section loss more than 1/8 inch of pin element and cast steel shoe at arch supports.

Heating Devices: The Contractor may use heating devices to obtain and maintain a condition within the containment enclosure that is suitable for surface preparation and painting application. For painting applications, the required conditions must be maintained for the duration of the cure period. Heating devices shall be limited to gas- or oil-fired indirect air heaters in which the combustion products are discharged separately from the forced airstream to an area outside the containment enclosure. The heating devices must be configured so as not to form condensation on cold surfaces or cause rust-back and must be automatically controlled. Information describing the proposed heating devices and the proposed heating procedures shall be provided a minimum of 20 days in advance for Engineer acceptance.

Lighting Requirements: A minimum illumination level of 20 foot-candles shall be provided throughout the inside of the containment enclosure during surface preparation and coating application work. A minimum illumination level of 50 foot-candles shall be provided at the location of the specific work task and for inspection. All lighting fixtures and related connectors

located inside the containment enclosure must be explosion proof and shall be UL listed.

Material Storage: The Contractor shall provide a suitable facility for the storage of paint that complies with all Federal and State laws and regulations.

This facility shall provide protection from the elements and ensure that the paint is stored at temperatures within the more stringent of (1) the manufacturer's written recommended temperatures, or (2) between 40° F and 100° F. If paint application takes place in conditions that require heating of the containment, then the temperature of the stored paint shall be maintained at a similar temperature. Storage of paint shall be in reasonable proximity to the painting locations. The Engineer shall be provided access to the stored paint for inspection and to witness removal of the materials. The Contractor's facility for the storage of paint shall be subject to the approval of the Engineer.

Equipment: All equipment used in surface preparation and removal of debris, such as hoses, hoppers, recycling and vacuum machines that the Contractor brings to the Site, shall be clean and free of any prior debris.

Spray equipment, brushes and rollers used in application of coatings shall be sized sufficiently and be in proper working order to accomplish the work according to the manufacturer's written recommendations.

Compressed Air: All compressed air sources shall have oil and moisture separators, attached and functional, and properly designed and sized. The compressed air sources shall deliver air to the blast nozzle, for blowing down the surfaces, or for conventional spray application that is free of oil and moisture and of sufficient pressure to accomplish the associated work efficiently and effectively. The tanks on the air compressor and moisture separator shall be drained at the end of each workday. The compressed air source shall produce a minimum pressure of 90 psi at the nozzle during abrasive blast cleaning.

The Contractor shall verify that the compressed air is free of moisture and oil contamination in accordance with the requirements of ASTM D4285. The tests shall be conducted at least once every 4 hours for each compressor system in operation. Sufficient freedom from oil and moisture is confirmed if soiling or discoloration is not visible on the paper. If air contamination is evidenced, the Contractor shall change filters, clean traps, add moisture separations or filters, or make other adjustments as necessary to achieve clean, dry, air.

Test Sections: Prior to surface preparation, the Contractor shall prepare a test section(s) on each structure to be painted in a location(s) that the Engineer considers to be representative of the existing surface condition and steel type for the structure as a whole. The test section(s) shall be prepared using the same equipment, materials and procedures as the production operations. The Contractor shall prepare the test section(s) to the specified level according to the appropriate SSPC written specifications and visual standards. The written requirements of the specification prevail in the event of a conflict with the SSPC visual standards. Only after a test section area has been approved shall the Contractor proceed with surface preparation operations. The test

section(s) shall cover approximately 10 square feet each. Additional compensation will not be allowed the Contractor for preparation of test sections.

For the production cleaning operations, the specifications and written definitions, the test section(s), and the SSPC visual standards shall be used in that order for determining compliance with the Contract requirements.

Surface Preparation:

1 – Laminar and Stratified Rust: All laminar and stratified rust or corrosion products that have formed on any area of the existing steel surfaces and accessible rust formed along edges of connected plates or shapes of structural steel shall be removed. The tools used to remove these corrosion products shall be identified in the submittals and accepted by the Engineer. If the surface preparation or removal of rust results in nicks or gouges, the work will be suspended. The Contractor shall demonstrate that the necessary adjustments have been made to prevent a reoccurrence of the damage prior to resuming work.

2 – Near White Metal Blast Cleaning (SSPC-SP10): Steel surfaces shall be cleaned by the specified methods described in the SSPC Steel Structures Painting Manual, Volume 2 - Systems and Specifications, latest edition. The structural steel shall be abrasive blast cleaned according to SSPC-SP 10 “Near White Blast Cleaning.” Before and after blast cleaning, all dissolvable foreign matter, such as oil, grease, and dust shall be removed by wiping or scrubbing the surface with rags or brushes wetted with solvent in accordance with the provisions of SSPC-SP 1 “Solvent Cleaning.” Clean solvent and clean rags or brushes shall be used for the final wiping.

All foreign materials such as dirt, dust, rust scale, sand, bird droppings, and all materials loosened by abrasive blasting operations shall be completely removed by vacuuming before any painting operations are begun.

The cleaned surface shall be accepted by the Engineer before any painting. If the surface is determined to meet the requirements of SSPC-SP 10, painting operations can commence. The prime coat shall be applied to the steel before the end of the day that preparation was performed and before the formation of any flash rusting or rerusting of the steel. Flash rusting or rerusting of the surface is unacceptable and requires additional blast cleaning prior to painting.

Failure of the Contractor to prepare and clean the surfaces to be painted according to these specifications shall be cause for rejection by the Engineer. All surfaces that are rejected shall be re-cleaned to the satisfaction of the Engineer in accordance with these specifications, at no additional cost to the State.

3 – Steel Grit Abrasive Mix: The recyclable steel grit abrasive mix shall be maintained and monitored such that the final surface profile is within the range specified elsewhere in these specifications.

Before each reuse, the recyclable steel grit abrasive shall be cleaned of millscale, rust, paint,

and other contaminants by an abrasive reclaimer.

On a weekly basis during blast cleaning operations, the Contractor shall verify that the recycled steel grit abrasives meet the requirements of SSPC-AB2. If the abrasive fails the testing, all abrasive blast cleaning operations shall be suspended. The abrasive reclaimer shall be repaired and another abrasive sample will be required for testing after grit recovery and reclassification. For test results within the acceptable limits, abrasive blast cleaning may resume. Test results outside of the acceptable limits will require additional equipment repairs or replacement at no cost to the State. If additional repairs were performed, another sample will be required for testing after grit recovery and reclassification. If the test results continue to remain outside of the acceptable limits, the Contractor shall replace the abrasive reclaimer at no cost to the State.

4 - Surface Profile: The specified height of the steel surface profile is 1-3 mils and shall be uniform. Verification of the profile height will be done with Testex Replica Tape. A surface profile correction factor will be measured according to SSPC-PA 2, Section 2.2.4 with the dry film thickness gauge.

Note: Chemical Stripping will not be permitted.

Painting Operation:

1 - General: All coatings shall be supplied in sealed containers bearing the manufacturer's name, product designation, batch number and mixing/thinning instructions. Leaking containers shall not be used. Storage, opening, mixing, thinning and application of coating materials shall be accomplished in strict accordance with the written requirements and procedures published by the respective coating material manufacturer and supplier. In the event of a conflict, the Contractor shall notify the Engineer in writing, and unless directed otherwise in writing, the requirements of this specification shall prevail. The Contractor shall always have, at the Project Site, the current copies of all material safety data sheets (MSDS), technical data, recommendations and procedures published by the coating manufacturer for the coating materials.

2 - Paint Mixing and Thinning: Thinning shall be performed only to the extent allowed by the manufacturer's written instructions, and only with the manufacturer's approved thinner. In no case shall thinning be permitted that would cause the coating to exceed the local VOC restrictions. For multiple component paints, only complete kits shall be mixed and used. Partial mixing is not allowed.

The ingredients in the containers of paint shall be thoroughly mixed by mechanical power mixers in the original containers, or as directed by the manufacturer, before use or mixing with other containers of paint. The paint shall be mixed in a manner that will break up all lumps, completely disperse pigment and result in a uniform composition. Paint shall be carefully examined after mixing for uniformity and to verify that no unmixed pigment remains on the bottom of the container. Excessive skinning or partial hardening due to improper or prolonged

storage will be cause for rejection of the paint, even though it may have been previously inspected and accepted.

Multiple component coatings shall be discarded after the expiration of the pot life. Single component paint shall not remain in spray pots, painter's buckets, or similar containers overnight. It shall be stored in a covered container and remixed before use.

The Engineer reserves the right to sample field paint (individual components or the mixed material) and have it analyzed. If the paint does not meet the product requirements due to excessive thinning or because of other field problems, the coating shall be removed from that section of the structure and replaced as directed by the Engineer.

3 – Methods of Application: All applicators of the specified coating material shall show proficiency on a test panel, or a portion of the structure as selected by the Engineer, to the satisfaction of the Engineer before commencing full-scale application.

The preferred method for coating application shall be by airless spray equipment. For stripping and for application in areas where complex shapes or tight clearances will not allow spray application, the Contractor shall apply the coating material by appropriately designed and constructed rollers and brushes.

4 – Recoat Times: The recoat time of the primer, intermediate and top coat shall not deviate from the written recommendation of the manufacturer or the times specified in these specifications, complying with the most restrictive requirements unless directed otherwise by the Engineer in writing. If any individual time is exceeded, the affected areas shall be abrasive blast cleaned to SSPC-SP 10 and coatings reapplied in accordance with these specifications at no additional cost to the State.

5 – Film Continuity: All applied coatings shall exhibit no running, streaking, sagging, wrinkling, holidays, pinholes, top coat color or gloss variation, or other film defects. Failure of the Contractor to apply coatings that are free of film defects shall be cause for rejection by the Engineer. All coatings rejected shall be repaired to the satisfaction of the Engineer, at no additional cost to the State. Before doing any coating repair work, the Contractor shall submit to the Engineer for approval the procedures that will be used to repair the coating.

6 - Technical Advisor: It is mandatory that the Contractor obtain the services of a qualified technical advisor employed by the coating manufacturer. This advisor shall be familiar with the technical properties of the coating products and proper application methods. The technical advisor shall assist the Engineer and the Contractor in establishing correct application methods for the complete coating system. He/she shall be present at the work Site before the opening of the material containers and shall remain at the Site until the Engineer is satisfied that the Contractor's personnel have mastered the proper handling, mixing and application of the material. The Engineer may call the technical advisor back to the Site if there are concerns that the Contractor is not handling, mixing or applying the material correctly.

7 - Containment Plan: For each individual Site, the Contractor shall submit a plan of

containment to the Engineer for acceptance. The plan, as outlined in other Contract item special provisions, shall be submitted 20 days before commencing painting operations. The prime coat shall be applied within the same containment used for abrasive blast cleaning. After prime coat application, the minimum containment enclosure for the intermediate and top coat shall conform to the requirements of SSPC Guide 6, Class 3A and the following:

- Components of the containment system must be made from flame retardant materials.
- Tarpaulin material shall be clean and impermeable to air and water.
- Joints shall be fully sealed except for entryways.
- Entryways shall use multiple flap overlapping door tarps to minimize dust escape through the entryway.
- All mists or dust shall be filtered with collection equipment.
- For truss bridges, a ceiling shall also be included.

8 - Prime Coat Application: All prepared surfaces shall be cleaned by vacuuming to remove dust, remaining debris, and other surface contaminants before coating. Such surfaces shall then be sprayed, brushed or rolled within the specified abrasive blast cleaning containment enclosure with the specified primer material before the end of the day or before any visible rust-back occurs. If rust-back occurs, affected surfaces shall be re-cleaned to the satisfaction of the Engineer in accordance with these specifications, at no additional cost to the State.

All plate and shape edges, plate seams, back to back angle seams, pitted steel, and other sharp discontinuities shall be hand-stripped with a brush in the longitudinal direction with the primer. Bolted connections shall also have all bolt heads and nuts hand-stripped in a circular brush motion with the primer material. Stripe coats shall be applied before or after the full prime coat application. The prime coat material used for hand-stripping shall be tinted to distinguish it from material used for full prime coat application.

The zinc rich primer shall be applied to dry surfaces within the more restrictive temperature range (both steel and air) as specified in the manufacturer's written application instructions or between 50° F and 100° F, unless directed otherwise by the Engineer in writing. The dry film thickness shall be according to the manufacturer's written instructions in effect at the time that the product was tested for NEPCOAT. The dry film thickness will be checked for compliance by measuring above the peaks of the substrate profile per the guidelines of SSPC-PA 2.

The dry primer shall be free of all surface and embedded contamination and dry spray.

The penetrating sealer shall be applied to all joints with rust/pack rust between built-up members as shown on the plans and as directed by the Engineer. The penetrating sealer shall be applied as per the manufacturer's recommendations and be fully cured per the manufacturer's recommendations prior to the application of the epoxy surface and patching compound.

The epoxy surface and patching compound shall be applied to all joints between built-up members as shown on the plans (including those joints with pack rust that received the penetrating sealer) and as directed by the Engineer. The epoxy surface and patching compound

shall be applied and fully cured as per the manufacturer's recommendations before any subsequent coats are applied.

9 - Intermediate Coat Application: When the primer, penetrating sealer and the epoxy surface and patching compound have cured per the manufacturer's recommendations (not to exceed 30 days), all previously coated surfaces shall receive the intermediate coat. The cured and dry primer coat and epoxy surface stripe coat shall be clean and free of all surface and embedded contamination and dry-spray. If it is not clean and free of all contamination, and dry-spray, the surfaces shall be cleaned by using clean rags or brushes to water wipe, solvent wipe, or detergent wash and rinse. Power washing is not allowed. Temperature ranges (both steel and air) shall be the more restrictive of that specified in the manufacturer's written application instructions or between 50° F and 100° F, unless directed otherwise by the Engineer in writing. The dry film thickness shall be according to the manufacturer's written instructions in effect at the time that the product was tested for NEPCOAT. The intermediate coat shall be of a contrasting color to the prime and topcoat colors. The dry film thickness will be checked for compliance per the guidelines of SSPC-PA 2.

10 - Top Coat Application: When the intermediate coat has cured per the manufacturer's written recommendations (not to exceed 10 days), all previously coated surfaces shall receive the top coat. The cured and dry intermediate coat shall be clean and free of all surface and embedded contamination and dry-spray. If it is not clean and free of all contamination, and dry-spray, the surfaces shall be cleaned by using clean rags or brushes to water wipe, solvent wipe, or detergent wash and rinse. Power washing is not allowed. Temperature ranges (both steel and air) shall be the more restrictive of that specified in the manufacturer's written application instructions or between 50° F and 100° F, unless directed otherwise by the Engineer in writing. The dry film thickness shall be according to the manufacturer's written instructions in effect at the time that the product was tested for NEPCOAT.

11 - Date of Completion: The word "PAINTED" followed by the month and year the painting of each structure was completed, along with the manufacturer's abbreviations for each of the 3 coats, shall be stenciled at an inconspicuous location as determined by the Engineer in three (3) inch high block letters near each abutment, to be clearly visible from the ground below. In order to ensure uniformity, abbreviations shall be approved by the Engineer prior to application of the stenciled information.

Method of Measurement: This item, being paid for on a lump sum basis for each site number, will not be measured for payment.

Basis of Payment: This work will be paid for at the Contract lump sum price for "Abrasive Blast Cleaning and Field Painting of Structure (Site No. 3)," which price shall include all materials, equipment, painting overspray containment enclosure, heating devices, tools, labor, and services of the technical advisor. No direct payment will be made for the cost of storage or hauling the paint and other materials to and from the bridge site(s), but the cost thereof shall be included in the lump sum price as noted above.

Pay Item
Abrasive Blast Cleaning and Field Painting
of Structure (Site No. 3)

Pay Unit
L.S.

ITEM #0605008A - ARCHITECTURAL TILES

Description: This item shall consist of the fabrication and installation of Architectural Tiles of the hereinafter specified quality, applied to the prepared surfaces of the concrete structures as ornamentation. This item shall also include proper surface preparation of concrete to achieve the desired finished product. It shall be constructed to the dimensions indicated on the plans or as ordered by the engineer and in accordance with these specifications

Materials:

Architectural Tiles shall be produced from one of the following manufacturers or an approved equal by the Conservator:

Arim, Inc. | USA
154 West Edsall Blvd.
Palisades Park, NJ 07650
201-645-1814

Heritage Glass, Inc.
130 West 700 South, Building E
Smithfield, UT 84335
435-563-5585

Architectural Tiles shall be composed of pigmented cement, fine aggregate, and glass aggregate as defined below:

Portland cement shall conform to the requirements of section M.03.01-3

Dry pigments shall be synthetic mineral oxides conforming to ASTM C979 and shall be a maximum 2% by weight of cement.

Fine aggregates shall conform to the requirements of section M.03.01-2

Glass aggregate shall be vitreous red reflectolite and shall be no larger than the 3/8" sieve.

Adhesive shall be chemical anchoring material conforming to the requirements of Section M.03.07

Construction Methods:

Surface Preparation:

The surfaces which are to receive the architectural panels shall be scarified prior to installation.

ITEM #0605008A

Mockup:

Prior to fabrication of the mockup the contractor shall submit samples of the glass aggregate to be approved by the Conservator. The contractor shall also provide (2)-8x8 Architectural Tile samples and (2)-4x4 samples of the pigmented mix to be approved by the Conservator prior to fabrication of the Architectural Tiles. Should additional samples be required due to rejection of the originals, they shall be provided at no additional cost to the state. The surface of the tiles shall be predominantly exposed glass aggregate with minimal pigmented concrete.

Installation:

Installation of Architectural Tiles shall consist of applying chemical adhesive to the prepared surface and the back of panels to be placed in the locations as specified in the plans. Surrounding areas shall be masked to prevent drips of adhesive. Any adhesive which does fall on the existing structure shall be completely removed to the approval of the conservator. Architectural Tiles shall be installed prior to application the bridge coating.

Method of Measurement:

The quantity of architectural panels shall be the actual number of square feet of the face area of the panels completed within the neat lines as shown on the plans.

Basis of Payment:

Architectural Tiles will be paid for at the contract unit price per square feet, complete in place, which price shall include all equipment, tools and labor incidental thereto including surface preparation, installation of panels, and all materials.

ITEM #0707009A - MEMBRANE WATERPROOFING (COLD LIQUID ELASTOMERIC)

Description: Work under this item consists of furnishing and installing a seamless elastomeric waterproofing membrane system applied to a concrete or steel surface as shown on the plans, in accordance with this specification and as directed by the Engineer. Work shall also include conditioning of the surface to be coated and all quality-control testing noted herein.

The completed membrane system shall be comprised of a primer coat followed by the membrane coating which is applied in one or two layers for a minimum total thickness of 80 mil (2 mm), an additional 40 mil (1mm) membrane layer with aggregate broadcast into the material while still wet, and a bond coat of bitumen-based adhesive material.

Materials: The Contractor shall select a waterproofing membrane system from the Department's current Qualified Product List (QPL) for Spray-Applied Membrane Waterproofing System. All materials incorporated in the works shall meet the Manufacturer's specification for the chosen system. The Engineer will reject any system that is not on the QPL.

Materials Certificate: The Contractor shall submit to the Engineer a Materials Certificate for the primer and membrane and bond coat material in accordance with the requirements of Article 1.06.07.

Construction Methods: At least ten days prior to installation of the membrane system, the Contractor shall submit to the Engineer, the manufacturer's recommended procedure for preparing the deck surface, pre-treatment or preparing at cracks and gaps, treatment at curbs, vertical surfaces or discontinuities, applying the primer and membrane, and placing of aggregated coat. Procedures shall also include recommended repairs of system non-compliant issues identified during application. The system shall be applied to the prepared area(s) as defined in the plans strictly in accordance with the Manufacturer's recommendations.

A technical representative, in the direct employ of the manufacturer, shall be present on-site immediately prior to and during application of the membrane. The representative shall inspect and approve the surface prior to priming, and provide guidance on the handling, mixing and addition of components and observe application of the primer and membrane. The representative shall perform all required quality-control testing and remain on the Project site until the membrane has fully cured.

All quality-control testing, including verbal direction or observations on the day of the installation, shall be recorded and submitted to the Engineer for inclusion in the Project's records. A submittal of the quality-control testing data shall be received by project personnel prior to any paving over the finished membrane or within 24 hours following completion of any staged portion of the work.

1. **Applicator Approval:** The Contractor's membrane Applicator shall be fully trained and licensed by the membrane manufacturer and shall have successfully completed at least three spray membrane projects in the past five years. The Contractor shall furnish references from those projects, including names of contact persons and the names, addresses and phone numbers of persons who supervised the projects. This information shall be submitted to the Engineer prior to the start of construction. The Engineer shall have sole authority to determine the adequacy and compliance of the submitted information. Inadequate proof of ability to perform the work will be grounds to reject proposed applicators.

2. **Job Conditions:**

(a) **Environmental Requirements:** Air and substrate temperatures shall be between 32°F (0°C) and 104°F (40°C) providing the substrate is above the dew point. Outside of this range, the Manufacturer shall be consulted.

The Applicator shall be provided with adequate disposal facilities for non hazardous waste generated during installation of the membrane system. The applicator shall follow safety instructions regarding respirators and safety equipment.

(b) **Safety Requirements:** All open flames and spark producing equipment shall be removed from the work area prior to commencement of application.

"No Smoking" signs shall be visibly posted at the job site during application of the membrane waterproofing.

Personnel not involved in membrane application shall be kept out of the work area.

3. **Delivery, Storage and Handling:**

(a) **Packaging and Shipping:** All components of the membrane system shall be delivered to the site in the Manufacturer's packaging, clearly identified with the products type and batch number.

(b) **Storage and Protection:** The Applicator shall be provided with a storage area for all components. The area shall be cool, dry and out of direct sunlight and shall be in accordance with the Manufacturer's recommendations and relevant health and safety regulations.

Copies of Material Safety Data Sheets (MSDS) for all components shall be kept on site for review by the Engineer or other personnel.

(c) **Shelf Life - Membrane Components:** Packaging of all membrane components shall include a shelf life date sealed by the Manufacturer. No membrane components whose shelf life has expired shall be used.

4. Surface Preparation:

- (a) Protection: The Applicator shall be responsible for the protection of equipment and adjacent areas from over spray or other contamination. Parapets and bridge joints shall be masked prior to application of the materials.
- (b) Surface Preparation: Sharp peaks and discontinuities shall be ground smooth. The surface profile of the prepared substrate is not to exceed 1/4 inch (6 mm) (peak to valley) and areas of minor surface deterioration of 1/2 inch (13 mm) and greater in depth shall also be repaired. The extent and location of the surface patches require the approval of the Engineer before the membrane system is applied.

Surfaces shall be free of oil, grease, curing compounds, loose particles, moss, algae, growth, laitance, friable matter, dirt, bituminous products, and previous waterproofing materials. If required, degreasing shall be done by detergent washing in accordance with ASTM D4258.

The surface shall be abrasively cleaned, in accordance with ASTM D4259, to provide a sound substrate free from laitance.

Voids, honeycombed areas, and blow holes on vertical surfaces shall be repaired in the same manner.

All steel components to receive membrane waterproofing shall be blast cleaned in accordance with SSPC SP6 and coated with the membrane waterproofing system within the same work shift.

5. Inspection and Testing: Prior to priming of the surface, the Engineer, Applicator and Manufacturer's technical representative shall inspect and approve the prepared substrate.

- (a) Random tests for deck moisture content shall be conducted on the substrate by the Applicator at the job site using a "Sovereign Portable Electronic Moisture Master Meter," a "Tramex CMEXpertII Concrete Moisture Meter" or approved equal. The minimum frequency shall be one test per 1000 s.f. (100 sq.m) but not less than three tests per day per bridge. Additional tests may be required if atmospheric conditions change and retest of the substrate moisture content is warranted.

The membrane system shall not be installed on substrate with a moisture content greater than that recommended by the system's manufacturer, but shall not be greater than 6%, whichever is less.

- (b) Random tests for adequate tensile bond strength shall be conducted on the substrate using an adhesion tester in accordance with the requirements of ASTM D4541. The minimum frequency shall be one test per 5,000 s.f. (500 sq.m) but not less than three adhesion tests per bridge.

Adequate surface preparation will be indicated by tensile bond strengths of primer to the substrate greater than or equal to 150 psi (1.0 MPa) or failure in a concrete surface and greater than or equal to 300 psi (2.1 MPa) for steel surfaces.

If the tensile bond strength is lower than the minimum specified, the Engineer may request additional substrate preparation. Any primer not adequately applied shall be removed and a new primer applied at the Contractor's expense, as directed by Engineer.

- (c) Cracks and grouted joints shall be treated in accordance with the Manufacturer's recommendations, as approved or directed by the Engineer.

6. Application:

- (a) The System shall be applied in four distinct steps as follows:
 - 1) Substrate preparation and gap/joint bridging preparation
 - 2) Priming
 - 3) Membrane application
 - 4) Membrane with aggregate
- (b) Immediately prior to the application of any components of the System, the surface shall be dry (see Section 5a of this specification) and any remaining dust or loose particles shall be removed using clean, dry oil-free compressed air or industrial vacuum.
- (c) Where the area to be treated is bound by a vertical surface (e.g. curb or wall), the membrane system may be continued up the vertical, as shown on the plans or as directed by the Engineer.
- (d) The handling, mixing and addition of components shall be performed in a safe manner to achieve the desired results, in accordance with the Manufacturer's recommendations or as approved or directed by the Engineer.
- (e) A neat finish with well defined boundaries and straight edges shall be provided by the Applicator.
- (f) Primer: The primer shall consist of one coat with an overall coverage rate of 125 to 175 s.f./gal (3.0 to 4.3sq.m/1) unless otherwise recommended in the manufacturer's written instructions.

All components shall be measured and mixed in accordance with the Manufacturer's recommendations.

The primer shall be spray applied using a single component spray system approved for use by the Manufacturer. If required by site conditions and allowed by the manufacturer, brush or roller application will be allowed.

The primer shall be allowed to cure tack-free for a minimum of 30 minutes or as required by the Manufacturer's instructions, whichever time is greater, prior to application of the first lift of waterproofing membrane.

Porous concrete (brick) may require a second coat of primer should the first coat be absorbed.

- (g) Membrane: The waterproofing membrane shall consist of one or two coats for a total dry film thickness of 80 mils (2 mm). If applied in two coats, the second coat shall be of a contrasting color to aid in quality assurance and inspection.

The membrane shall be comprised of Components A and B and a hardener powder which is to be added to Component B in accordance with the Manufacturer's recommendations.

The substrate shall be coated in a methodical manner.

Thickness checks: For each layer, checks for wet film thickness using a gauge pin or standard comb-type thickness gauge shall be carried out typically once every 100 s.f. (9 sq.m). Where rapid set time of the membrane does not allow for wet film thickness checks, ultrasonic testing (steel surfaces only), calibrated point-penetrating (destructive) testing, in-situ sampling (cutout of small sections for measuring thicknesses), or other methods approved by the Engineer shall be employed for determination of dry film thickness. The measured thickness of each and every individual test of the membrane shall be greater than or equal to the required thickness.

Bond Strength: Random tests for adequate tensile bond strength shall be conducted on the membrane in accordance with the requirements of ASTM D4541. The minimum test frequency shall be one test per 5,000 s.f. (500 sq.m) but no less than three adhesion tests per bridge. Adequate adhesion will be indicated by tensile bond strengths of the membrane to the substrate of greater than or equal to 150 psi (0.7 MPa) or failure in a concrete surface and greater than or equal to 300 psi (2.1 MPa) for steel surfaces.

Spark Testing: Following application of the membrane, test for pin holes in the cured membrane system over the entire application area in accordance with ASTM D4787- "Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates." Conduct the test at voltages recommended by the manufacturer to prevent damage to the membrane.

Repair the membrane system following destructive testing and correct any deficiencies in the membrane system or substrate noted during quality-control testing in accordance with the manufacturer's recommendations to the satisfaction of the Engineer at no additional cost to the State.

- (h) Repairs: If an area is left untreated or the membrane becomes damaged, a patch repair shall be carried out to restore the integrity of the system. The damaged areas shall be cut back to sound materials and wiped with solvent (e.g. acetone) up to a width of at least four inches (100 mm) on the periphery, removing any contaminants unless otherwise recommended by the manufacturer. The substrate shall be primed as necessary, followed by the membrane. A continuous layer shall be obtained over the substrate with a four inches (100 mm) overlap onto existing membrane.

Where the membrane is to be joined to existing cured material, the new application shall overlap the existing by at least four inches (100 mm). Cleaning and surface preparation on areas to be lapped shall be as recommended in the manufacturer's written instructions.

- (i) Aggregated Finish:
 - 1) Apply an additional 40 mil (1 mm) thick layer of the membrane material immediately followed by an aggregate coating, before the membrane cures, at a rate to fully cover the exposed area. The membrane and aggregate shall be fully integrated after the aggregate has been applied and the membrane cured.
 - 2) Localized areas not fully coated shall be touched-up with additional membrane and aggregate as needed.
 - 3) Remove loose and excess aggregate from the surface to the satisfaction of the Engineer and dispose of properly after application prior to allowing traffic onto finished surface or application of tack coat.
- (j) Bond Coat:

Prior to application of a bituminous concrete overlay, the aggregated finish shall be coated with a bonding material. The bonding material shall be per the membrane waterproofing manufacturer's recommendations.

- 7. Final Review: The Engineer and the Applicator shall jointly review the area(s) over which the completed System has been installed. Any irregularities or other items that do not meet the requirements of the Engineer shall be addressed at this time.

Method of Measurement: The quantity to be paid for under this item shall be the number of square yards (square meters) of waterproofed surface completed and accepted.

Basis of Payment: This item will be paid for at the contract unit price per square yard (square meter) of "Membrane Waterproofing (Cold Liquid Elastomeric)," complete in place, which price

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shall include all surface preparation, furnishing, storing and applying the system, technical representative and quality control tests, and any necessary repairs and remediation work as well as all materials, equipment, tools, labor incidental to this work.

Pay Item
Membrane Waterproofing (Cold Liquid Elastomeric)

Pay Unit
s.y. (sq.m)

ITEM #0904500A - METAL BRIDGE RAIL (ORNAMENTAL GRILLE)

Description: Work under this item shall consist of fabricating and installing metal bridge railing consisting of steel rail elements fastened to concrete posts and curbs as shown on the plans and in accordance with this specification. The work shall also include galvanizing and shop painting of all the steel elements.

Materials: Materials for this work shall conform to the following requirements:

Steel:

The steel rails shall be fabricated from structural steel tubing meeting the requirements of ASTM A500, Grade B and meet the longitudinal CVN requirements of 15 ft-lbs @ 0° F or ASTM A501.

Backing plates, splice plates and anchorage plates shall be fabricated from steel meeting the requirements of AASHTO M270, Grade 50.

Round head bolts shall be manufactured in accordance with the sizes designated on the plans, in accordance with ASTM A307 Grade A specifications.

All rails, posts, backing plates, bolts, splice plates, anchorage plates and other shapes shall be galvanized after shop fabrication in conformance with ASTM A 123.

Preset Anchorage:

The preset anchorages shall be D108A NC Headed Dowel Bar Inserts manufactured by Dayton Superior as detailed on the contract plans. Preset anchorages configured differently from those detailed on the plans may be used provided they have the same or better load capacities and are approved by the Engineer prior to fabrication.

After fabrication, the preset anchorage shall be hot-dip galvanized in accordance with ASTM A153. The bolt threads shall be "free running" in the ferrules after galvanization.

Bolts for the preset anchorage shall stainless steel conforming to the requirements of ASTM A193, Class 1 or Class 2, Grade B8 (AISI Type 304). The manufacturer's symbol and the grade shall be clearly marked on the bolt heads. All washers shall be standard size and conform to ASTM A167, Types 302 through 305.

Molded Pads:

Molded pads shall be manufactured from new unvulcanized elastomer and unused synthetic fibers, with a weight proportion of fiber content equal to approximately one-half of the total weight of the pad. The pads shall be formed into single sheets of 1/8-inch minimum thickness,

with a tolerance of plus or minus 10 percent. Pads shall have a Shore 'A' Durometer hardness within the range of 70 to 90, and shall have a minimum compressive breakdown of 7,000 psi.

The Contractor shall furnish a Materials Certificate and a Certificate of Compliance in conformance with the requirements of Article 1.06.07 for the following materials: rail posts, backing plates, splice plates, bolts, nuts, washers and molded pads.

Paint: The painting system shall be the same system used to paint the bridge as per item "Abrasive Blast Cleaning and Field painting of Structure (Site No. 3)". Color shall be Green - Federal Color #34115.

Construction Methods: Before fabricating any materials, the Contractor shall submit shop drawings to the Engineer for approval in accordance with Article 1.05.02-3. These drawings shall include but not be limited to the following information: a layout plan showing post spacing, post to baseplate connection, rail to post connections, anchorage details, material designations and the name and telephone number of a person to contact who can answer questions about the shop drawings

Welding details and procedures shall conform to AWS D1.1 - Structural Welding Code – Steel.

The anchorage assemblies and rail posts shall be installed vertical. The anchorages shall be firmly and accurately held in position prior to and during the placing of concrete.

The rails shall be carefully adjusted prior to fixing in place to insure proper matching at abutting joints and correct alignment and curvature throughout their length.

After installation, all rails and posts shall be free of burrs, sharp edges and irregularities.

Method of Measurement: This work will be measured for payment by linear feet of parapet installed (steel railing + concrete posts) and shall be measured horizontally between ends of decks from abutment to abutment.

Basis of Payment: This work will be paid for at the contract unit price per linear foot for "Metal Bridge Rail (Ornamental Grille)", complete and accepted in place, which price shall include all materials, equipment, tools, labor and work incidental thereto for fabricating, shop painting and installation of Metal Bridge Rail.

Construction of concrete posts and curbs for the railing system shall be paid for under the special provision item, "Class "F" Concrete".

ITEM #0971001A - MAINTENANCE AND PROTECTION OF TRAFFIC

Article 9.71.01 – Description is supplemented by the following:

The Contractor shall maintain and protect traffic as described by the following and as limited in the Special Provision "Prosecution and Progress":

The Contractor shall coordinate their work with adjacent and other Fairfield County Area projects along Route I-95, Route 15, U.S. Route 7, and U.S. Route 1, including DOT Maintenance Operations, to minimize impact to traffic through the region.

Route 15 (Merritt Parkway)

The Contractor shall maintain and protect the minimum number of through lanes and shoulders as dictated in the Special Provision for Section 1.08 - Prosecution and Progress "Limitations of Operations - Minimum Number of Lanes to Remain Open" Chart, on a paved travel path not less than 12 feet in width per lane.

During Stage Construction, existing traffic operations will be considered to be as shown on the Stage Construction Plans contained in the project plans; or as shown on the Typical Traffic Shift Plans contained in the special provision for Item No. 0971001A.

The Contractor shall be allowed to halt traffic for a period of time not to exceed 10 minutes to perform necessary work. The Contractor shall submit a plan for such activity and an explanation of the hardship requiring the traffic stoppage. If more than one 10-minute period is required, the Contractor shall allow all stored vehicles to proceed through the work area prior to the next stoppage.

All Ramps and Turning Roadways

The Contractor shall maintain and protect existing traffic operations.

Excepted therefrom will be those periods, during the allowable periods, when the Contractor is actively working, at which time the Contractor shall be allowed to maintain and protect a minimum of one lane of traffic, on a paved travel path not less than 12 feet in width.

Excepted therefrom will be those periods, during the allowable periods, when the Contractor is actively working, at which time the Contractor shall be allowed to close any ramp where the available width is less than 28 feet and detour traffic. The Contractor should provide the ramp detour plan to the engineer two weeks prior to any ramp closures.

Bridge No. 00726 – Newtown Turnpike over Merritt Parkway

The Contractor shall maintain and protect a minimum of one lane of traffic in each direction, each lane on a paved travel path not less than 11 feet in width.

The Contractor will be allowed to close Newtown Turnpike to through traffic and detour traffic as shown on the Detour Plan contained in the contract plans.

Bridge No. 00736 – Redding Road over Merritt Parkway

The Contractor shall maintain and protect a minimum of one lane of traffic in each direction, each lane on a paved travel path not less than 11 feet in width.

The Contractor will be allowed to close Redding Road to through traffic and detour traffic as shown on the Detour Plan contained in the contract plans.

Bridge No. 00735 – Merwins Lane over Merritt Parkway

The Contractor shall maintain and protect a minimum of one lane of traffic in each direction, each lane on a paved travel path not less than 11 feet in width.

Excepted therefrom will be those periods, during the allowable periods, when the Contractor is actively working, at which time the Contractor shall maintain and protect at least an alternating one-way traffic operation, on a paved travel path not less than 11 feet in width. The length of the alternating one-way traffic operation shall not exceed 300 feet, or as shown on the M&PT Plan contained in the contract plans.

Bridge No. 00729 – Clinton Avenue over Merritt Parkway

The Contractor shall maintain and protect a minimum of one lane of traffic in each direction, each lane on a paved travel path not less than 11 feet in width.

Excepted therefrom will be those periods, during the allowable periods, when the Contractor is actively working, at which time the Contractor shall maintain and protect at least an alternating one-way traffic operation, on a paved travel path not less than 11 feet in width. The length of the alternating one-way traffic operation shall not exceed 300 feet.

Bridge No. 05763 – Route 33 (Wilton Road) under Merritt Parkway

The Contractor shall maintain and protect a minimum of one lane of traffic in each direction, each lane on a paved travel path not less than 11 feet in width.

Where turn lanes exist, the Contractor shall provide an additional 10 feet of paved travel path to be used for turning vehicles only. This additional 10 feet of travel path shall be a minimum length of 150 feet. It shall be implemented so that sufficient storage, taper length, and turning radius are provided.

Excepted therefrom will be those periods, during the allowable periods, when the Contractor is actively working, at which time the Contractor shall maintain and protect at least an alternating one-

way traffic operation, on a paved travel path not less than 11 feet in width. The length of the alternating one-way traffic operation shall not exceed 300 feet.

Bridge No. 00728 – Saugatuck River under Merritt Parkway (Project No. 158-207)

The Contractor shall maintain and protect existing traffic operations.

Excepted therefrom will be those periods, during the allowable periods, when the Contractor is actively working, at which time the Contractor shall be allowed to maintain traffic in accordance with the Stage Constructions Plans contained in the Contract plans.

Bridge No. 00730 – Route 57 (Weston Road) under Merritt Parkway

Bridge No. 00733 – Bayberry Lane under Merritt Parkway

Bridge No. 00734 – Cross Highway under Merritt Parkway

The Contractor shall maintain and protect a minimum of one lane of traffic in each direction, each lane on a paved travel path not less than 11 feet in width.

Where turn lanes exist, the Contractor shall provide an additional 10 feet of paved travel path to be used for turning vehicles only. This additional 10 feet of travel path shall be a minimum length of 150 feet. It shall be implemented so that sufficient storage, taper length, and turning radius are provided.

Excepted therefrom will be those periods, during the allowable periods, when the Contractor is actively working, at which time the Contractor shall maintain and protect at least an alternating one-way traffic operation, on a paved travel path not less than 11 feet in width. The length of the alternating one-way traffic operation shall not exceed 300 feet.

All Other Roadways

The Contractor shall maintain and protect a minimum of one lane of traffic in each direction, each lane on a paved travel path not less than 11 feet in width.

Excepted therefrom will be those periods, during the allowable periods, when the Contractor is actively working, at which time the Contractor shall maintain and protect at least an alternating one-way traffic operation, on a paved travel path not less than 11 feet in width. The length of the alternating one-way traffic operation shall not exceed 300 feet.

Commercial and Residential Driveways

The Contractor shall maintain access to and egress from all commercial and residential driveways throughout the project limits. The Contractor will be allowed to close said driveways to perform the required work during those periods when the businesses are closed, unless permission is granted from the business owner to close the driveway during business hours. If a

temporary closure of a residential driveway is necessary, the Contractor shall coordinate with the owner to determine the time period of the closure.

Article 9.71.03 - Construction Method is supplemented as follows:

General

The Contractor is required to delineate any raised structures within the travel lanes, so that the structures are visible day and night, unless there are specific contract plans and provisions to temporarily lower these structures prior to the completion of work.

The Contractor shall schedule operations so that pavement removal and roadway resurfacing shall be completed full width across a roadway (bridge) section by the end of a workday (work night), or as directed by the Engineer.

When the installation of all intermediate courses of bituminous concrete pavement is completed for the entire roadway, the Contractor shall install the final course of bituminous concrete pavement.

When the Contractor is excavating adjacent to the roadway, the Contractor shall provide a 3-foot shoulder between the work area and travel lanes, with traffic drums spaced every 50 feet. At the end of the workday, if the vertical drop-off exceeds 3 inches, the Contractor shall provide a temporary traversable slope of 4:1 or flatter that is acceptable to the Engineer.

The Contractor, during the course of active construction work on overhead signs and structures, shall close the lanes directly below the work area for the entire length of time overhead work is being undertaken. At no time shall an overhead sign be left partially removed or installed.

If applicable, when an existing sign is removed, it shall be either relocated or replaced by a new sign during the same working day.

The Contractor shall not store any material on-site which would present a safety hazard to motorists or pedestrians (e.g. fixed object or obstruct sight lines).

The field installation of a signing pattern shall constitute interference with existing traffic operations and shall not be allowed, except during the allowable periods.

Construction vehicles entering travel lanes at speeds less than the posted speed are interfering with traffic, and shall not be allowed without a lane closure. The lane closure shall be of sufficient length to allow vehicles to enter or exit the work area at posted speeds, in order to merge with existing traffic.

Existing Signing

The Contractor shall maintain all existing overhead and side-mounted signs throughout the project limits during the duration of the project. The Contractor shall temporarily relocate signs and sign supports as many times as deemed necessary, and install temporary sign supports if necessary and as directed by the Engineer.

Requirements for Winter

The Contractor shall schedule a meeting with representatives from the Department including the offices of Maintenance and Traffic, and the Town/City to determine what interim traffic control measures the Contractor shall accomplish for the winter to provide safety to the motorists and permit adequate snow removal procedures. This meeting shall be held prior to October 31 of each year and will include, but not be limited to, discussion of the status and schedule of the following items: lane and shoulder widths, pavement restoration, traffic signal work, pavement markings, and signing.

Signing Patterns

The Contractor shall erect and maintain all signing patterns in accordance with the traffic control plans contained herein. Proper distances between advance warning signs and proper taper lengths are mandatory.

Pavement Markings - Limited Access Highways, Turning Roadways and Ramps

During construction, the Contractor shall maintain all pavement markings throughout the limits of the project.

Interim Pavement Markings

The Contractor shall install painted pavement markings, which shall include lane lines (broken lines), shoulder edge lines, stop bars, lane-use arrows and gore markings, on each intermediate course of bituminous concrete pavement and on any milled surface by the end of the work day/night. All painted pavement markings will be paid under the appropriate items.

If the Contractor does not install permanent Epoxy Resin Pavement Markings by the end of the work day/night on exit ramps where the final course of bituminous concrete pavement has been installed, the Contractor shall install temporary 12 inch wide white stop bars. The temporary stop bars shall consist of Temporary Plastic Pavement Marking Tape and shall be installed by the end of the work day/night. Stop bars may consist of two 6 inch wide white markings or three 4 inch wide white markings placed side by side. The Contractor shall remove and dispose of these markings when the permanent Epoxy Resin Pavement Markings are installed. The cost of furnishing, installing and removing the Temporary Plastic Pavement Marking Tape shall be at the Contractor's expense.

If an intermediate course of bituminous concrete pavement will be exposed throughout the winter, then Epoxy Resin Pavement Markings should be installed unless directed otherwise by the Engineer.

Final Pavement Markings

The Contractor should install painted pavement markings on the final course of bituminous concrete pavement by the end of the work day/night. If the painted pavement markings are not installed by the end of the work day/night, then Temporary Plastic Pavement Marking Tape shall be installed as described above and the painted pavement markings shall be installed by the end of the work day/night on Friday of that week.

If Temporary Plastic Pavement Marking Tape is installed, the Contractor shall remove and dispose of these markings when the painted pavement markings are installed. The cost of furnishing, installing and removing the Temporary Plastic Pavement Marking Tape shall be at the Contractor's expense.

The Contractor shall install permanent Epoxy Resin Pavement Markings in accordance with Section 12.10 entitled "Epoxy Resin Pavement Markings, Symbols, and Legends" after such time as determined by the Engineer.

Pavement Markings -Non-Limited Access Multilane Roadways

Secondary and Local Roadways

During construction, the Contractor shall maintain all pavement markings on paved surfaces on all roadways throughout the limits of the project.

Interim Pavement Markings

The Contractor shall install painted pavement markings, which shall include centerlines, shoulder edge lines, lane lines (broken lines), lane-use arrows, and stop bars, on each intermediate course of bituminous concrete pavement and on any milled surface by the end of the work day/night. If the next course of bituminous concrete pavement will be placed within seven days, shoulder edge lines are not required. The painted pavement markings will be paid under the appropriate items.

If the Contractor will install another course of bituminous concrete pavement within 24 hours, the Contractor may install Temporary Plastic Pavement Marking Tape in place of the painted pavement markings by the end of the work day/night. These temporary pavement markings shall include centerlines, lane lines (broken lines) and stop bars; shoulder edge lines are not required. Centerlines shall consist of two 4 inch wide yellow markings, 2 feet in length, side by side, 4 to 6 inches apart, at 40-foot intervals. No passing zones should be posted with signs in those areas where the final centerlines have not been established on two-way roadways. Stop bars may consist of two 6 inch wide white markings or three 4 inch wide white markings placed side by side. The Contractor shall remove and dispose of the Temporary Plastic Pavement Marking Tape when another course of bituminous concrete pavement is installed. The cost of furnishing, installing and removing the Temporary Plastic Pavement Marking Tape shall be at the Contractor's expense.

If an intermediate course of bituminous concrete pavement will be exposed throughout the winter, then Epoxy Resin Pavement Markings should be installed unless directed otherwise by the Engineer.

Final Pavement Markings

The Contractor should install painted pavement markings on the final course of bituminous concrete pavement by the end of the work day/night. If the painted pavement markings are not installed by the end of the work day/night, then Temporary Plastic Pavement Marking Tape shall be installed as described above and the painted pavement markings shall be installed by the end of the work day/night on Friday of that week.

If Temporary Plastic Pavement Marking Tape is installed, the Contractor shall remove and dispose of these markings when the painted pavement markings are installed. The cost of furnishing, installing and removing the Temporary Plastic Pavement Marking Tape shall be at the Contractor's expense.

The Contractor shall install permanent Epoxy Resin Pavement Markings in accordance with Section 12.10 entitled "Epoxy Resin Pavement Markings, Symbols, and Legends" after such time as determined by the Engineer.

TRAFFIC CONTROL DURING CONSTRUCTION OPERATIONS

The following guidelines shall assist field personnel in determining when and what type of traffic control patterns to use for various situations. These guidelines shall provide for the safe and efficient movement of traffic through work zones and enhance the safety of work forces in the work area.

TRAFFIC CONTROL PATTERNS

Traffic control patterns shall be used when a work operation requires that all or part of any vehicle or work area protrudes onto any part of a travel lane or shoulder. For each situation, the installation of traffic control devices shall be based on the following:

- Speed and volume of traffic
- Duration of operation
- Exposure to hazards

Traffic control patterns shall be uniform, neat and orderly so as to command respect from the motorist.

In the case of a horizontal or vertical sight restriction in advance of the work area, the traffic control pattern shall be extended to provide adequate sight distance for approaching traffic.

If a lane reduction taper is required to shift traffic, the entire length of the taper should be installed on a tangent section of roadway so that the entire taper area can be seen by the motorist.

Any existing signs that are in conflict with the traffic control patterns shall be removed, covered, or turned so that they are not readable by oncoming traffic.

When installing a traffic control pattern, a Buffer Area should be provided and this area shall be free of equipment, workers, materials and parked vehicles.

Typical traffic control plans 19 through 25 may be used for moving operations such as line striping, pot hole patching, mowing, or sweeping when it is necessary for equipment to occupy a travel lane.

Traffic control patterns will not be required when vehicles are on an emergency patrol type activity or when a short duration stop is made and the equipment can be contained within the shoulder. Flashing lights and appropriate trafficperson shall be used when required.

Although each situation must be dealt with individually, conformity with the typical traffic control plans contained herein is required. In a situation not adequately covered by the typical traffic control plans, the Contractor must contact the Engineer for assistance prior to setting up a traffic control pattern.

PLACEMENT OF SIGNS

Signs must be placed in such a position to allow motorists the opportunity to reduce their speed prior to the work area. Signs shall be installed on the same side of the roadway as the work area. On multi-lane divided highways, advance warning signs shall be installed on both sides of the highway. On directional roadways (on-ramps, off-ramps, one-way roads), where the sight distance to signs is restricted, these signs should be installed on both sides of the roadway.

ALLOWABLE ADJUSTMENT OF SIGNS AND DEVICES SHOWN ON THE TRAFFIC CONTROL PLANS

The traffic control plans contained herein show the location and spacing of signs and devices under ideal conditions. Signs and devices should be installed as shown on these plans whenever possible.

The proper application of the traffic control plans and installation of traffic control devices depends on actual field conditions.

Adjustments to the traffic control plans shall be made only at the direction of the Engineer to improve the visibility of the signs and devices and to better control traffic operations. Adjustments to the traffic control plans shall be based on safety of work forces and motorists, abutting property requirements, driveways, side roads, and the vertical and horizontal curvature of the roadway.

The Engineer may require that the traffic control pattern be located significantly in advance of the work area to provide better sight line to the signing and safer traffic operations through the work zone.

Table I indicates the minimum taper length required for a lane closure based on the posted speed limit of the roadway. These taper lengths shall only be used when the recommended taper lengths shown on the traffic control plans cannot be achieved.

TABLE I – MINIMUM TAPER LENGTHS

POSTED SPEED LIMIT MILES PER HOUR	MINIMUM TAPER LENGTH IN FEET FOR A SINGLE LANE CLOSURE
30 OR LESS	180
35	250
40	320
45	540
50	600
55	660
65	780

SECTION 1. WORK ZONE SAFETY MEETINGS

- 1.a) Prior to the commencement of work, a work zone safety meeting will be conducted with representatives of DOT Construction, Connecticut State Police (Local Barracks), Municipal Police, the Contractor (Project Superintendent) and the Traffic Control Subcontractor (if different than the prime Contractor) to review the traffic operations, lines of responsibility, and operating guidelines which will be used on the project. Other work zone safety meetings during the course of the project should be scheduled as needed.
- 1.b) A Work Zone Safety Meeting Agenda shall be developed and used at the meeting to outline the anticipated traffic control issues during the construction of this project. Any issues that can't be resolved at these meetings will be brought to the attention of the District Engineer and the Office of Construction. The agenda should include:
- Review Project scope of work and time
 - Review Section 1.08, Prosecution and Progress
 - Review Section 9.70, Trafficpersons
 - Review Section 9.71, Maintenance and Protection of Traffic
 - Review Contractor's schedule and method of operations.
 - Review areas of special concern: ramps, turning roadways, medians, lane drops, etc.
 - Open discussion of work zone questions and issues
 - Discussion of review and approval process for changes in contract requirements as they relate to work zone areas

SECTION 2. GENERAL

- 2.a) If the required minimum number of signs and equipment (i.e. one High Mounted Internally Illuminated Flashing Arrow for each lane closed, two TMAs, Changeable Message Sign, etc.) are not available; the traffic control pattern shall not be installed.
- 2.b) The Contractor shall have back-up equipment (TMAs, High Mounted Internally Illuminated Flashing Arrow, Changeable Message Sign, construction signs, cones/drums, etc.) available at all times in case of mechanical failures, etc. The only exception to this is in the case of sudden equipment breakdowns in which the pattern may be installed but the Contractor must provide replacement equipment within 24 hours.
- 2.c) Failure of the Contractor to have the required minimum number of signs, personnel and equipment, which results in the pattern not being installed, shall not be a reason for a time extension or claim for loss time.
- 2.d) In cases of legitimate differences of opinion between the Contractor and the Inspection staff, the Inspection staff shall err on the side of safety. The matter shall be brought to

the District Office for resolution immediately or, in the case of work after regular business hours, on the next business day.

SECTION 3. INSTALLING AND REMOVING TRAFFIC CONTROL PATTERNS

- 3.a) Lane Closures shall be installed beginning with the advance warning signs and proceeding forward toward the work area.
- 3.b) Lane Closures shall be removed in the reverse order, beginning at the work area, or end of the traffic control pattern, and proceeding back toward the advance warning signs.
- 3.c) Stopping traffic may be allowed:
 - As per the contract for such activities as blasting, steel erection, etc.
 - During paving, milling operations, etc. where, in the middle of the operation, it is necessary to flip the pattern to complete the operation on the other half of the roadway and traffic should not travel across the longitudinal joint or difference in roadway elevation.
 - To move slow moving equipment across live traffic lanes into the work area.
- 3.d) Under certain situations when the safety of the traveling public and/or that of the workers may be compromised due to conditions such as traffic volume, speed, roadside obstructions, or sight line deficiencies, as determined by the Engineer and/or State Police, traffic may be briefly impeded while installing and/or removing the advance warning signs and the first ten traffic cones/drums only. Appropriate measures shall be taken to safely slow traffic. If required, traffic slowing techniques may be used and shall include the use of Truck Mounted Impact Attenuators (TMAs) as appropriate, for a minimum of one mile in advance of the pattern starting point. Once the advance warning signs and the first ten traffic cones/drums are installed/removed, the TMAs and sign crew shall continue to install/remove the pattern as described in Section 5 and traffic shall be allowed to resume their normal travel.
- 3.e) The Contractor must adhere to using the proper signs, placing the signs correctly, and ensuring the proper spacing of signs.
- 3.f) Additional devices are required on entrance ramps, exit ramps, and intersecting roads to warn and/or move traffic into the proper travel path prior to merging/exiting with/from the main line traffic. This shall be completed before installing the mainline pattern past the ramp or intersecting roadway.
- 3.g) Prior to installing a pattern, any conflicting existing signs shall be covered with an opaque material. Once the pattern is removed, the existing signs shall be uncovered.

- 3.h) On limited access roadways, workers are prohibited from crossing the travel lanes to install and remove signs or other devices on the opposite side of the roadway. Any signs or devices on the opposite side of the roadway shall be installed and removed separately.

SECTION 4. USE OF HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW

- 4.a) On limited access roadways, one Flashing Arrow shall be used for each lane that is closed. The Flashing Arrow shall be installed concurrently with the installation of the traffic control pattern and its placement shall be as shown on the traffic control plan. For multiple lane closures, one Flashing Arrow is required for each lane closed. If conditions warrant, additional Flashing Arrows should be employed (i.e.: curves, major ramps, etc.).
- 4.b) On non-limited access roadways, the use of a Flashing Arrow for lane closures is optional. The roadway geometry, sight line distance, and traffic volume should be considered in the decision to use the Flashing Arrow.
- 4.c) The Flashing Arrow shall not be used on two lane, two-way roadways for temporary alternating one-way traffic operations.
- 4.d) The Flashing Arrow board display shall be in the “arrow” mode for lane closure tapers and in the “caution” mode (four corners) for shoulder work, blocking the shoulder, or roadside work near the shoulder. The Flashing Arrow shall be in the “caution” mode when it is positioned in the closed lane.
- 4.e) The Flashing Arrow shall not be used on a multi-lane roadway to laterally shift all lanes of traffic, because unnecessary lane changing may result.

SECTION 5. USE OF TRUCK MOUNTED IMPACT ATTENUATOR VEHICLES (TMAs)

- 5.a) For lane closures on limited access roadways, a minimum of two TMAs shall be used to install and remove traffic control patterns. If two TMAs are not available, the pattern shall not be installed.
- 5.b) On non-limited access roadways, the use of TMAs to install and remove patterns closing a lane(s) is optional. The roadway geometry, sight line distance, and traffic volume should be considered in the decision to utilize the TMAs.
- 5.c) Generally, to establish the advance and transition signing, one TMA shall be placed on the shoulder and the second TMA shall be approximately 1,000 feet ahead blocking the lane. The flashing arrow board mounted on the TMA should be in the “flashing arrow” mode when taking the lane. The sign truck and workers should be immediately ahead of

the second TMA. In no case shall the TMA be used as the sign truck or a work truck. Once the transition is in place, the TMAs shall travel in the closed lane until all Changeable Message Signs, signs, Flashing Arrows, and cones/drums are installed. The flashing arrow board mounted on the TMA should be in the “caution” mode when traveling in the closed lane.

- 5.d) A TMA shall be placed prior to the first work area in the pattern. If there are multiple work areas within the same pattern, then additional TMAs shall be positioned at each additional work area as needed. The flashing arrow board mounted on the TMA should be in the “caution” mode when in the closed lane.
- 5.e) TMAs shall be positioned a sufficient distance prior to the workers or equipment being protected to allow for appropriate vehicle roll-ahead in the event that the TMA is hit, but not so far that an errant vehicle could travel around the TMA and into the work area. For additional placement and use details, refer to the specification entitled “Type ‘D’ Portable Impact Attenuation System”. Some operations, such as paving and concrete repairs, do not allow for placement of the TMA(s) within the specified distances. In these situations, the TMA(s) should be placed at the beginning of the work area and shall be advanced as the paving or concrete operations proceed.
- 5.f) TMAs should be paid in accordance with how the unit is utilized. When it is used as a TMA and is in the proper location as specified, and then it should be paid at the specified hourly rate for “Type ‘D’ Portable Impact Attenuation System”. When the TMA is used as a Flashing Arrow, it should be paid at the daily rate for “High Mounted Internally Illuminated Flashing Arrow”. If a TMA is used to install and remove a pattern and then is used as a Flashing Arrow, the unit should be paid as a “Type ‘D’ Portable Impact Attenuation System” for the hours used to install and remove the pattern, typically 2 hours (1 hour to install and 1 hour to remove), and is also paid for the day as a “High Mounted Internally Illuminated Flashing Arrow”.

SECTION 6. USE OF TRAFFIC DRUMS AND TRAFFIC CONES

- 6.a) Traffic drums shall be used for taper channelization on limited-access roadways, ramps, and turning roadways and to delineate raised catch basins and other hazards.
- 6.b) Traffic drums shall be used in place of traffic cones in traffic control patterns that are in effect for more than a 36-hour duration.
- 6.c) Traffic Cones less than 42 inches in height shall not be used on limited-access roadways or on non-limited access roadways with a posted speed limit of 45 mph and above.
- 6.d) Typical spacing of traffic drums and/or cones shown on the Traffic Control Plans in the Contract are maximum spacings and may be reduced to meet actual field conditions as required.

SECTION 7. USE OF (REMOTE CONTROLLED) CHANGEABLE MESSAGE SIGNS (CMS)

- 7.a) For lane closures on limited access roadways, one CMS shall be used in advance of the traffic control pattern. Prior to installing the pattern, the CMS shall be installed and in operation, displaying the appropriate lane closure information (i.e.: Left Lane Closed - Merge Right). The CMS shall be positioned ½ - 1 mile ahead of the lane closure taper. If the nearest Exit ramp is greater than the specified ½ - 1 mile distance, than an additional CMS shall be positioned a sufficient distance ahead of the Exit ramp to alert motorists to the work and therefore offer them an opportunity to take the exit.
- 7.b) CMS should not be installed within 1000 feet of an existing CMS.
- 7.c) On non-limited access roadways, the use of CMS for lane closures is optional. The roadway geometry, sight line distance, and traffic volume should be considered in the decision to use the CMS.
- 7.d) The advance CMS is typically placed off the right shoulder, 5 feet from the edge of pavement. In areas where the CMS cannot be placed beyond the edge of pavement, it may be placed on the paved shoulder with a minimum of five (5) traffic drums placed in a taper in front of it to delineate its position. The advance CMS shall be adequately protected if it is used for a continuous duration of 36 hours or more.
- 7.e) When the CMS are no longer required, they should be removed from the clear zone and have the display screen cleared and turned 90° away from the roadway.
- 7.f) The CMS generally should not be used for generic messages (ex: Road Work Ahead, Bump Ahead, Gravel Road, etc.).
- 7.g) The CMS should be used for specific situations that need to command the motorist's attention which cannot be conveyed with standard construction signs (Examples include: Exit 34 Closed Sat/Sun - Use Exit 35, All Lanes Closed - Use Shoulder, Workers on Road - Slow Down).
- 7.h) Messages that need to be displayed for long periods of time, such as during stage construction, should be displayed with construction signs. For special signs, please coordinate with the Office of Construction and the Division of Traffic Engineering for the proper layout/dimensions required.
- 7.i) The messages that are allowed on the CMS are as follows:

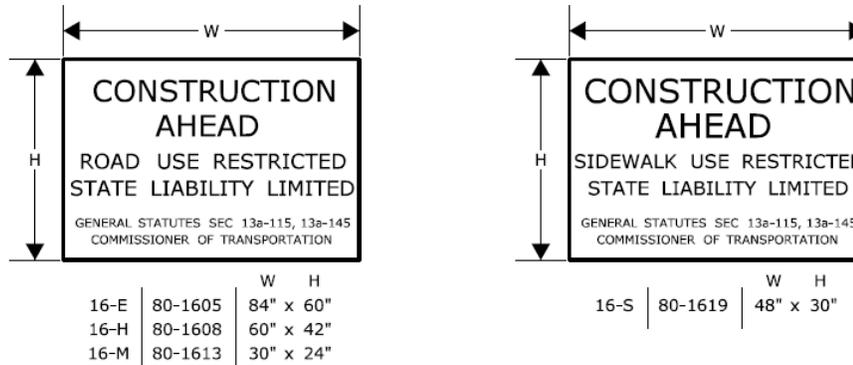
<u>Message No.</u>	<u>Frame 1</u>	<u>Frame 2</u>	<u>Message No.</u>	<u>Frame 1</u>	<u>Frame 2</u>
1	LEFT LANE CLOSED	MERGE RIGHT	9	LANES CLOSED AHEAD	REDUCE SPEED
2	2 LEFT LANES CLOSED	MERGE RIGHT	10	LANES CLOSED AHEAD	USE CAUTION
3	LEFT LANE CLOSED	REDUCE SPEED	11	WORKERS ON ROAD	REDUCE SPEED
4	2 LEFT LANES CLOSED	REDUCE SPEED	12	WORKERS ON ROAD	SLOW DOWN
5	RIGHT LANE CLOSED	MERGE LEFT	13	EXIT XX CLOSED	USE EXIT YY
6	2 RIGHT LANES CLOSED	MERGE LEFT	14	EXIT XX CLOSED USE YY	FOLLOW DETOUR
7	RIGHT LANE CLOSED	REDUCE SPEED	15	2 LANES SHIFT AHEAD	USE CAUTION
8	2 RIGHT LANES CLOSED	REDUCE SPEED	16	3 LANES SHIFT AHEAD	USE CAUTION

For any other message(s), approval must be received from the Office of Construction prior to their use. No more than two (2) displays shall be used within any message cycle.

SECTION 8. USE OF STATE POLICE OFFICERS

- 8.a) State Police may be utilized only on limited access highways and secondary roadways under their primary jurisdiction. One Officer may be used per critical sign pattern. Shoulder closures and right lane closures can generally be implemented without the presence of a State Police Officer. Likewise in areas with moderate traffic and wide, unobstructed medians, left lane closures can be implemented without State Police presence. Under some situations it may be desirable to have State Police presence, when one is available. Examples of this include: nighttime lane closures; left lane closures with minimal width for setting up advance signs and staging; lane and shoulder closures on turning roadways/ramps or mainline where sight distance is minimal; and closures where extensive turning movements or traffic congestion regularly occur, however they are not required.
- 8.b) Once the pattern is in place, the State Police Officer should be positioned in a non-hazardous location in advance of the pattern. If traffic backs up beyond the beginning of the pattern, then the State Police Officer shall be repositioned prior to the backup to give warning to the oncoming motorists. The State Police Officer and TMA should not be in proximity to each other.
- 8.c) Other functions of the State Police Officer(s) may include:
- Assisting entering/exiting construction vehicles within the work area.
 - Enforcement of speed and other motor vehicle laws within the work area, if specifically requested by the project.
- 8.d) State Police Officers assigned to a work site are to only take direction from the Engineer.

SERIES 16 SIGNS



THE 16-S SIGN SHALL BE USED ON ALL PROJECTS THAT REQUIRE SIDEWALK RECONSTRUCTION OR RESTRICT PEDESTRIAN TRAVEL ON AN EXISTING SIDEWALK.

SERIES 16 SIGNS SHALL BE INSTALLED IN ADVANCE OF THE TRAFFIC CONTROL PATTERNS TO ALLOW MOTORISTS THE OPPORTUNITY TO AVOID A WORK ZONE. SERIES 16 SIGNS SHALL BE INSTALLED ON ANY MAJOR INTERSECTING ROADWAYS THAT APPROACH THE WORK ZONE. ON LIMITED-ACCESS HIGHWAYS, THESE SIGNS SHALL BE LOCATED IN ADVANCE OF THE NEAREST UPSTREAM EXIT RAMP AND ON ANY ENTRANCE RAMPS PRIOR TO OR WITHIN THE WORK ZONE LIMITS.

THE LOCATION OF SERIES 16 SIGNS CAN BE FOUND ELSEWHERE IN THE PLANS OR INSTALLED AS DIRECTED BY THE ENGINEER.

SIGNS 16-E AND 16-H SHALL BE POST-MOUNTED.

SIGN 16-E SHALL BE USED ON ALL EXPRESSWAYS.

SIGN 16-H SHALL BE USED ON ALL RAMPS, OTHER STATE ROADWAYS, AND MAJOR TOWN/CITY ROADWAYS.

SIGN 16-M SHALL BE USED ON OTHER TOWN ROADWAYS.

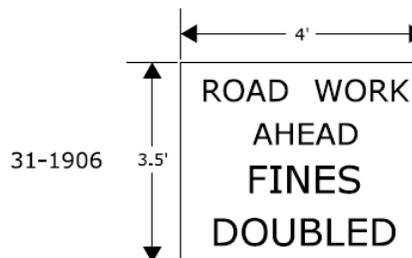
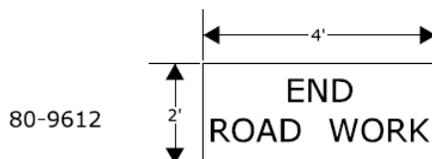
REGULATORY SIGN "ROAD WORK AHEAD, FINES DOUBLED"

THE REGULATORY SIGN "ROAD WORK AHEAD FINES DOUBLED" SHALL BE INSTALLED FOR ALL WORK ZONES THAT OCCUR ON ANY STATE HIGHWAY IN CONNECTICUT WHERE THERE ARE WORKERS ON THE HIGHWAY OR WHEN THERE IS OTHER THAN EXISTING TRAFFIC OPERATIONS.

THE "ROAD WORK AHEAD FINES DOUBLED" REGULATORY SIGN SHALL BE PLACED AFTER THE SERIES 16 SIGN AND IN ADVANCE OF THE "ROAD WORK AHEAD" SIGN.

"END ROAD WORK" SIGN

THE LAST SIGN IN THE PATTERN MUST BE THE "END ROAD WORK" SIGN.



SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN
REQUIRED SIGNS

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED *Charles S. Harlow*
PRINCIPAL ENGINEER
Charles S. Harlow
2012.06.05 11:35:43-04'00'

NOTES FOR TRAFFIC CONTROL PLANS

1. IF A TRAFFIC STOPPAGE OCCURS IN ADVANCE OF SIGN (A), THEN AN ADDITIONAL SIGN (A) SHALL BE INSTALLED IN ADVANCE OF THE STOPPAGE.
2. SIGNS (AA), (A), AND (D) SHOULD BE OMITTED WHEN THESE SIGNS HAVE ALREADY BEEN INSTALLED TO DESIGNATE A LARGER WORK ZONE THAN THE WORK ZONE THAT IS ENCOMPASSED ON THIS PLAN.
3. SEE TABLE 1 FOR ADJUSTMENT OF TAPERS IF NECESSARY.
4. IF THIS PLAN REMAINS IN CONTINUOUS OPERATION FOR MORE THAN 36 HOURS, THEN TRAFFIC DRUMS SHALL BE USED IN PLACE OF TRAFFIC CONES.
5. ANY LEGAL SPEED LIMIT SIGNS WITHIN THE LIMITS OF A ROADWAY / LANE CLOSURE AREA SHALL BE COVERED WITH AN OPAQUE MATERIAL WHILE THE CLOSURE IS IN EFFECT, AND UNCOVERED WHEN THE ROADWAY / LANE CLOSURE IS RE-OPENED TO ALL LANES OF TRAFFIC.
6. IF THIS PLAN REMAINS IN CONTINUOUS OPERATION FOR MORE THAN 36 HOURS, THEN ANY EXISTING CONFLICTING PAVEMENT MARKINGS SHALL BE ERADICATED OR COVERED, AND TEMPORARY PAVEMENT MARKINGS THAT DELINEATE THE PROPER TRAVELPATHS SHALL BE INSTALLED.
7. DISTANCES BETWEEN SIGNS IN THE ADVANCE WARNING AREA MAY BE REDUCED TO 100' ON LOW-SPEED URBAN ROADS (SPEED LIMIT < 40 MPH).
8. IF THIS PLAN IS TO REMAIN IN OPERATION DURING THE HOURS OF DARKNESS, INSTALL BARRICADE WARNING LIGHTS - HIGH INTENSITY ON ALL POST-MOUNTED DIAMOND SIGNS IN THE ADVANCE WARNING AREA.
9. A CHANGEABLE MESSAGE SIGN SHALL BE INSTALLED ONE HALF TO ONE MILE IN ADVANCE OF THE LANE CLOSURE TAPER.
10. SIGN (P) SHALL BE MOUNTED A MINIMUM OF 7 FEET FROM THE PAVEMENT SURFACE TO THE BOTTOM OF THE SIGN.

TABLE 1 - MINIMUM TAPER LENGTHS

POSTED SPEED LIMIT (MILES PER HOUR)	MINIMUM TAPER LENGTH FOR A SINGLE LANE CLOSURE
30 OR LESS	180' (55m)
35	250' (75m)
40	320' (100m)
45	540' (165m)
50	600' (180m)
55	660' (200m)
65	780' (240m)

METRIC CONVERSION CHART (1" = 25mm)

ENGLISH	METRIC	ENGLISH	METRIC	ENGLISH	METRIC
12"	300mm	42"	1050mm	72"	1800mm
18"	450mm	48"	1200mm	78"	1950mm
24"	600mm	54"	1350mm	84"	2100mm
30"	750mm	60"	1500mm	90"	2250mm
36"	900mm	66"	1650mm	96"	2400mm

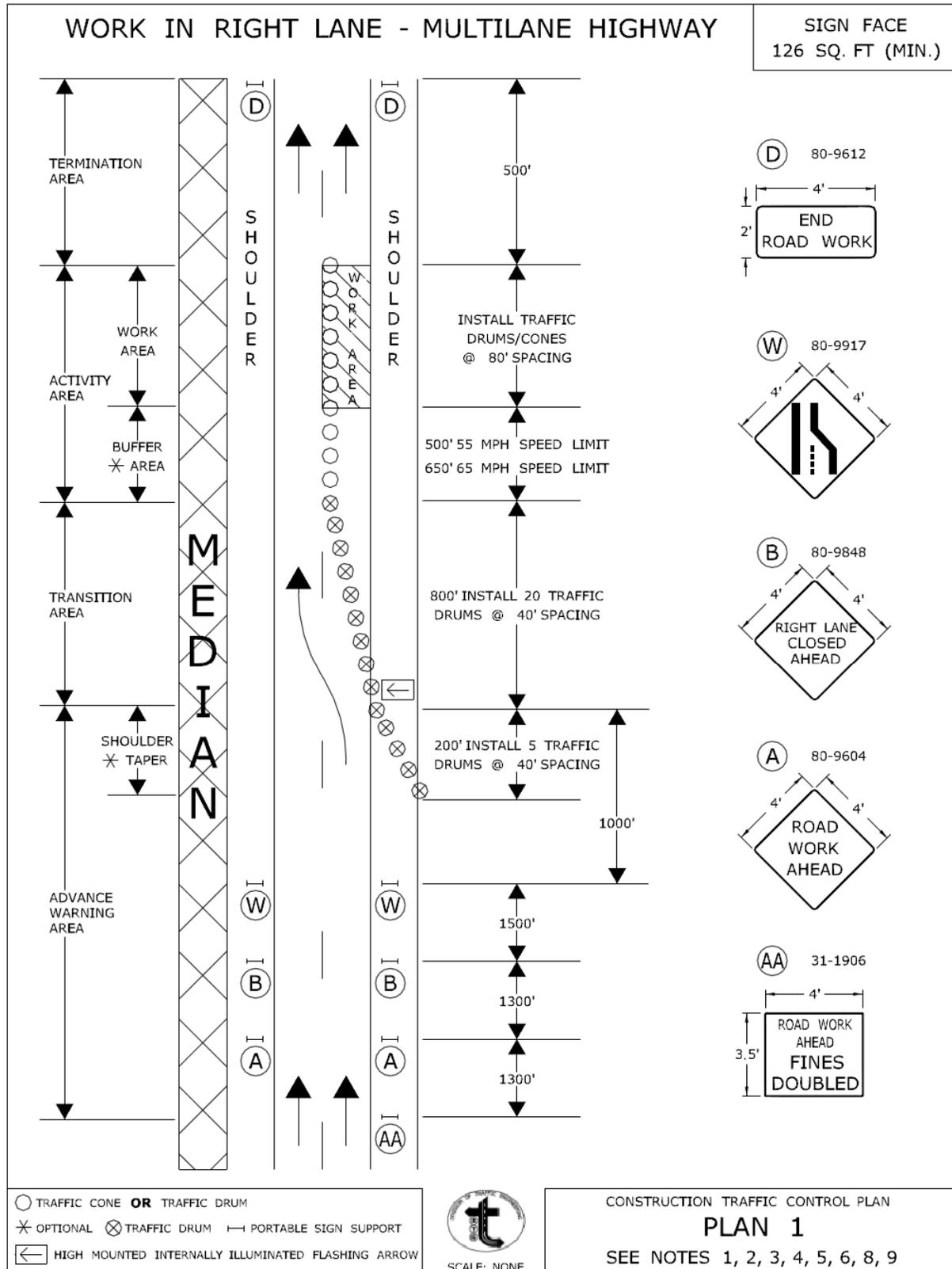


SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN NOTES

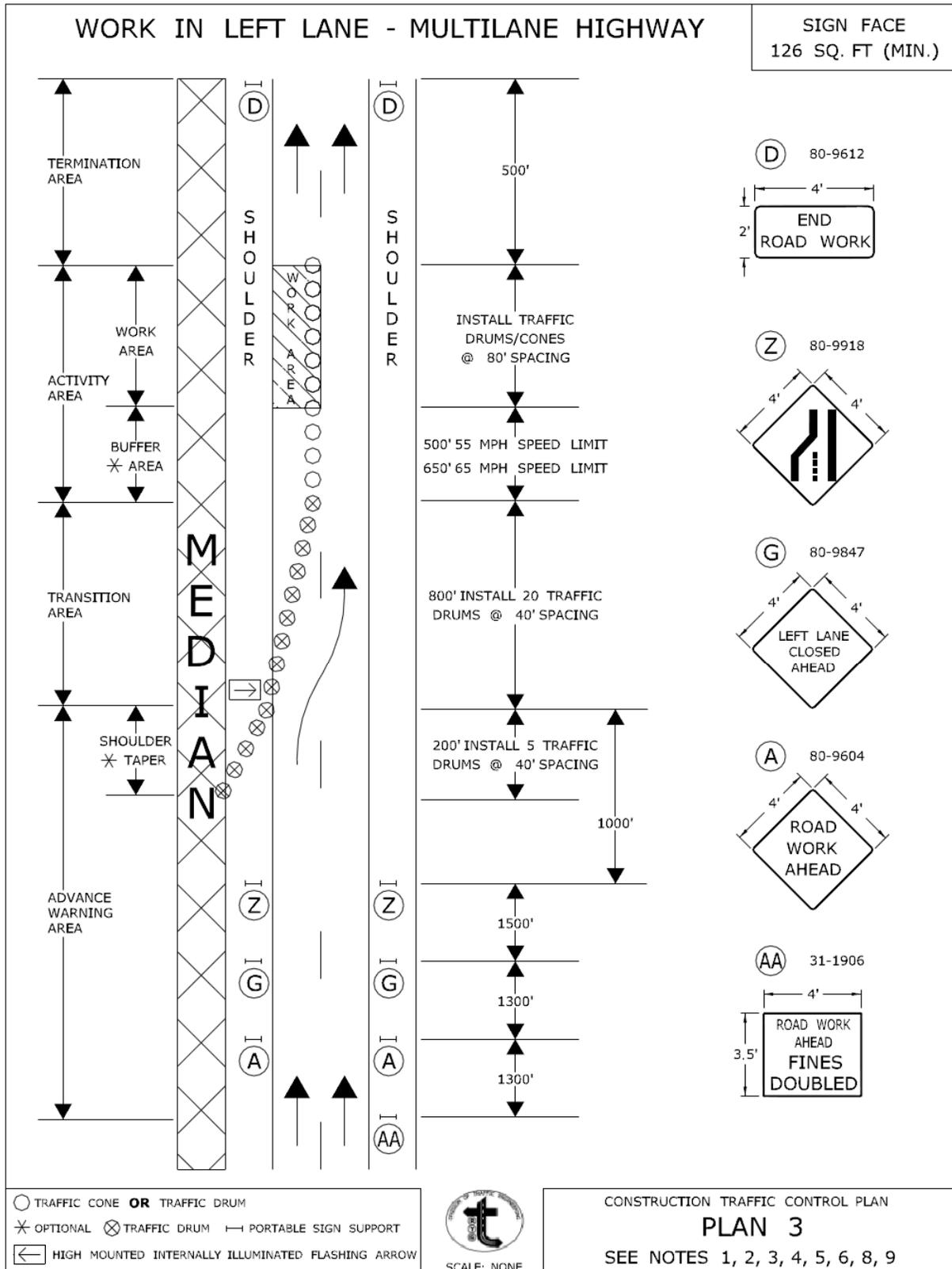
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2012.06.05 15:50:35-0400
PRINCIPAL ENGINEER



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Charles S. Harlow
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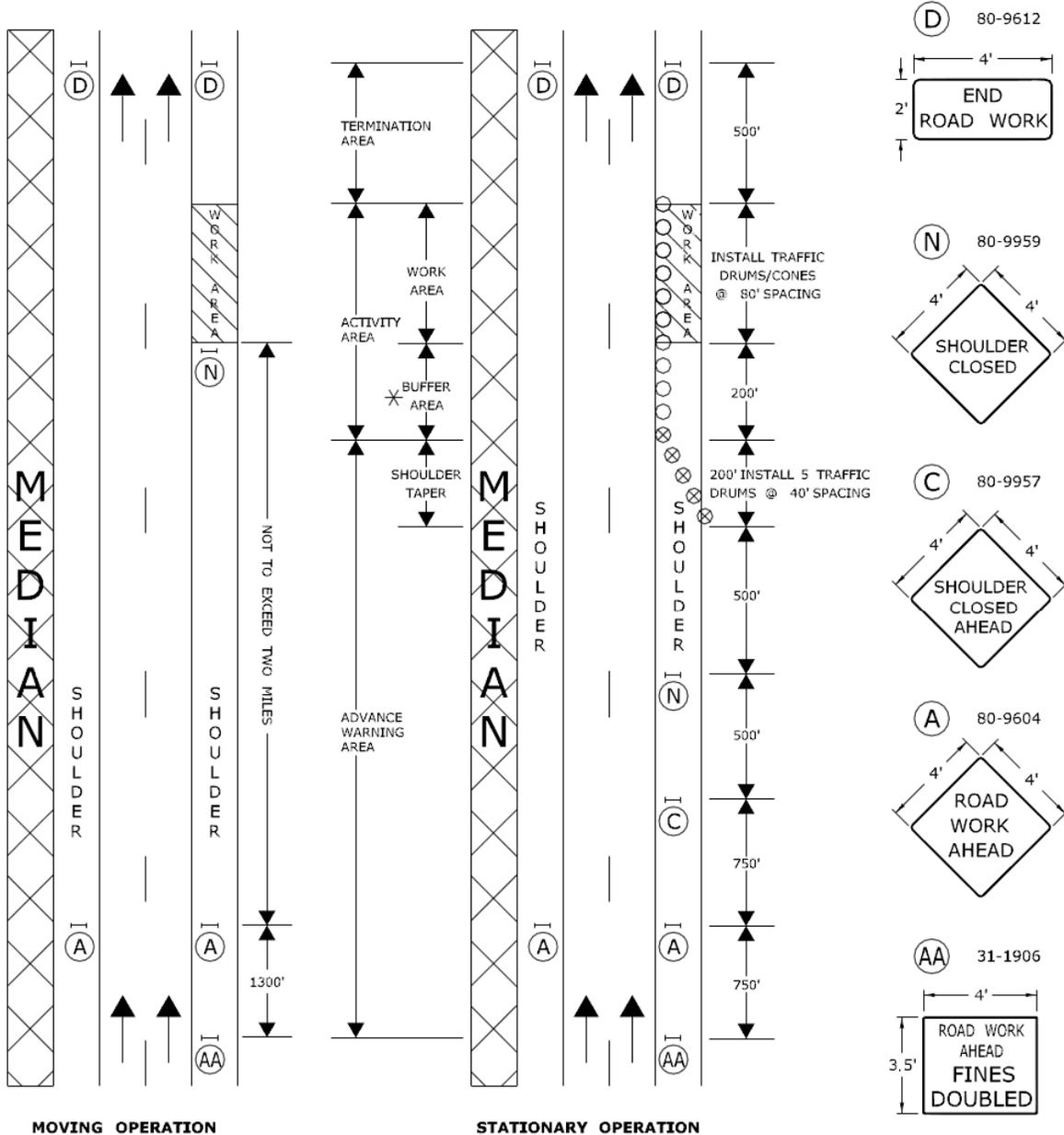


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WORK IN SHOULDER AREA - MULTILANE HIGHWAY

SIGN FACE
94 SQ. FT (MIN.)



- TRAFFIC CONE **OR** TRAFFIC DRUM
- ✱ OPTIONAL ⊗ TRAFFIC DRUM — PORTABLE SIGN SUPPORT
- ◀ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW

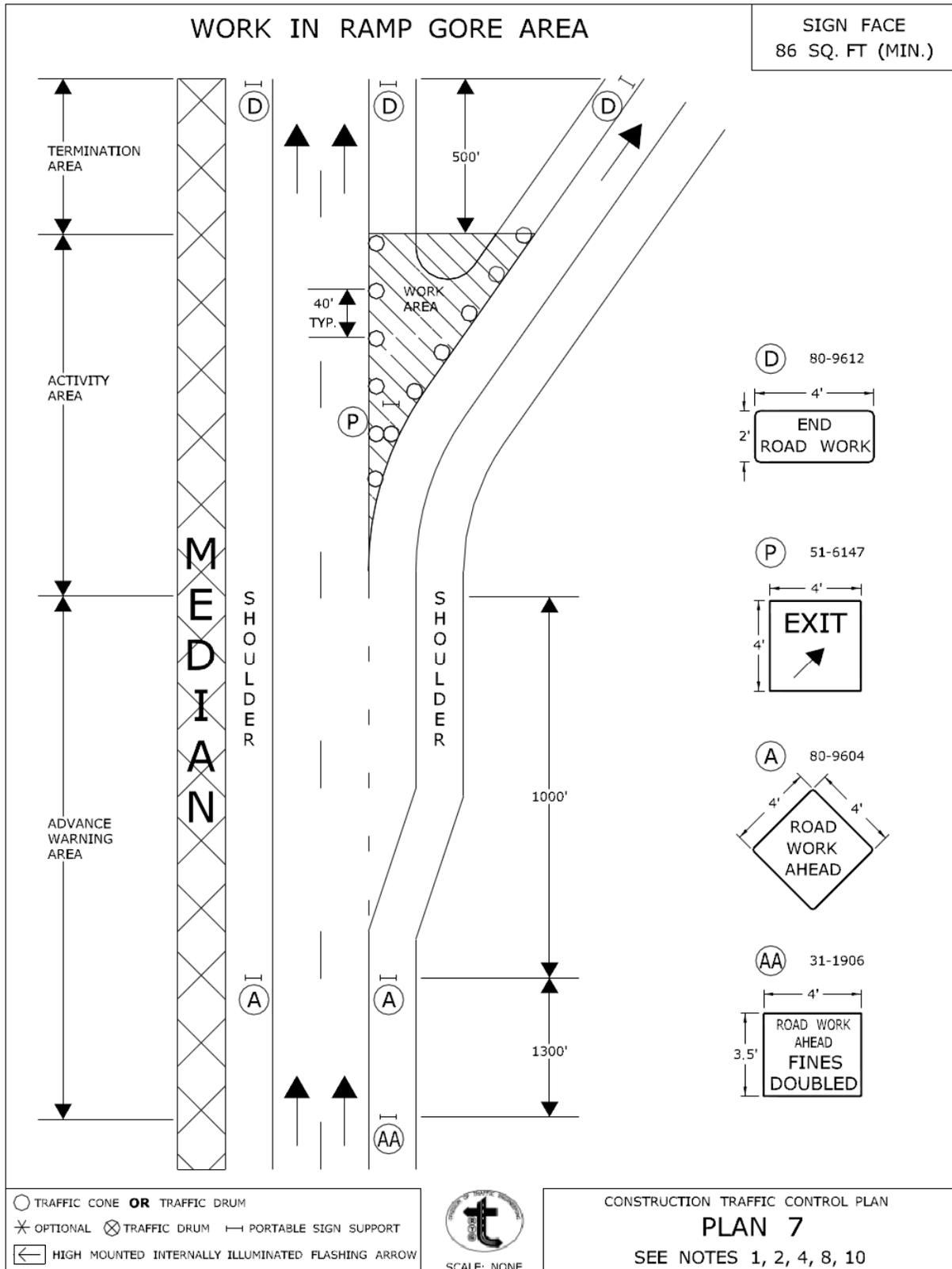


SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 6
SEE NOTES 1, 2, 4, 8

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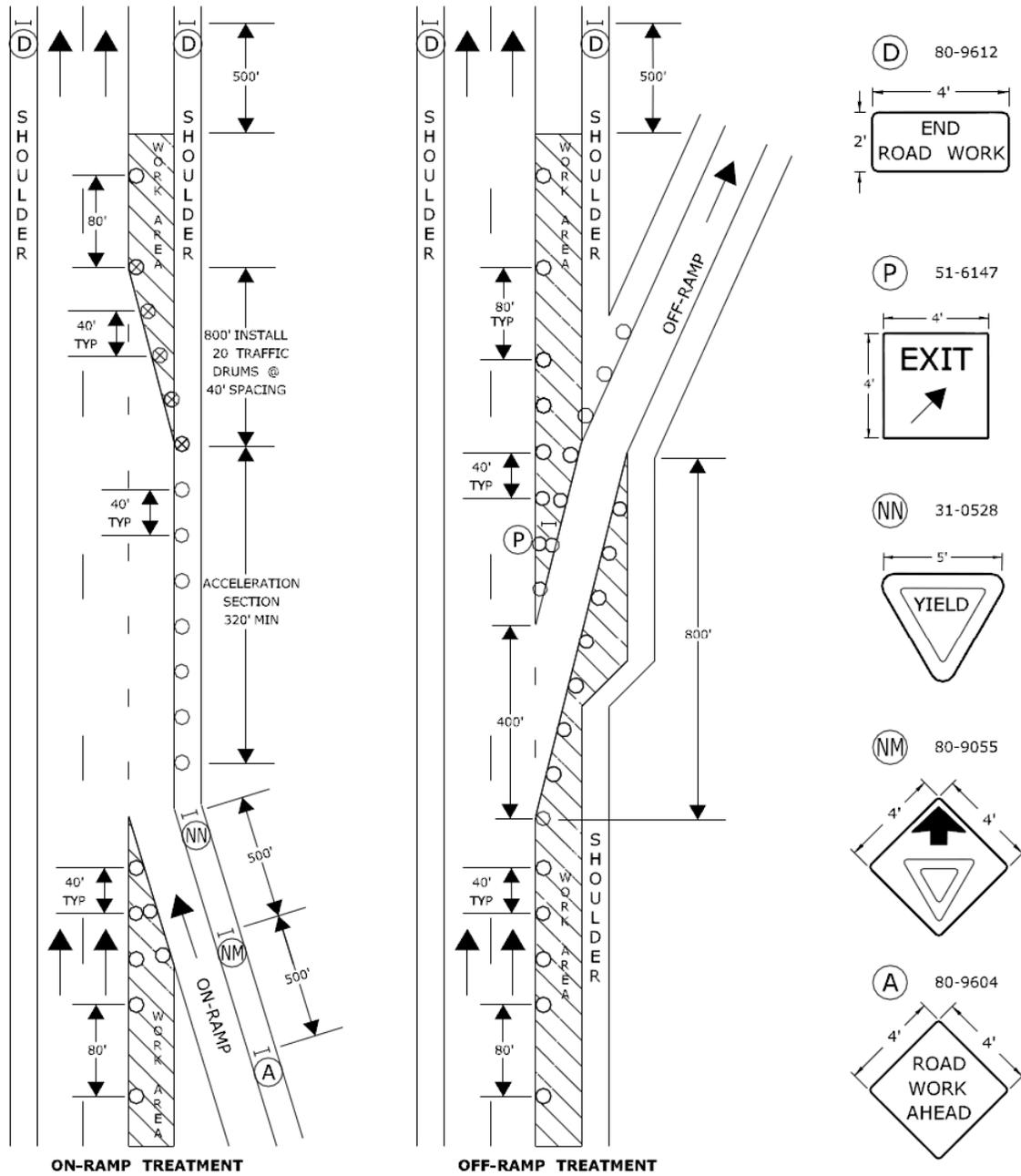
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Charles S. Harlow
2012.06.05 15:53:03-0400

TYPICAL RAMP TREATMENTS FOR MAINLINE LANE CLOSURE - MULTILANE HIGHWAY

SIGN FACE SQ. FT VARIES



ON-RAMP TREATMENT

OFF-RAMP TREATMENT

USE TRAFFIC CONTROL PLAN 1 TO CLOSE THE RIGHT LANE

- TRAFFIC CONE **OR** TRAFFIC DRUM
- ✱ OPTIONAL ⊗ TRAFFIC DRUM — PORTABLE SIGN SUPPORT
- ◀ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW



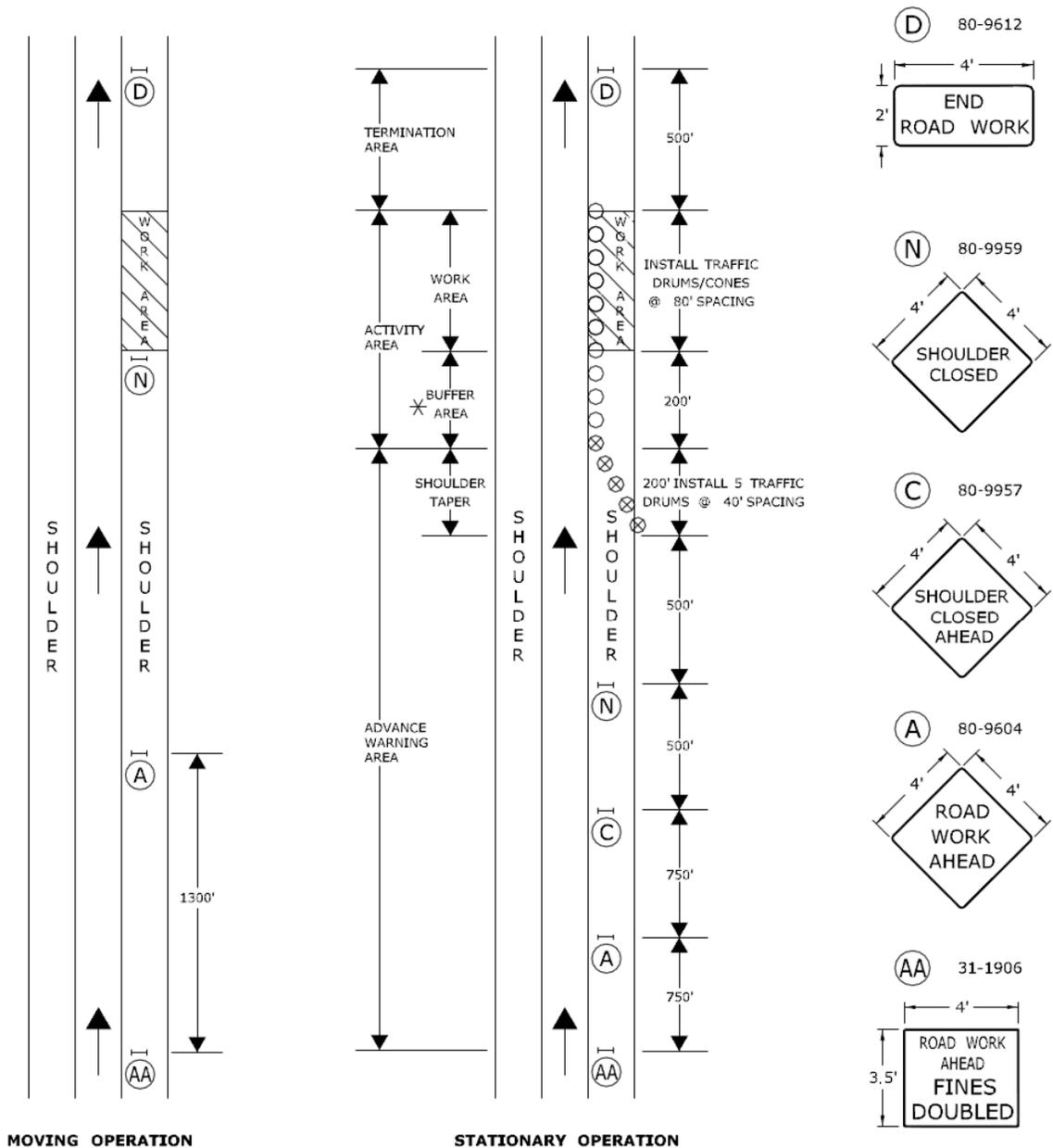
CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 8
 SEE NOTES 1, 2, 3, 4, 5, 6, 8, 9, 10

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WORK IN SHOULDER AREA - TURNING ROADWAYS / RAMPS

SIGN FACE
70 SQ. FT (MIN.)



- TRAFFIC CONE **OR** TRAFFIC DRUM
- ✱ OPTIONAL ⊗ TRAFFIC DRUM — PORTABLE SIGN SUPPORT
- ◀ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW



SCALE: NONE

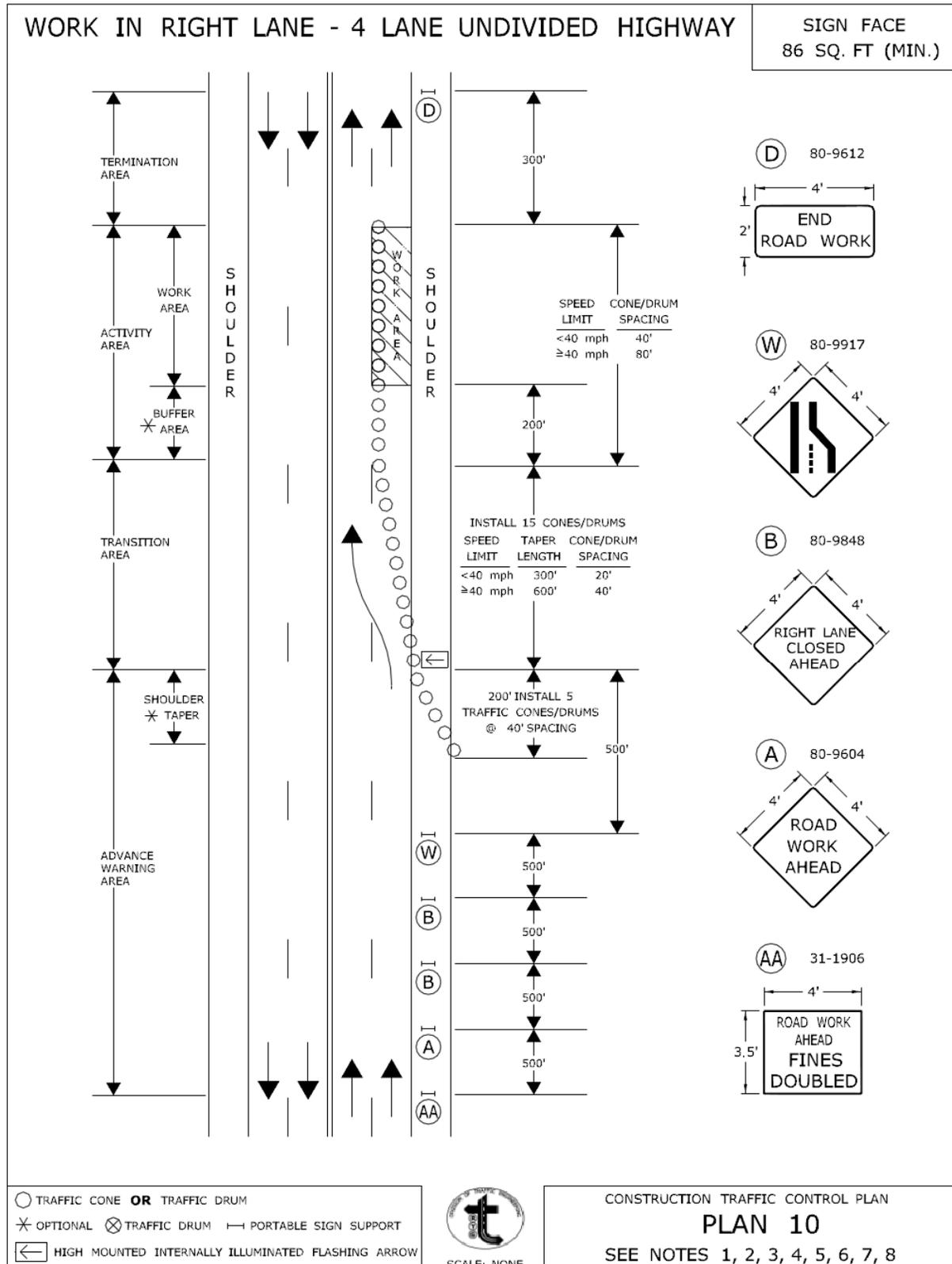
CONSTRUCTION TRAFFIC CONTROL PLAN

PLAN 9

SEE NOTES 1, 2, 4, 8

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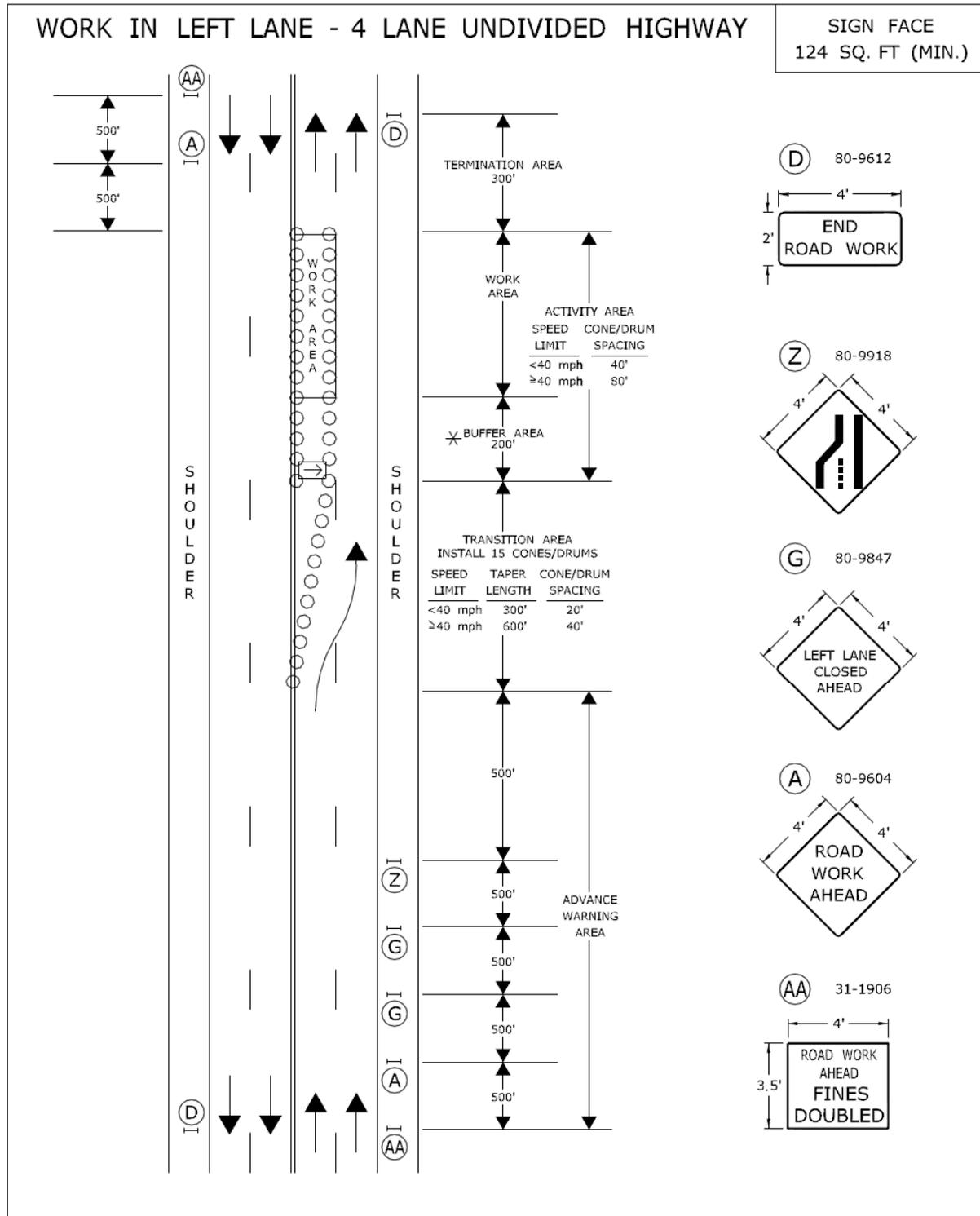
○ TRAFFIC CONE **OR** TRAFFIC DRUM
 ✕ OPTIONAL ✕ TRAFFIC DRUM — PORTABLE SIGN SUPPORT
 HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW



CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 10
 SEE NOTES 1, 2, 3, 4, 5, 6, 7, 8

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 PRINCIPAL ENGINEER



- TRAFFIC CONE **OR** TRAFFIC DRUM
- ✱ OPTIONAL ⊗ TRAFFIC DRUM — PORTABLE SIGN SUPPORT
- ◀ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW



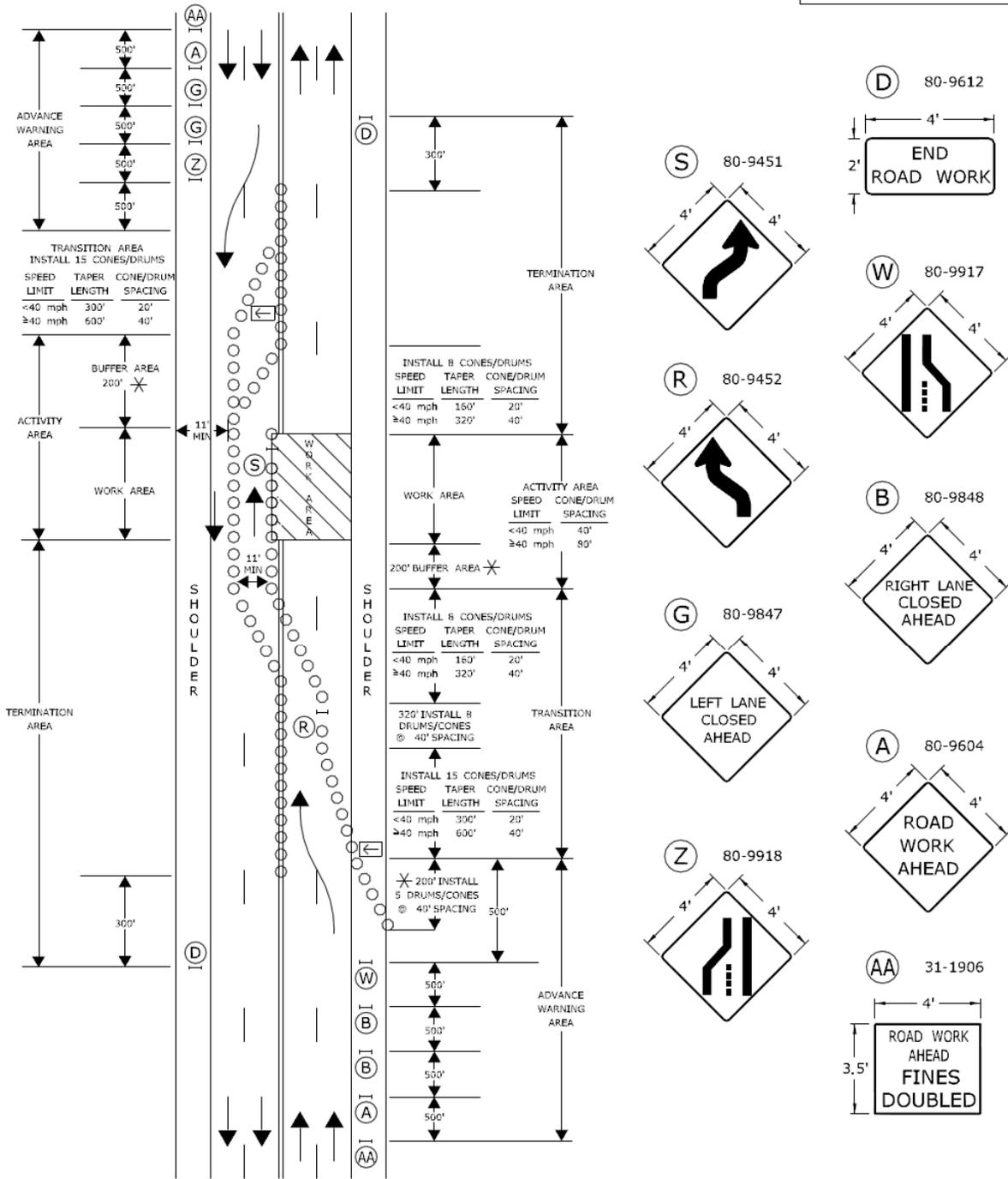
CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 11
SEE NOTES 1, 2, 3, 4, 5, 6, 7, 8

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2012.08.05 15:54:36-0400'

WORK IN BOTH LANES - 4 LANE UNDIVIDED HIGHWAY

SIGN FACE
204 SQ. FT. (MIN.)



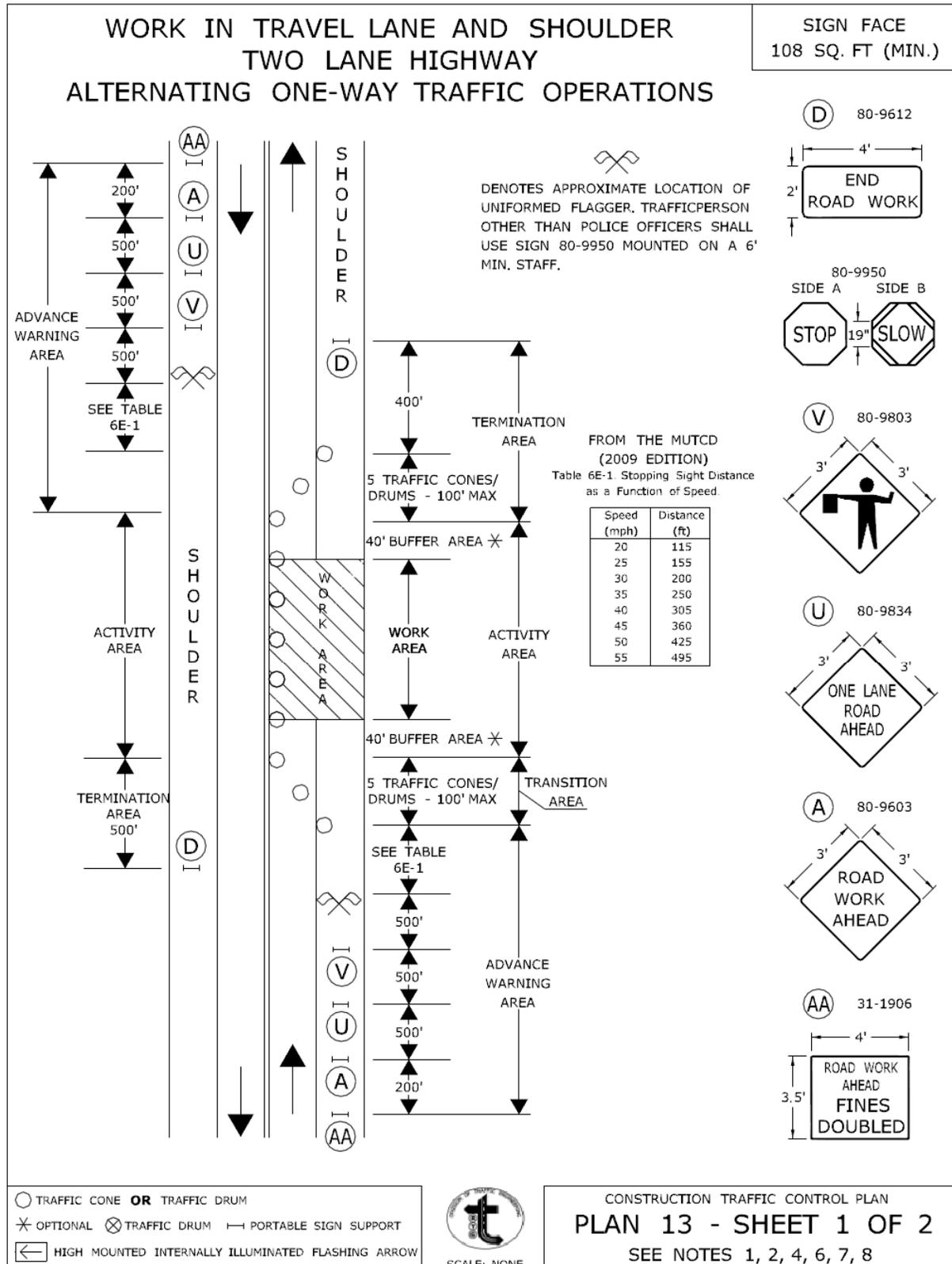
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- ✱ OPTIONAL ⊗ TRAFFIC DRUM — PORTABLE SIGN SUPPORT
- ← HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW



CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 12
SEE NOTES 1, 2, 3, 4, 5, 6, 7, 8

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PRINCIPAL ENGINEER

WORK IN TRAVEL LANE AND SHOULDER TWO LANE HIGHWAY ALTERNATING ONE-WAY TRAFFIC OPERATIONS

SIGN FACE
108 SQ. FT (MIN.)

HAND SIGNAL METHODS TO BE USED BY UNIFORMED FLAGGERS

THE FOLLOWING METHODS FROM SECTION 6E.07, FLAGGER PROCEDURES, IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES," SHALL BE USED BY UNIFORMED FLAGGERS WHEN DIRECTING TRAFFIC THROUGH A WORK AREA. THE STOP/SLOW SIGN PADDLE (SIGN NO. 80-9950) SHOWN ON THE TRAFFIC STANDARD SHEET TR-1220 01 ENTITLED, "SIGNS FOR CONSTRUCTION AND PERMIT OPERATIONS" SHALL BE USED.

A. TO STOP TRAFFIC

TO STOP ROAD USERS, THE FLAGGER SHALL FACE ROAD USERS AND AIM THE STOP PADDLE FACE TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. THE FREE ARM SHALL BE HELD WITH THE PALM OF THE HAND ABOVE SHOULDER LEVEL TOWARD APPROACHING TRAFFIC.



B. TO DIRECT TRAFFIC TO PROCEED

TO DIRECT STOPPED ROAD USERS TO PROCEED, THE FLAGGER SHALL FACE ROAD USERS WITH THE SLOW PADDLE FACE AIMED TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. THE FLAGGER SHALL MOTION WITH THE FREE HAND FOR ROAD USERS TO PROCEED.



C. TO ALERT OR SLOW TRAFFIC

TO ALERT OR SLOW TRAFFIC, THE FLAGGER SHALL FACE ROAD USERS WITH THE SLOW PADDLE FACE AIMED TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. TO FURTHER ALERT OR SLOW TRAFFIC, THE FLAGGER HOLDING THE SLOW PADDLE FACE TOWARD ROAD USERS MAY MOTION UP AND DOWN WITH THE FREE HAND, PALM DOWN.



- TRAFFIC CONE **OR** TRAFFIC DRUM
- * OPTIONAL ⊗ TRAFFIC DRUM — PORTABLE SIGN SUPPORT
- ◀ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW

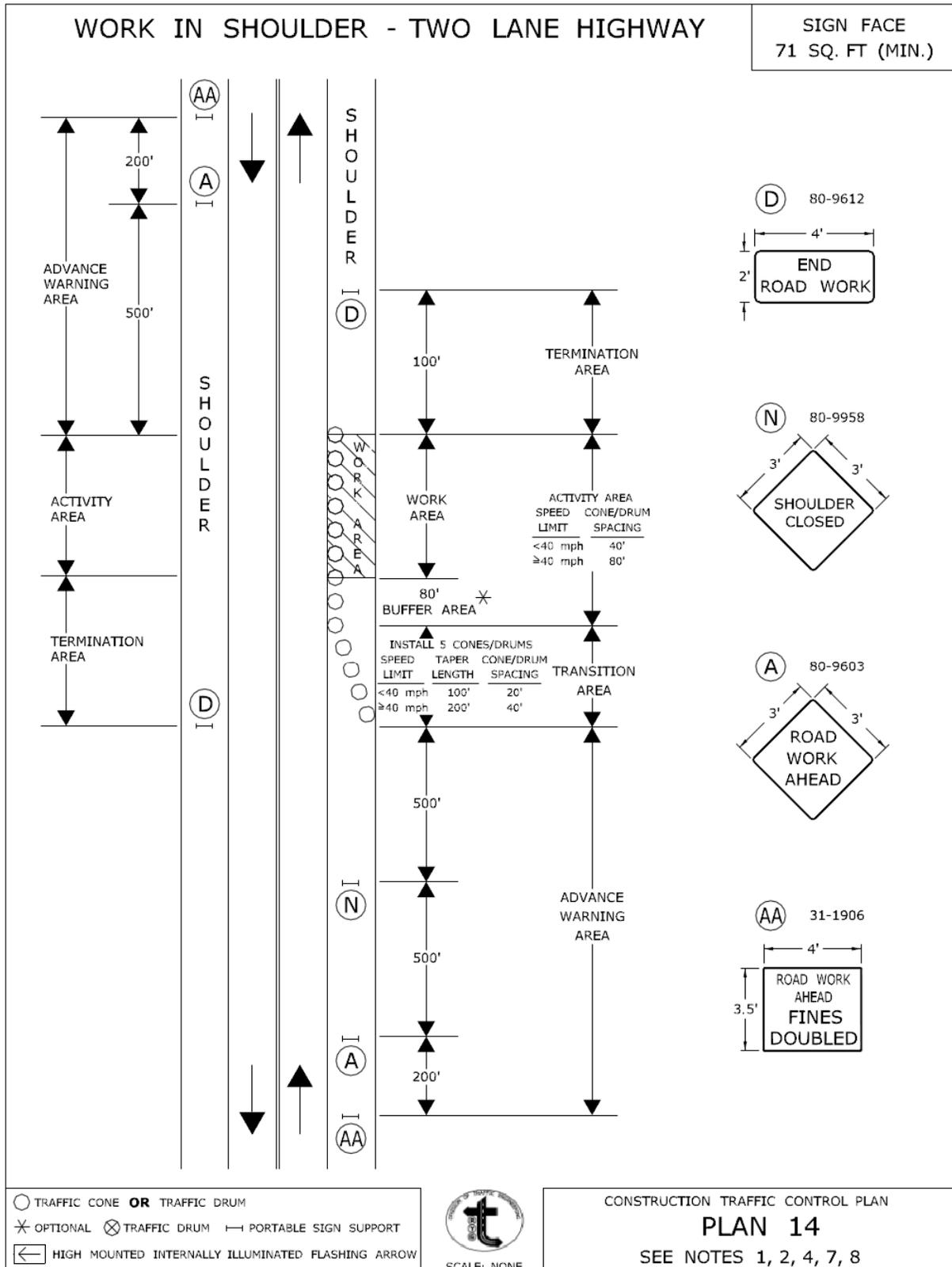


SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 13 - SHEET 2 OF 2
SEE NOTES 1, 2, 4, 6, 7, 8

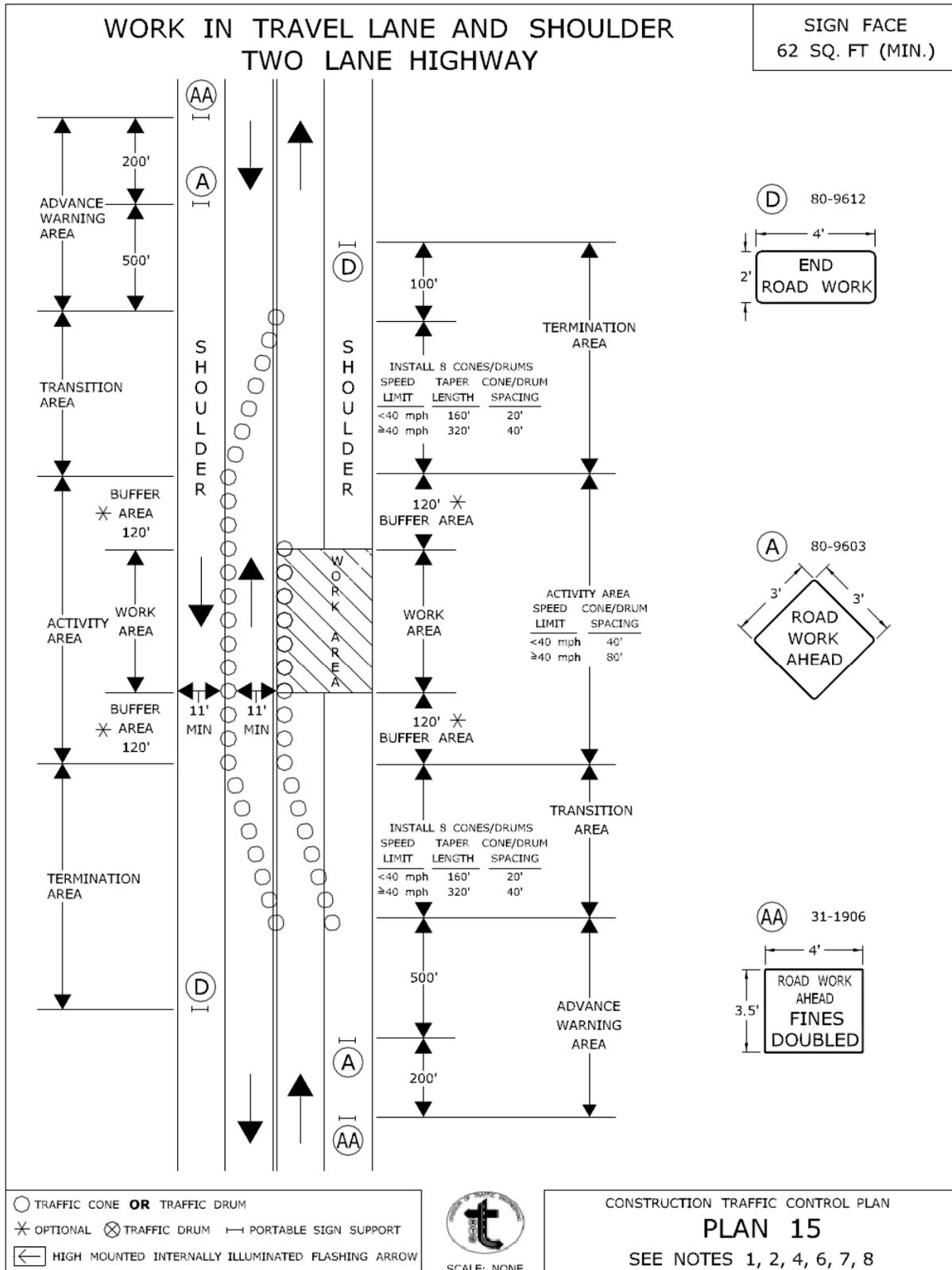
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BUREAU OF ENGINEERING & CONSTRUCTION

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2012.06.05 15:55:45-04'00'
PRINCIPAL ENGINEER



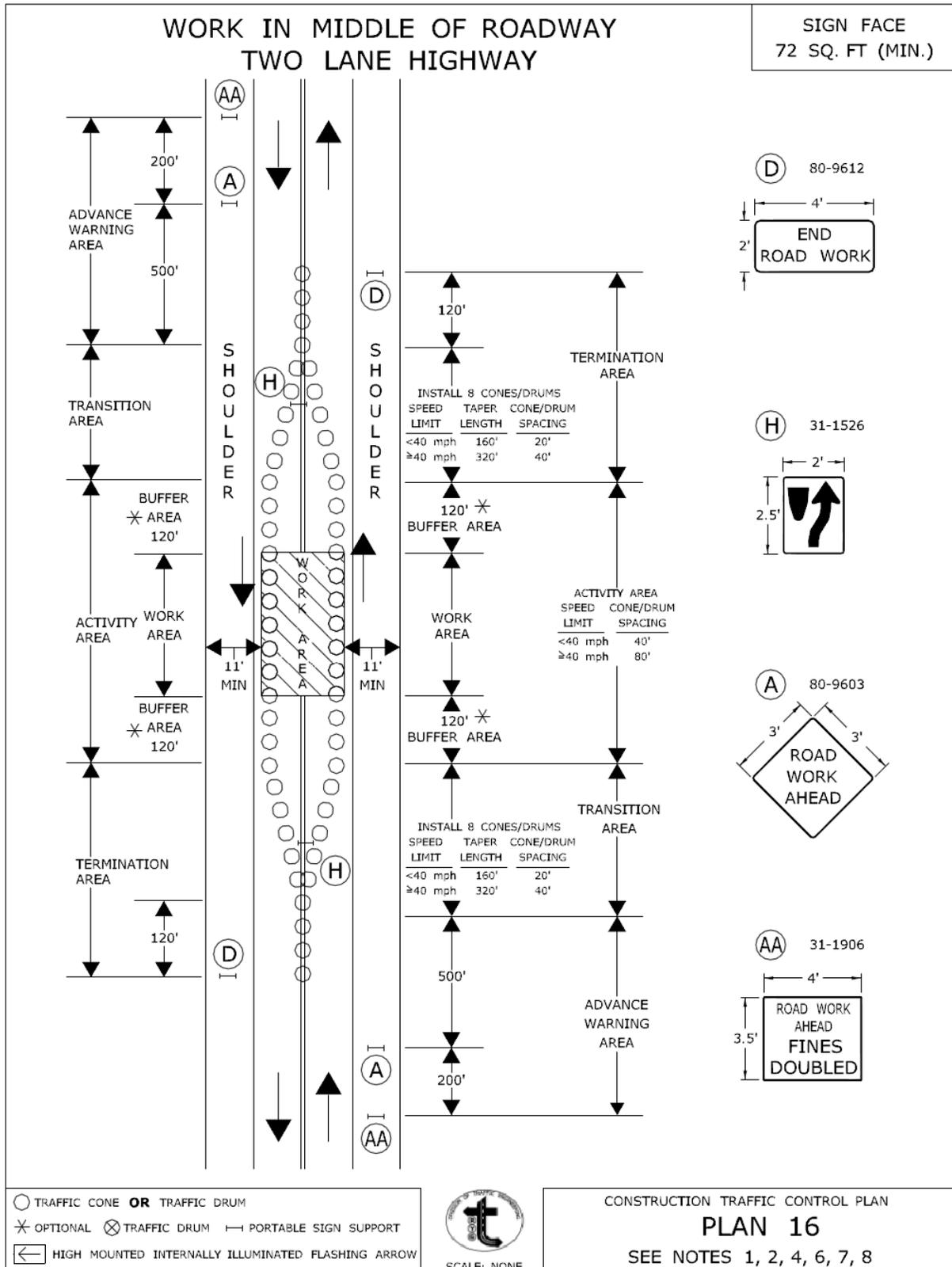
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BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED *Charles S. Harlow*
 Charles S. Harlow
 2012.06.05 15:56:09-04'00"
 PRINCIPAL ENGINEER



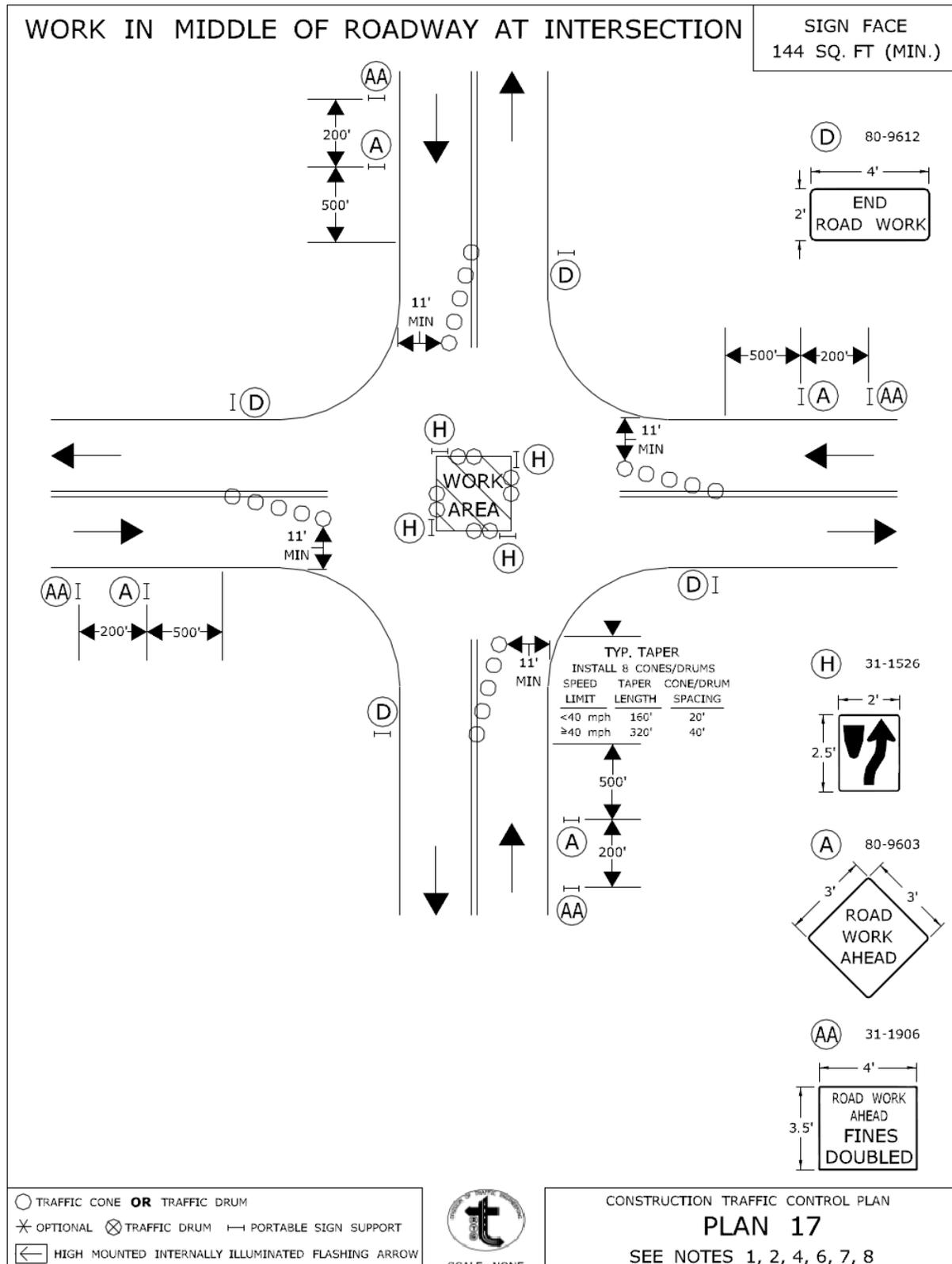
CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED *Charles S. Harlow* Charles S. Harlow
2012.06.05 15:56:29-04'00"
PRINCIPAL ENGINEER



CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED *Charles S. Harlow*
Charles S. Harlow
2012.08.05 15:56:51-04'00"
PRINCIPAL ENGINEER



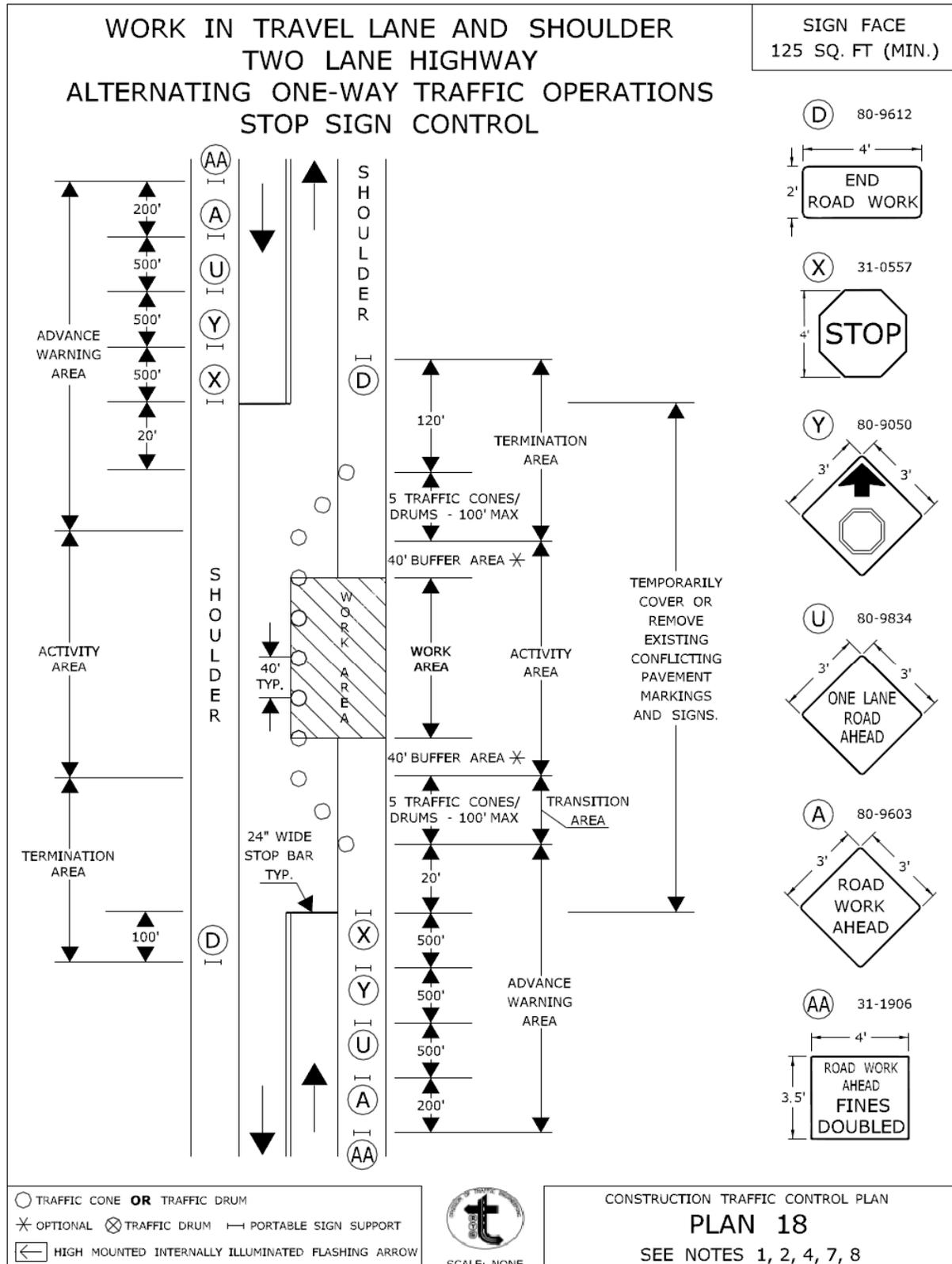
○ TRAFFIC CONE **OR** TRAFFIC DRUM
 ✱ OPTIONAL ⊗ TRAFFIC DRUM — PORTABLE SIGN SUPPORT
 ⇐ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW



CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 17
 SEE NOTES 1, 2, 4, 6, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION
 BUREAU OF ENGINEERING & CONSTRUCTION

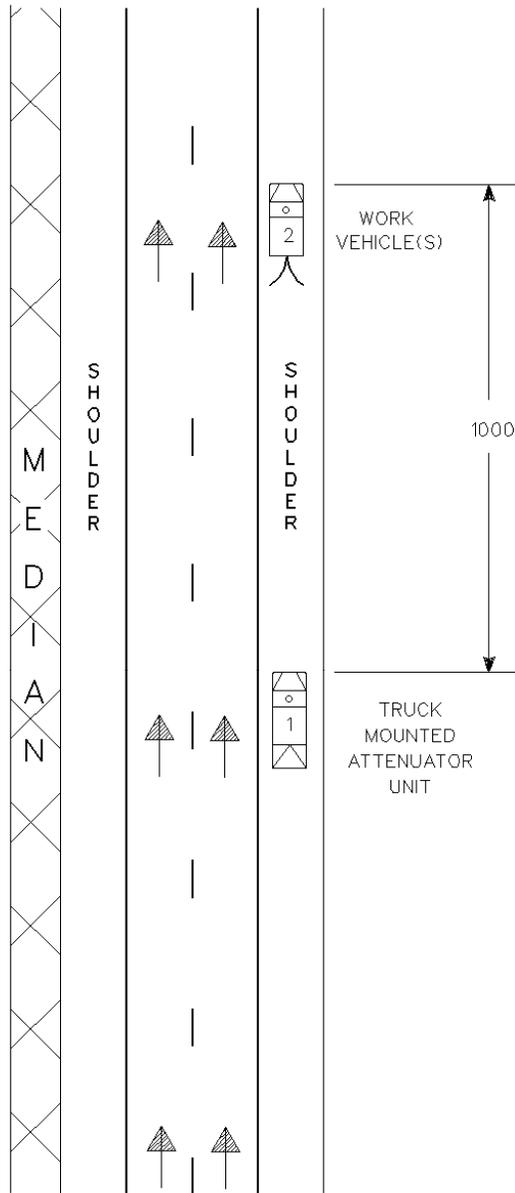
APPROVED *Charles S. Harlow*
 PRINCIPAL ENGINEER
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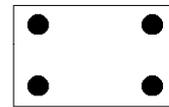
CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED *Charles S. Harlow* Charles S. Harlow
2012.06.05 15:57:37-0400
PRINCIPAL ENGINEER

MOVING OPERATION ON RIGHT SHOULDER
MULTILANE HIGHWAY & SECONDARY ROADWAYS



SIGN MOUNTED ON TRUCK 1



DEPARTMENT APPROVED
ARROW BOARD
(FLASHING YELLOW MODE)

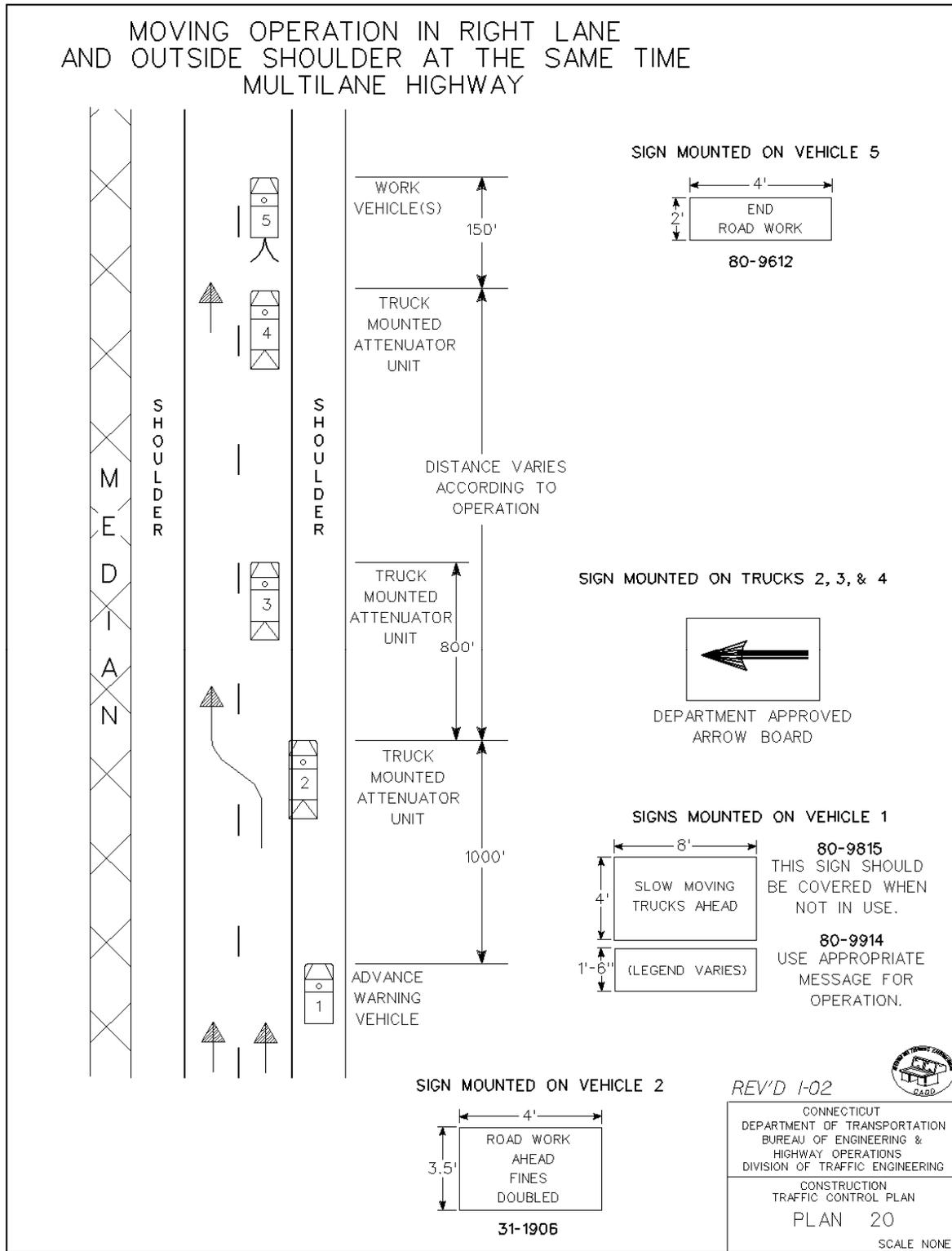
REV'D 1-02



CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING &
HIGHWAY OPERATIONS
DIVISION OF TRAFFIC ENGINEERING

CONSTRUCTION
TRAFFIC CONTROL PLAN
PLAN 19
SCALE NONE

APPROVED J. McCall DATE 1-30-02
PRINCIPAL ENGINEER



REV'D I-02

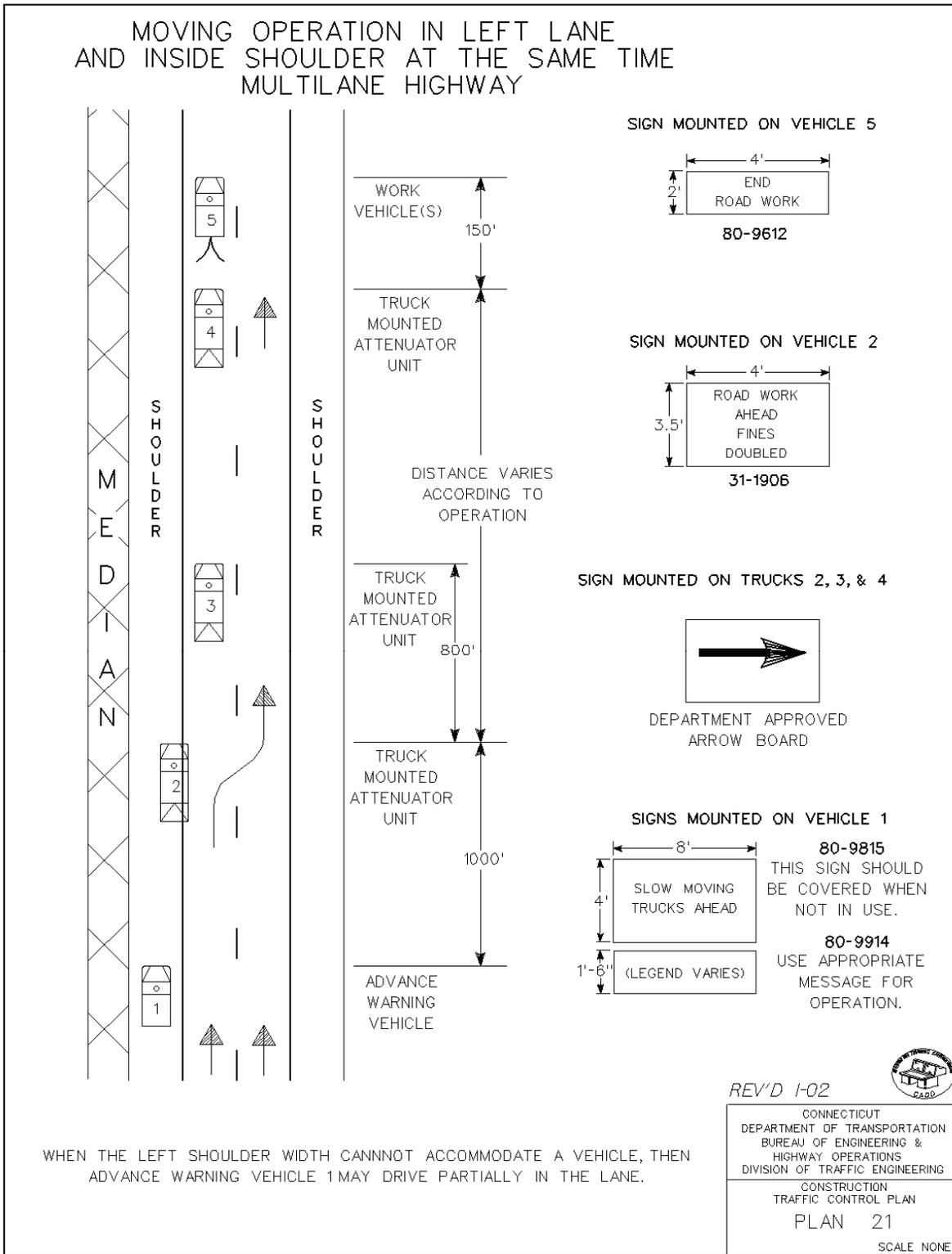


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HIGHWAY OPERATIONS
DIVISION OF TRAFFIC ENGINEERING

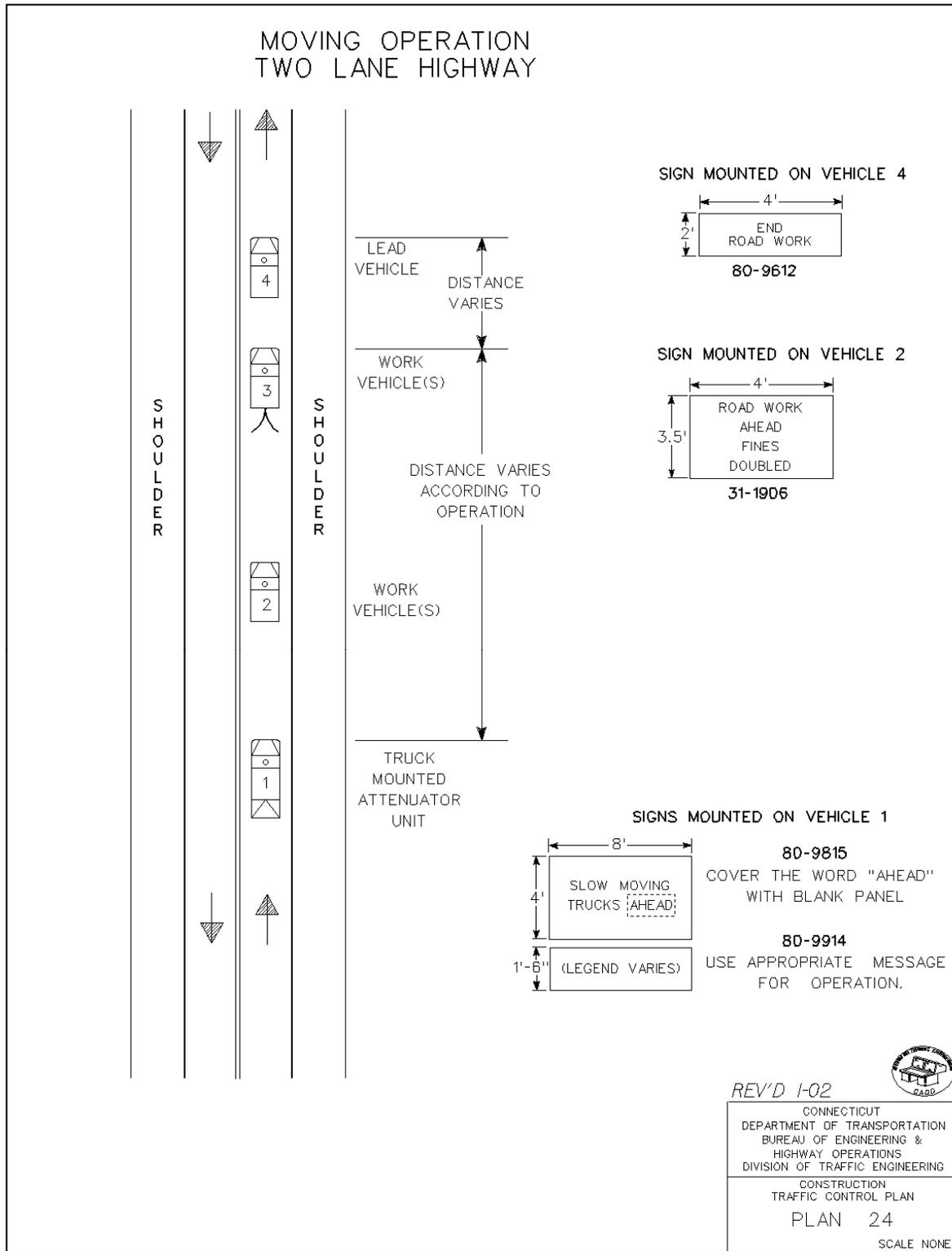
CONSTRUCTION
TRAFFIC CONTROL PLAN
PLAN 20

SCALE NONE

APPROVED John D. McCall DATE I-30-02
PRINCIPAL ENGINEER



APPROVED John D. McCall DATE I-30-02
 PRINCIPAL ENGINEER



REV'D 1-02

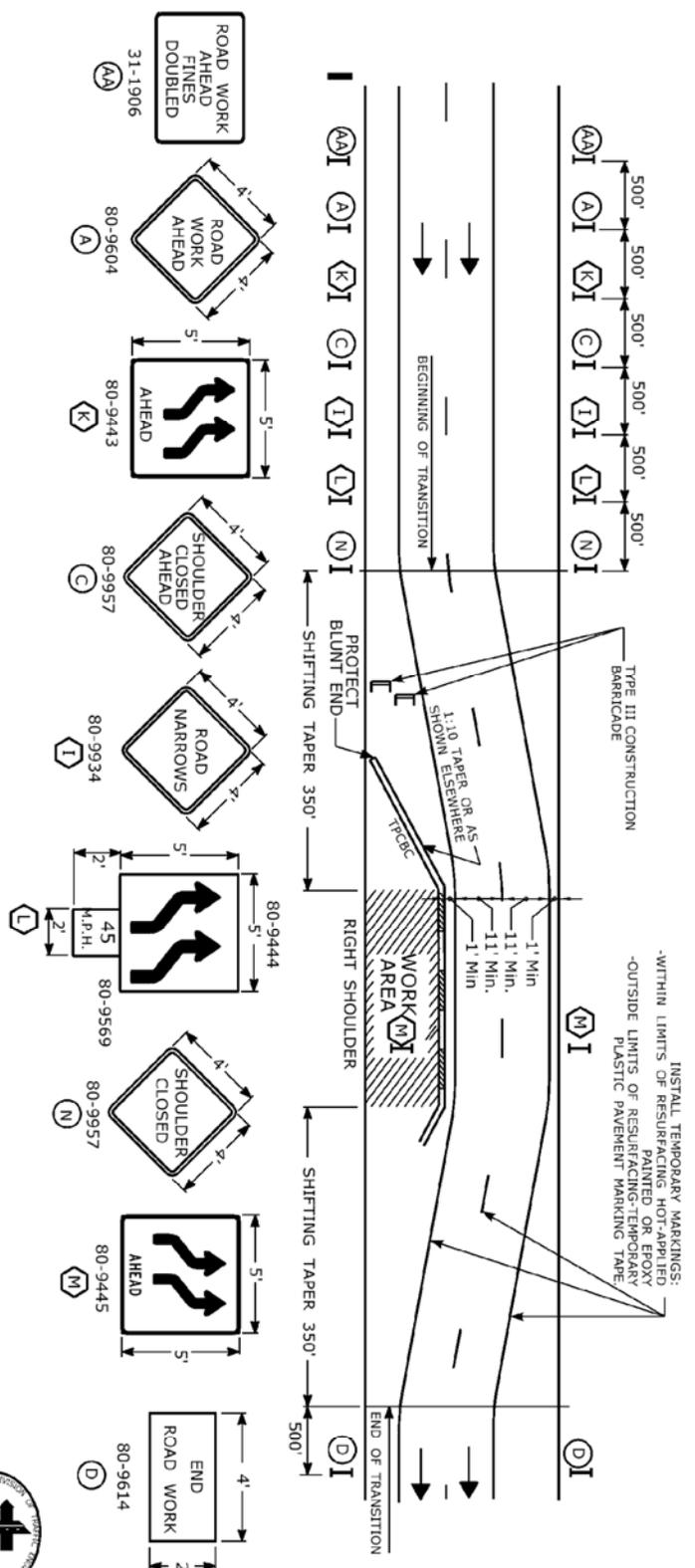


CONNECTICUT
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HIGHWAY OPERATIONS
DIVISION OF TRAFFIC ENGINEERING

CONSTRUCTION
TRAFFIC CONTROL PLAN
PLAN 24
SCALE NONE

APPROVED John D. McCall DATE 1-30-02
PRINCIPAL ENGINEER

**TRAFFIC CONTROL PLAN
(RTE.15 NORTHBOUND AND SOUTHBOUND)
RIGHT SHOULDER INSTALLATION**



INSTALL TEMPORARY MARKINGS:
 - WITHIN LIMITS OF RESURFACING HOT-APPLIED PAINTED OR EPOXY
 - OUTSIDE LIMITS OF RESURFACING-TEMPORARY PLASTIC PAVEMENT MARKING TAPE

1. ALL POST MOUNTED SIGNS, EXCEPT (C) SHALL HAVE BARRICADE WARNING LIGHTS (HIGH INTENSITY)
2. SIGNS (L, I, & M) SHALL BE POST MOUNTED EXCEPT WHEN BEHIND T.P.C.B.C. OTHER SIGNS TO BE POST MOUNTED WHERE POSSIBLE.
3. CONFLICTING PAVEMENT MARKINGS WITHIN LIMITS OF RESURFACING SHALL BE REMOVED. CONFLICTING PAVEMENT MARKINGS OUTSIDE OF LIMITS OF RESURFACING SHALL BE COVERED WITH BLACK LINE MASK PAVEMENT MARKING TAPE. COVER OR REMOVE CONFLICTING MARKINGS OUTSIDE TRAVEWAY.
4. WIDTHS OF TRAVEL LANES AND SHOULDERS SHOWN ELSEWHERE.

MESSAGE NO. 1 MESSAGE NO. 2
 LANE SHIFT LEFT | LANE REDUCE SPEED
 CHANGEABLE MESSAGE SIGN

FILENAME : ... \TR_MSH RTE15_MPT(TYP_lane_shifts_median & rt_sh).dgn

SCALE - NONE

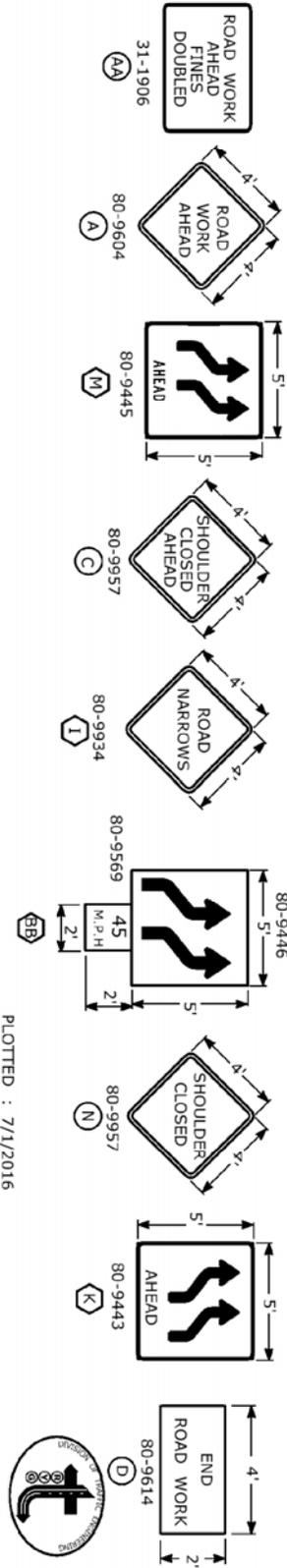
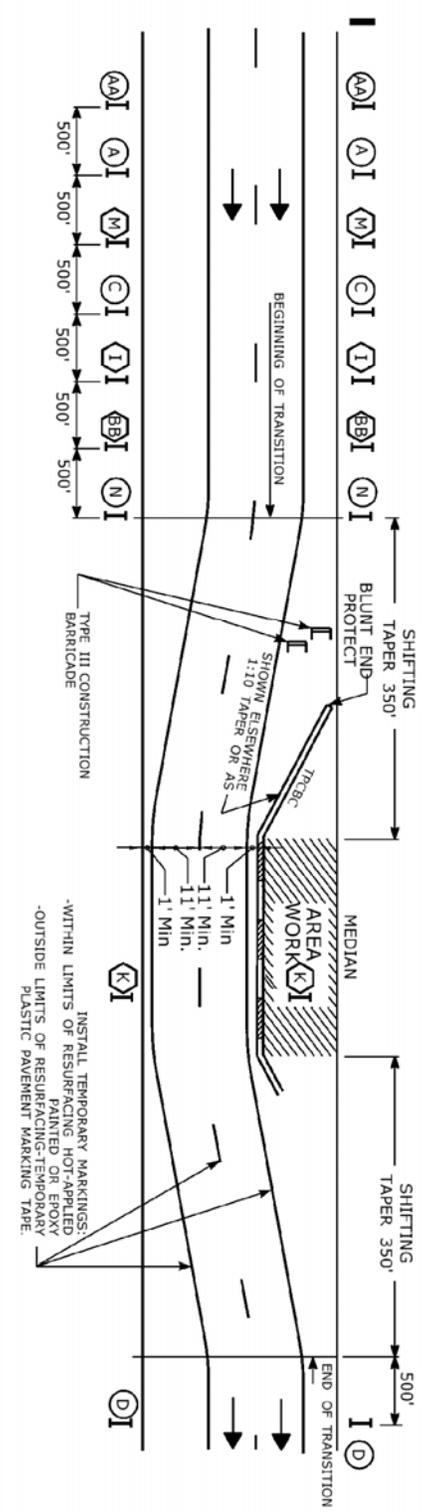
PLOTTED : 7/1/2016



**CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUR. OF ENGINEERING & CONSTRUCTION
DIVISION OF TRAFFIC ENGINEERING**

SUBMITTED <u>J. Massini</u> DATE <u>June 2016</u>	APPROVED <u>L. Conroy</u> DATE <u>June 2016</u>
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**TRAFFIC CONTROL PLAN
(RTE.15 NORTHBOUND AND SOUTHBOUND)
MEDIAN WORK AND DRAINAGE INSTALLATION**



1. ALL POST MOUNTED SIGNS, EXCEPT (D) SHALL HAVE BARRICADE WARNING LIGHTS (HIGH INTENSITY)
2. SIGNS (V), (BB) & (K) SHALL BE POST MOUNTED EXCEPT WHEN BEHIND T.P.C.B.C. OTHER SIGNS TO BE POST MOUNTED WHERE POSSIBLE.
3. CONFLICTING PAVEMENT MARKINGS WITHIN LIMITS OF RESURFACING SHALL BE REMOVED. CONFLICTING PAVEMENT MARKINGS OUTSIDE OF LIMITS OF RESURFACING SHALL BE COVERED WITH BLACK LINE MASK PAVEMENT MARKING TAPE. COVER OR REMOVE CONFLICTING MARKINGS OUTSIDE TRAVELWAY.
4. WIDTHS OF TRAVEL LANES AND SHOULDERS SHOWN ELSEWHERE.

MESSAGE NO. 1 MESSAGE NO. 2
 LANE SHIFT RIGHT
 REDUCE SPEED
 CHANGEABLE MESSAGE SIGN

FILENAME : ... \TR_MSH_RTE15_MPT(tp_lane_shifts_median & rt.sh).dgn

SCALE - NONE

CONNECTICUT
 DEPARTMENT OF TRANSPORTATION
 BUR. OF ENGINEERING & CONSTRUCTION
 DIVISION OF TRAFFIC ENGINEERING

PLOTTED : 7/1/2016

DRAWN BY: J. Massini DATE: June 2016
 CHECKED BY: L. Conroy DATE: June 2016

Article 9.71.05 – Basis of Payment is supplemented by the following:

The temporary relocation of signs and supports, and the furnishing, installation and removal of any temporary supports shall be paid for under the item “Maintenance and Protection of Traffic”. Temporary overhead sign supports and foundations shall be paid for under the appropriate item(s).

The cost of furnishing, installing, and removing the material for the 4H:1V traversable slope shall be paid for under the item “Maintenance and Protection of Traffic.”

ITEM #0973725A - WORKSITE TRAFFIC SUPERVISOR (MINIMUM BID)

Description:

Under this item the Contractor shall furnish the services of certified personnel to act as the “Worksite Traffic Supervisor(s)”, the “MPT Coordinator(s)” and the “MPT Supervisor” for the project. Also under this item, the Contractor shall perform all necessary operations related to Maintenance and Protection of Traffic with reports documenting the same, as detailed in this item.

The “Worksite Traffic Supervisor(s)” shall be present, on site, each workday/work shift that traffic control signing and devices are in place on any roadway on the project. The “Worksite Traffic Supervisor(s)” shall be responsible for the satisfactory performance of all duties/requirements listed herein, and as directed by the Engineer.

The “MPT Coordinator(s)” shall be responsible for the overall project coordination and managing the work efforts of the “Worksite Traffic Supervisor(s)” and all reporting requirements and work activities covered under this item. The “MPT Coordinator(s)” shall be responsible for the satisfactory performance and/or supervision of all duties/requirements listed herein, and as directed by the Engineer.

The “MPT Supervisor” shall be a member of the Contractor’s management staff and will provide oversight to the activities performed by the “Worksite Traffic Supervisor(s)” and the “MPT Coordinator(s)”. The “MPT Supervisor” shall assist with resolving any outstanding MPT issues and shall report on outstanding MPT issues at the bi-weekly progress meetings.

The “MPT Coordinator(s)” and “Worksite Traffic Supervisor(s)” must be certified through the American Traffic Safety Services Association (ATSSA) as a “Worksite Traffic Supervisor” or a similar training course acceptable to the Department. The individuals must have taken the course, passed the exam and have certification or have applied for certification in order to be accepted or conditionally accepted for this position by the Department. If not already certified, certification must be obtained within three (3) months of conditional acceptance by the Department. Certification must be maintained by the individuals acting as the “MPT Coordinator(s)” and “Worksite Traffic Supervisor(s)” throughout the duration of the project. The “MPT Coordinator(s)” and “MPT Supervisor” must be members of the Contractor’s staff. The personnel certified as “Worksite Traffic Supervisor(s)” may be a member of the Contractor’s staff or a subcontractor.

The “Worksite Traffic Supervisor(s)”, “MPT Coordinator(s)”, and the “MPT Supervisor” shall be designated by name(s), in writing with a resume of qualifications, within sixty (60) calendar days after Award of the Contract and shall not be changed without prior written notice to the Engineer.

The Contractor shall not be allowed to implement traffic control signing patterns and/or otherwise place traffic control devices for temporary lane and/or shoulder closures, temporary traffic shifts, or temporary detours required to complete construction operations on any roadway on the project unless a certified “Worksite Traffic Supervisor” is present on site and all requirements of this specification are met to the satisfaction and approval of the Engineer.

The minimum lump sum bid for this item shall be \$300,000 (three hundred thousand dollars). Failure of the Contractor to bid at least the minimum amount will result in the Department adjusting the Contractor’s bid to include the specified minimum bid amount for this item.

Construction Methods:

Work under this item requires that the “Worksite Traffic Supervisor(s)” shall be present, on site, during all hours that traffic control signing patterns for temporary lane and/or shoulder closures, temporary traffic shifts and temporary detours required to complete construction operations are in place on any roadway on the project. The “Worksite Traffic Supervisor(s)” shall monitor/inspect the temporary traffic control signing patterns, a minimum of four (4) times per shift and assure implementation of any necessary corrective measures as required.

If a designated “Worksite Traffic Supervisor(s)” is not available to perform the required duties indicated herein due to circumstances beyond the control of the Contractor (i.e. illness or other absence), the “MPT Coordinator(s)” shall act in behalf of the “Worksite Traffic Supervisor(s)” and shall fulfill all required duties of the “Worksite Traffic Supervisor(s)”. The Contractor shall notify the Engineer of the substitution of personnel within one (1) hour of the start of the work shift. During other working periods, the “Worksite Traffic Supervisor(s)” shall inspect all installed traffic control signing patterns, signs and supports, traffic cones and drums, barricade warning lights, illuminated flashing arrows and changeable message signs, and other traffic control devices and pavement markings in use on the project a minimum of once every work shift.

During non-work days, i.e. weekend day and designated holidays, etc. the “Worksite Traffic Supervisor(s)” shall inspect all installed traffic control signing patterns, signs and supports, traffic cones and drums, barricade warning lights, illuminated flashing arrows and changeable message signs, and other traffic control devices and pavement markings in use on the project a minimum of once every non-work day.

The inspections of the traffic control installations required under this item shall be for conformance with the plans and special provisions including but not limited to the Special Provisions “Maintenance & Protection of Traffic” and “Section 1.08 – Prosecution and Progress”, the Maintenance and Protection of Traffic Plans, Department Standards, and MUTCD requirements.

The duties to be fulfilled by personnel assigned to this item shall include, but are not limited to, the following:

- Proper placement of the temporary traffic control signing patterns, signs and supports, traffic cones and drums, barricade warning lights, illuminated flashing arrows and changeable signs,

and other traffic control devices and pavement markings in conformance with the traffic control plans included in the Special Provision, "Maintenance and Protection of Traffic".

- Review traffic control signing patterns and submit for acceptance any recommended revisions, as required to meet the actual site/field conditions, prior to implementing the traffic control signing pattern.
- Assure that any deficiencies caused by the Contractor's operations or the traveling public in the installation of all traffic control devices including construction signing patterns, signs, sign supports, pavement markings barriers and barricades, and all appurtenances in use on the project are corrected by the Contractor's forces immediately in a manner so not to interfere with traffic.
- Inspect and notify the Engineer of any deficiencies to traffic-related mechanical devices in use on the project and assure that the appropriate corrective actions are taken.
- Perform a monthly inventory of all traffic control devices including construction signing, sign supports, cones, drums, barriers and barricades, and other appurtenances in use on the project to assure compliance with the "Quality Standards for Work Zone Traffic Control Devices" as published by ATSSA. Assure the removal from service all "marginal" or "unacceptable" devices.
- Monitor and enforce compliance by workers in the wearing of high visibility protective clothing and other safety related clothing.
- Monitor work zone signing and safety practices of all personnel on the project, including subcontractors, to ensure their compliance with work zone safety requirements.
- Conduct weekly inspections with the Engineer of all traffic control devices including construction signing patterns, signs, sign supports, pavement markings, temporary precast concrete barrier curbs and barricades, variable message signs, and all appurtenances in use on the project.
- Conduct safety meetings with the traffic control devices and pavement markings installation crews, including local and state police, prior to implementing any maintenance and protection of traffic work, including detours, on the project and a minimum of monthly thereafter, or more frequently if required due to staffing changes or installation and removal problems.
- Conduct monthly Traffic Safety "tailgate" sessions with all workers on the project.
- Determine and coordinate the use of/need for "Trafficperson" anywhere on the project. All submittals by the Contractor including "Worksite Traffic Supervisor" activity reports, "Daily Worksite Traffic Safety Log", "Traffic Control Look-Ahead Reports/Schedules" and signing installation/removal plans shall include details of when and where "Trafficperson" are required and used. The use of and payment for "Trafficperson" shall conform to the provision for that item.

- Complete the requirements in “Article 1.05.07 – Coordination of Work by Other Parties”, including coordination of the Contractor’s construction operations and any other activity, requiring traffic control signing patterns for temporary lane and/or shoulder closures, temporary traffic shifts and temporary detours, with adjacent and other Fairfield County Area projects, utility construction, and vehicular and/or pedestrian traffic, public and/or private events, festivals, road races, etc. or other organization on any roadway on the project, as required.
- Mandatory attendance by the “Worksite Traffic Supervisor(s)” and the “MPT Coordinator(s)” at coordination meetings with the Department, adjacent projects and other parties as indicated herein and as deemed necessary.
- Mandatory attendance by the “Worksite Traffic Supervisor(s)”, the “MPT Coordinator(s)”, and the “MPT Supervisor” at Work Zone Safety Meetings, described under Item No. 0971001A, “Maintenance and Protection of Traffic”.
- Timely submission of all submittals detailed under the “Submittals” section of this item. Submittals requiring acceptance by the Engineer must be submitted and accepted prior to the related work being performed.

Submittals

Traffic Shift Sequencing and Operations Plans / Traffic Control Work Plans

Prior to implementing Maintenance and Protection of Traffic (CW MPT) Phases on the project, the Contractor shall develop and submit to the Engineer for review and acceptance, complete “Traffic Shift Sequencing and Operations Plans / Traffic Control Work Plans” specific to each location required to complete the MPT Traffic Shift including any sub-phases, if required, as outlined in the Special Provision “Section 1.08 – Prosecution and Progress”. The “Traffic Shift Sequencing and Operations Plans” shall include a listing of all activities including schedule, which Contract will complete each activity and all required temporary traffic control signing patterns for temporary lane and/or shoulder closures, temporary traffic shifts and temporary detours on any roadway required to complete the Traffic Shift including any sub-phases. The “Traffic Shift Sequencing and Operations Plans” shall be prepared and implemented in accordance with the plans and special provisions including but not limited to the Special Provisions “Maintenance & Protection of Traffic” and “Section 1.08 – Prosecution and Progress”, the Maintenance and Protection of Traffic Plans, Department Standards, and MUTCD requirements. Any recommended revisions required to meet the actual site/field conditions, shall be

submitted to the Engineer prior to implementing the traffic control signing pattern. Acceptance of any revisions is required prior to implementation.

Work Plans

Prior to related work being performed, the Contractor shall develop and submit to the Engineer for review and acceptance, complete “Work Plans” for each portion of the project where the Contractor’s operations require coordination of the work with adjacent and other Fairfield County Area projects, including Maintenance operations, , utility construction, vehicular and/or pedestrian traffic, public and/or private events, festivals, road races, etc. or other organization on any roadway on the project. Each “Work Plan” shall include at a minimum the following information:

- A complete statement of the scope-of-work and the manner in which the Contractor’s operations will be coordinated with the operations of adjacent and other Fairfield County Area projects, utility construction, vehicular and/or pedestrian traffic on any roadway on the project, and any other operation which may require coordination with, to minimize impact to and to ensure the successful completion of the work.
- A complete description of the Contractor’s sequencing and operations to be performed and integrated with the operations of the corresponding “Traffic Shift Sequencing and Operations Plans / Traffic Control Work Plans” with sufficient detail, including sketches, plans and/or references thereto, to adequately depict the work and how the adjacent operations of others described above will be maintained during the Contractor’s operations. Each “Work Plan” shall be titled and sequentially numbered.
- The traffic control and safety measures required to be in place prior to the start of and during the work. A 24-hour emergency contact list.
- A detailed schedule of the Contractor’s operations with the approximate duration of each portion of the work.

Traffic Control Look-Ahead Reports/Schedules

On every Wednesday prior to the close of business, the Contractor shall submit to the Engineer a two-week “Traffic Control Look-Ahead Report/Schedule” that detail the Contractor’s proposed use of traffic control signing patterns for temporary lane and/or shoulder closures, temporary traffic shifts and temporary detours and the use of “Trafficperson” required to complete construction operations are in place on any roadway on the project. The “Traffic Control Look-Ahead Report” included in this item shall be used by the Contractor. The actual traffic shifts etc. shall be coordinated with adjacent and Fairfield County Area projects and activities such that conflicts and impacts with operations are minimized, prior to the submission of the “Traffic Control Look-Ahead Reports / Schedules”.

Worksite Traffic Safety Log

Prior to the installation of any temporary construction signing pattern on the project, a submittal shall be made to the Engineer for acceptance of the proposed “Daily Worksite Traffic Safety Log” form to be used throughout the duration of the project. Once accepted, the “Daily Worksite Traffic Safety Log” shall be maintained for all worksite activities on the project and shall be submitted weekly to the Engineer by noon on every Monday of the following week. The “Daily Worksite Traffic Safety Log” form shall include at a minimum the following information:

- Date, weather conditions, and temperature
- Location and type of signing pattern(s) installed, time of installation and time of removal
- The name of the “Worksite Traffic Supervisor(s)” on site and all activities performed by the “Worksite Traffic Supervisor(s) including but not limited to the time of periodic reviews of the signing pattern(s), report of status/condition of all traffic control devices including: construction signing patterns, signs, sign supports, pavement markings, temporary precast concrete barrier curbs and barricades, variable message signs, and all appurtenances in use on the project, report of deficiencies noted and corrective action taken, report of operational problems and adjustments made, and report of any accidents within the Contract limits.
- The name of the “MPT Supervisor(s) overseeing the “Worksite Traffic Supervisor(s), all activities performed by the “MPT Supervisor(s) related to this item and the signature of the “MPT Supervisor(s) representing review of the “Daily Worksite Traffic Safety Log”.
- Reports of safety meetings and Traffic Safety “tailgate” sessions shall be attached to the “Daily Worksite Traffic Safety Log” on the day the safety meeting was held. The reports shall include a record of attendees and topic(s) discussed.

All logs, reports, submittals, etc. (including all attachments) detailed herein shall be transmitted by the Contractor in electronic format.

Method of Measurement:

Within forty (40) calendar days of the award of the Contract, the Contractor shall submit to the Engineer for approval a cost breakdown of his lump sum bid price. The submission must include substantiation showing that the cost breakdown submitted are reasonable based on the Contractor's lump sum bid. The cost breakdown shall be in accordance with the following payment schedule:

1. The development costs to prepare the “Daily Worksite Traffic Safety Log” form to be used throughout the duration of the project and the assignment and acceptance of certified personnel to act as the “Worksite Traffic Supervisor(s)”, the “MPT Coordinator(s) and the “MPT Supervisor” for the project shall not exceed 5% of the total cost of the item.
2. The cost to complete all work required under this item including providing services of the “Worksite Traffic Supervisor(s)”, “MPT Coordinator(s)”, and “MPT Supervisor(s)”; all, monitoring, inventory, daily log preparation, submittals, reports, schedules, meetings, traffic safety “tailgate” sessions, handling of all traffic appurtenances, and all materials, equipment,

ITEM #0973725A

labor and work incidental of this service; project coordination and managing the work efforts of all personnel and all work activities covered under this item, shall be paid as a per month cost and shall be derived by taking this cost divided by the number of contract months.

Upon approval of the payment schedule by the Engineer, payments for work performed will be made as follows:

1. Upon acceptance of the “Daily Worksite Traffic Safety Log” form to be used throughout the duration of the project and the assignment and acceptance of certified personnel to act as the “Worksite Traffic Supervisor(s)”, the “MPT Coordinator(s)” and the “MPT Supervisor” for the project, the lump sum development cost from the payment schedule shall be certified for payment.
2. Upon receipt of the reports required each month as per this specification, the per month cost for “Worksite Traffic Supervisor” will be certified for payment.

Basis of Payment:

This service shall be paid for at the contract lump sum price for "Worksite Traffic Supervisor" complete, which price shall include all inspections, monitoring, inventory, submittals, sign installation/removal plans, “Traffic Shift Sequencing and Operations Plans / Traffic Control Work Plans”, “Work Plans”, daily logs, reports, schedules, meetings, traffic safety “tailgate” sessions, and handling of all traffic appurtenances, and all materials, equipment, labor and work incidental of this service. The lump sum price will be certified for payment as described in "Method of Measurement" subject to the following conditions:

1. Failure of the Contractor to provide a “Worksite Traffic Supervisor(s)”, “MPT Coordinator(s)”, or “MPT Supervisor”, as required by this specification will result in a five (5) percent reduction to the monthly payment for each work shift that is not covered as required by this specification. A work shift is defined as any eight (8) hour period, or any portion thereof. The total deduction for any calendar month may exceed the monthly payment for the item.
2. Any weekly submittal of Traffic Control Look-Ahead Reports/Schedules and/or Daily Worksite Traffic Safety Log report that is submitted late will result in a two percent (2%) per day per report reduction of the entire “Worksite Traffic Supervisor” monthly payment for each day the report has been submitted late, up to a maximum of ten percent (10%) of the monthly payment per report.
3. Failure by the Contractor to submit a “Traffic Shift Sequencing and Operations Plans / Traffic Control Work Plan”, or “Work Plan”, and prior to the work described in the plan(s) and as described in this Specification, will result in a twenty percent (20%) per report

reduction of the entire "Worksite Traffic Supervisor" monthly payment for each report not submitted prior to the work being performed.

4. Should the Contractor fail to continuously comply with this specification, including the submission of all reports, as required by this specification, the Engineer may withhold all contract payments until such time as all requirements are satisfied. Contract payments may be withheld when either of the following conditions apply:
 - a. If the deductions under Item nos. 1, 2 and/or 3 exceed the monthly payment for the item in any calendar month
 - b. If the deductions under Item nos. 1,2 and/or 3 exceed ten percent (10%) of the monthly payment for the item for any three (3) months in any twelve (12) month period
5. Failure by the Contractor to comply with the requirements of this specification shall result in the replacement of the "Worksite Traffic Supervisor(s)", "MPT Coordinator(s)", and/or "MPT Supervisor", at the Engineer's request. Additionally, the Contractor may be found in violation of Article 1.02.02 of the Standard Specifications "for having failed to prosecute work continuously, diligently and cooperatively in an orderly sequence".
6. The cost to provide services of the "MPT Supervisor" and "MPT Coordinator(s)", including costs for all project coordination and managing the work efforts of all the "Worksite Traffic Supervisor(s)" and all work activities covered under this item will not be paid for directly, but will be included under the item "Worksite Traffic Supervisor".
7. Only one (1) monthly payment will be made for each calendar month regardless of the number of certified personnel required due to multiple shift operations.
8. In the event the project extends beyond the original completion date by more than thirty (30) calendar days, and a time extension is granted to the Contractor, the Department may require the continued utilization of the "Worksite Traffic Supervisor(s)" which shall be paid at the per month cost for the services of the "Worksite Traffic Supervisor".

<u>Pay Item</u>	<u>Pay Unit</u>
Worksite Traffic Supervisor	L.S.

**ITEM #1204121A - INSTALL STATE FURNISHED SIGN FACE SHEET
ALUMINUM (LARGE SIGNS)**

Article 12.04.01 - Description: This item shall consist of installing sign face sheet aluminum signs of the type specified, furnished by the State at locations indicated on the plans or as directed by the Engineer and in conformance with the plans and these specifications.

<u>Sign No.</u>	<u>Legend</u>
015N_158_20.36_A	EXIT 41 – 33 – Westport – Wilton – ¼ MILE
015N_158_20.65_A	EXIT 41 – 33 ↗ – Westport – Wilton
015N_158_21.08_A	EXIT 42 – 57 – Westport – Weston – ½ MILE (service signs - 1)
015N_158_21.50_A	EXIT 42 – 57 ↗ – Westport – Weston
015S_158_22.75_A	EXIT 42 – 57 – Westport – Weston – 1MILE (service signs - 1)
015S_158_22.05_A	EXIT 42 – 57 – Westport – Weston – ½ MILE
015S_158_21.69_A	EXIT 42 – 57 ↗ – Westport – Weston
015S_158_21.27_A	EXIT 41 – 33 – Westport – Wilton – ½ MILE (service signs - 3)
015S_158_20.70_A	EXIT 41 – 33 ↗ – Westport – Wilton
015N_158_R187_EX42_A	↑ 15 – SOUTH / 15 – NORTH – New Haven – →
015N_158_R187_EX42_B	NO COMMERCIAL VEHICLES
015N_158_R187_EX42_C	15 – NORTH – New Haven – ←
015N_158_R187_EX42_D	NO COMMERCIAL VEHICLES
015N_158_R198_EX41_A	↑ 15 – SOUTH / 15 – NORTH – New Haven – →
015N_158_R198_EX41_B	NO COMMERCIAL VEHICLES
015N_158_R198_EX41_C	15 – NORTH – New Haven – ←
015N_158_R198_EX41_D	NO COMMERCIAL VEHICLES
015N_158_R198_EX41_E	15 – NORTH – New Haven – ←
015N_158_R198_EX41_F	NO COMMERCIAL VEHICLES
015S_158_R185_EX42_A	↑ 15 – NORTH / 15 – SOUTH – N. Y. City – →
015S_158_R185_EX42_B	NO COMMERCIAL VEHICLES
015S_158_R185_EX42_C	15 – SOUTH – N. Y. City – ←
015S_158_R185_EX42_D	NO COMMERCIAL VEHICLES
015S_158_R195_EX41_A	15 – SOUTH – N. Y. City – ←
015S_158_R195_EX41_B	NO COMMERCIAL VEHICLES
015S_158_R195_EX41_C	↑ 15 – NORTH / 15 – SOUTH – N. Y. City – →
015S_158_R195_EX41_D	NO COMMERCIAL VEHICLES

12.04.02 - Material: All signs shall be furnished by the State. The following sign details are for reference only.

12.04.03 – Construction Methods: The Contractor shall arrange a schedule to pick up the sheet aluminum signs from the Department of Transportation Sign Shop located at 1107 Cromwell Avenue (Route 3) in Rocky Hill. Contact Rene Rodriguez Jr. at (860) 258-4675 at least 45 days in advance to schedule a pick up of the signs. In addition, the Contractor shall contact the Sign Shop one work day prior to the scheduled date to confirm the location and time of pick-up. A storage fee of ten dollars per day per sign shall be charged to the Contractor for any signs which are not picked up on the scheduled date.

The Contractor shall sign a receipt listing all signs furnished by the State. All signs provided by the State shall be transported and stored, if necessary, with care. The Contractor shall transport and install the signs in a manner that will not cause twisting, bending, or deforming the sign and that will not cause scratching of the sign face. It shall be the Contractor’s responsibility from the time of pick-up until the signs are installed and accepted to repair or replace any signs damaged during delivery or during installation at no cost to the State.

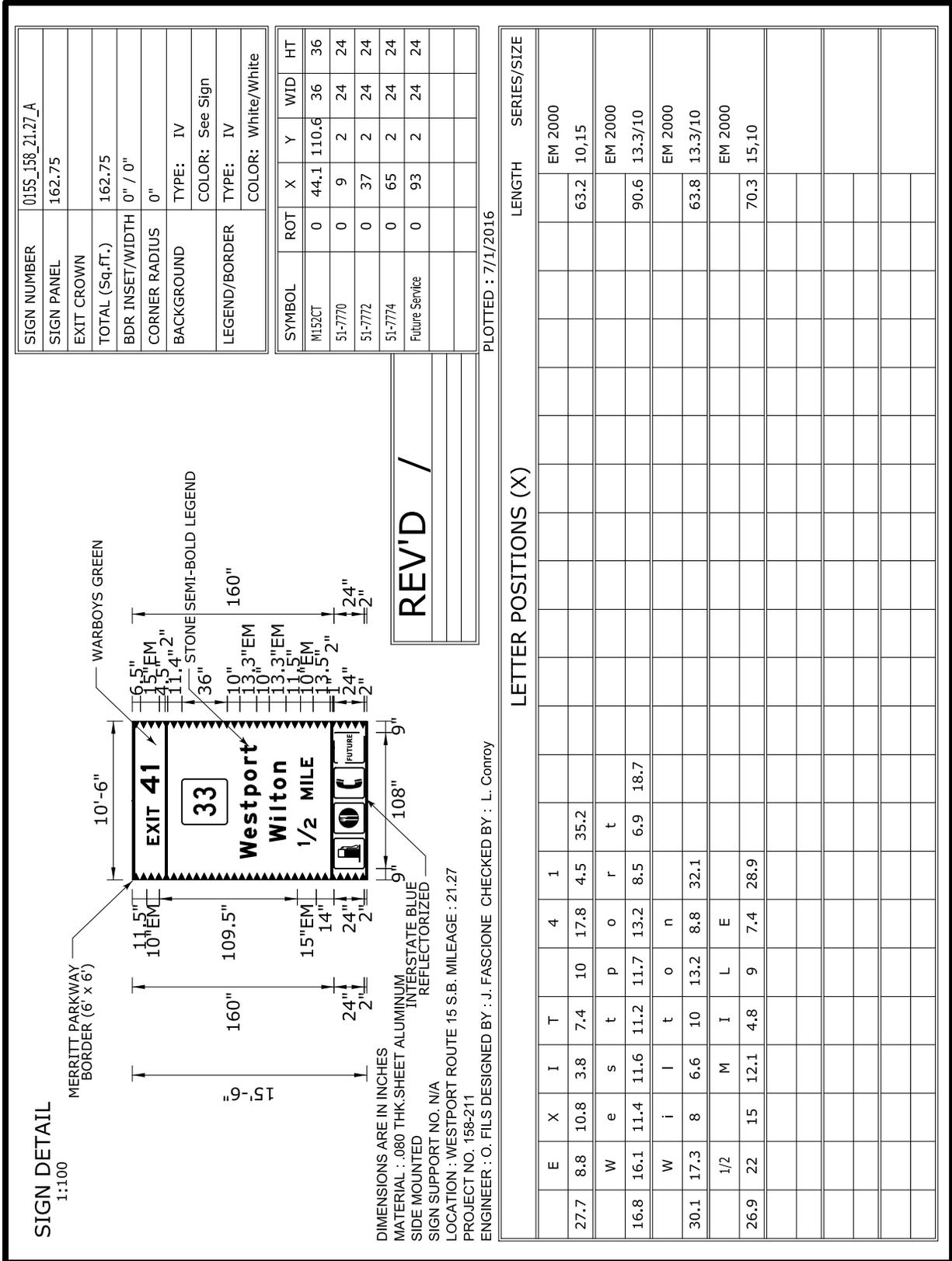
The signs shall be mounted on the type of support designated on the plans after the supports have been satisfactorily installed at the proper location. The large sheet aluminum signs shall be fastened to the blank extruded aluminum sign panels using aluminum rivets. The aluminum rivets shall be of the pull through type of adequate size and number to securely and permanently fasten the sign panel to the extruded aluminum to the satisfaction of the Engineer.

All sign foundations shall be field staked and the locations approved by an engineer from the Division of Traffic Engineering a minimum of seven days prior to installation.

12.04.04 – Method of Measurement: This work will be measured for payment by the number of square feet of sign face-sheet aluminum of the type specified, picked up, installed and accepted.

12.04.05 – Basis of Payment: This work will be paid for at the contract unit price per square feet for “Install State Furnished Sign Face Sheet Aluminum (Large Signs)” of the type specified complete in place which price shall include transportation from the pickup source to the location, storage, mounting hardware, including post support clips, large channel butting plates, aluminum rivets, and all materials, equipment, labor and work incidental thereto. Excepted therefrom will be the price for sign supports which will be paid for under Item No. 0603475A Structural Steel Sign Support (Painted), the foundations which will be paid for under Item No. 1203109 Side Mounted Sign Foundation, and blank extruded aluminum sign panels which will be paid under Item No. 1207034A Sign Face - Extruded Aluminum (Type IV Retroreflective Sheeting).

Pay Item	Pay Unit
Install State Furnished Sign Face Sheet Aluminum (Large Signs)	sq. ft.



SIGN NUMBER	0155_158_21.27_A
SIGN PANEL	162.75
EXIT CROWN	
TOTAL (Sq.Ft.)	162.75
BDR INSET/WIDTH	0" / 0"
CORNER RADIUS	0"
BACKGROUND	TYPE: IV
LEGEND/BORDER	COLOR: See Sign
	TYPE: IV
	COLOR: White/White

SYMBOL	ROT	X	Y	WID	HT
M152CT	0	44.1	110.6	36	36
51-7770	0	9	2	24	24
51-7772	0	37	2	24	24
51-7774	0	65	2	24	24
Future Service	0	93	2	24	24

PLOTTED : 7/1/2016

LETTER POSITIONS (X)					LENGTH	SERIES/SIZE					
E	X	I	T			EM 2000					
27.7	8.8	10.8	3.8	7.4	10	17.8	4.5	35.2	63.2	10,15	
W	e	s	t	p	o	r	t			EM 2000	
16.8	16.1	11.4	11.6	11.2	11.7	13.2	8.5	6.9	18.7	13.3/10	
W	i	l	t	o	n					EM 2000	
30.1	17.3	8	6.6	10	13.2	8.8	32.1			13.3/10	
1/2		M	I	L	E					EM 2000	
26.9	22	15	12.1	4.8	9	7.4	28.9			70.3	15,10

