SUMMARY LIST OF GENERAL SPECIAL PROVISIONS

The following list is a summary of all approved General Special Provisions for the *2018 Standard Specifications for Construction*. This list is only intended to serve as a general guide to identify which subsections have been modified. The full text must be referenced to determine the details of the change.

The list is organized by subsection. Not all General Special Provisions are listed individually – modifications which were made to adjacent subsections for the same general reason may be combined within this list. Entries in bold text indicate the most recent changes, which were approved for projects advertising on or after the date given in the header of this document.

Subsections Changed	Broad Description of Changes	Date of GSP
Subsection 101.02	Replaced "Columbus Day" with "Indigenous Peoples' Day" to reflect change in state law.	7-23-2019
Subsection 101.02	**Deleted all references to Supplemental Specifications.**	**10-22-2019**
Subsection 103.03	Legal reference to sales tax regulations corrected.	8-8-2018
Subsection 105.05(a)	**Deleted all references to Supplemental Specifications and modified the Contract Document Precedence to reflect the elimination of Supplemental Specifications.**	**10-22-2019**
Subsection 105.05(d)	**Deleted all references to Supplemental Specifications.**	**10-22-2019**
Subsection 105.14	Corrected double numbering by re-lettering list parts.	8-8-2018
Subsection 105.16	Corrected legal reference.	8-8-2018
Subsection 106.09(c)	**Revised the stockpiling requirements for raw materials.**	**10-22-2019**
Subsections 203.03 and 204.03	Added a requirement to submit construction drawings when required by OSHA or VOSHA.	7-23-2019
Subsection 210.03	Modified requirements for length of time milled surface can remain unpaved	7-23-2019
Subsection 406.03B	Added requirements for the contractor to provide Hamburg Wheel-Track and FIT testing data in mix designs.	7-23-2019
Subsection 406.03C (Table 406.03I)	Corrected an ASTM reference and slightly modified Note 4.	7-23-2019
Subsections 406.03C(e) and 406.19(c)	Changed names of subsections to better match their contents and the names of other subsections.	8-8-2018
Subsection 406.14	**Added a requirement to use a self-propelled pneumatic tired roller for the levelling course of pavement.**	**10-22-2019**
Subsection 407.03	Deleted and replaced several paragraphs to correct equations and the table.	7-23-2019
Section 418	**Created a new section for Asphaltic Approach Material.**	**10-22-2019**
Subsection 501.03	**Deleted and replaced the entire subsection to update testing and mix design requirements.**	**10-22-2019**

Subsections Changed	Broad Description of Changes	Date of GSP
Subsection 501.04	**Deleted and replaced paragraphs 1 through 3 to update the batching requirements.**	**10-22-2019**
Subsection 501.05(a)	**Deleted and replaced parts (2) and (3) to update the mixing and delivery requirements.**	**10-22-2019**
Subsection 506.02	Updated the name of the subsection for one of the materials and added a new material subsection to the list.	7-23-2019
Subsection 506.03	Deleted and replaced multiple paragraphs to clarify requirements for fabrication drawings, the use of subcontractors for fabrication, and the level of plant certification required.	7-23-2019
Subsection 506.03(c)(1)	Deleted and replaced the subsection to provide additional details about inspectors.	7-23-2019
Subsections 506.03(d)(3) and 506.03(e)	Minor wording changes.	7-23-2019
Subsection 506.04(c)	Deleted and replaced subsection to modify welding procedures.	7-23-2019
Subsection 506.05(b)	Deleted a sentence.	7-23-2019
Subsection 506.06(b)	Deleted and replaced subsection to modify inspector requirements.	7-23-2019
Subsection 506.10(d)	Minor wording changes.	7-23-2019
Subsection 506.10(e)(1)	Deleted two paragraphs.	7-23-2019
Subsection 506.12(d)	Minor wording changes.	7-23-2019
Subsection 506.14	Deleted and replaced subsection to clarify surface preparation requirements.	7-23-2019
Subsection 506.18(b)	Deleted and replaced parts (2) and (3) to clarify alignment, drilling and reaming requirements.	7-23-2019
Subsections 506.19(a) and 506.19(b)	Minor wording changes.	7-23-2019
Subsection 506.19(c)	Added a sentence stating that standard bolts are to be Grade A 325.	8-8-2018
Subsection 506.19	Relabeled existing part (d) as part (e) and broke the existing part (c) in half, creating a new part (d) in the process. Done to correct duplicate list numbering in part (c). Also corrected internal cross references.	8-8-2018
Subsections 506.19(d)(1) and 506.19(e)	Minor wording changes.	7-23-2019
Subsection 506.23	Deleted and replaced entire subsection to add additional coating requirements.	7-23-2019
Subsection 506.25	Deleted and replaced entire subsection.	7-23-2019
Subsections 510.12(b) and 540.11(b)	Corrected internal cross references.	8-8-2018
Subsection 516.02	**Updated materials listing to reflect name change of Subsection 707.15**	**10-22-2019**

Subsections Changed	Broad Description of Changes	Date of GSP
Subsection 519.02	**Deleted and replaced subsection to reflect changes made in Subsection 726.11.**	**10-22-2019**
Subsection 524.02	**Updated materials listing to reflect name change of Subsection 707.15**	**10-22-2019**
Subsection 540.02	**Updated material listing to reflect changes made in Subsection 726.11.**	**10-22-2019**
Subsection 540.10	**Updated internal cross reference to reflect changes made in Subsection 726.11.**	**10-22-2019**
Subsection 540.12	Corrected internal cross reference.	8-8-2018
Subsection 540.14(b)	**Replaced the word "prestressed" with the word "precast".**	**10-22-2019**
Subsection 543.04	Deleted and replaced sentence to correct submittal requirements.	7-23-2019
Subsection 605.02	**Updated materials listing to reflect name change of Subsection 707.15**	**10-22-2019**
Subsection 605.02	Added a new material subsection to the list and deleted internal cross reference. Changes made to conform to new Section 720.	8-8-2018
Subsection 625.02	Deleted incorrect material reference.	1-18-2019
Subsection 630.01	Minor wording changes.	7-23-2019
Subsection 630.02(b)	Deleted and replaced subsection to modify flagger apparel requirements.	7-23-2019
Subsection 630.04(a)	Modified flagger training requirements.	1-18-2019
Subsection 631.08	Modified requirements for grout molds.	1-18-2019
Subsection 631.09	**Deleted a sentence that dictated an Agency process.**	**10-22-2019**
Subsection 641.02	Deleted and replaced several paragraphs in order to add new subparts and clarify the difference between the traffic control items.	7-23-2019
Subsection 641.03	Added paragraph requiring security system for PCMS.	1-18-2019
Subsection 641.07	Deleted and replaced entire subsection to clarify basis of payment.	7-23-2019
Subsection 646.02	Deleted and replaced multiple entries in the materials list.	7-23-2019
Subsection 646.04	Minor wording changes.	7-23-2019
Subsection 646.07	Deleted and replaced parts (a) and (b) to redefine marking tape types.	7-23-2019
Subsection 646.07	Deleted parts (c) and (d).	7-23-2019
Subsection 646.07	Relabeled parts (e) and (f) as the new parts (c) and (d).	7-23-2019
Subsection 646.07	Inserted a new part (e) for preformed thermoplastic and relabeled part (g) as part (f).	1-18-2019
Subsections 646.07(c)(1) and 646.07(f)(1)	Minor wording changes.	1-18-2019
Subsection 646.08	Changed the name of part (a) to reflect redefined marking tape types.	7-23-2019
Subsection 646.09 (Table 646.09A)	Replaced the column headers of the table.	1-18-2019

Subsections Changed	Broad Description of Changes	Date of GSP
Subsections 646.13 and 646.14	Deleted all references to "Raised Pavement Markers, Type II", including the pay item.	7-23-2019
Subsection 649.02	Deleted and replaced existing subsection so it would conform with the new Section 720.	8-8-2018
Subsection 653.02	Added new material subsections to the list and deleted internal cross reference. Changes made to conform to new Section 720.	8-8-2018
Subsection 653.08(a)(1), 653.09(a), 653.09(b)(1) and 653.09(b)(3)	Corrected references to various geotextile requirements to conform to new Section 720.	8-8-2018
Subsection 675.02	Deleted internal cross reference.	1-18-2019
Subsection 675.07(b)(2)	Deleted and replaced subsection to modify the requirements.	7-23-2019
Subsection 675.07(d)	Added two new sentences to add additional requirements for fasteners.	7-23-2019
Subsection 677.03	Added a sentence removing the requirement for field verification of DTI's.	8-8-2018
Subsection 679.02	Deleted one materials section listing and added two new ones to match changes in Subsection 753.04.	1-18-2019
Subsection 679.05	Deleted existing first sentence and added two new paragraphs	1-18-2019
Subsection 679.09	Added a sentence removing the requirement for field verification of DTI's.	8-8-2018
Subsection 680.02	Deleted internal cross reference.	1-18-2019
Subsection 702.06 (Table 702.06A)	Deleted and replaced table to correct some temperatures and add a new row.	7-23-2019
Subsection 704.10(a)	Corrected AASHTO references.	7-23-2019
Subsection 707.14 (Table 707.14A)	Corrected AASHTO references.	1-18-2019
Subsection 707.15	**Deleted and replaced entire subsection to update requirements.**	**10-22-2019**
Subsection 707.17	**Added a new subsection to provide material requirements for the new Section 418.**	**10-22-2019**
Subsection 708.03	Deleted and replaced entire subsection to provide new requirements.	7-23-2019
Subsection 708.06	Deleted and reserved entire subsection.	1-18-2019
Subsection 708.08 (Table 708.08C)	Added two rows to the table	7-23-2019
Subsection 708.11	Deleted and reserved entire subsection.	7-23-2019
Subsection 708.12	Deleted and replaced entire subsection to provide new requirements.	7-23-2019
Subsection 711.02	Corrected internal cross reference.	1-18-2019
Subsections 713.04 and 713.05	Corrected AASHTO references.	1-18-2019
Subsection 714.05	Deleted and replaced the first sentence to provide new requirements.	7-23-2019

Subsections Changed	Broad Description of Changes	Date of GSP
Subsection 714.06	Deleted and replaced the first sentence to provide new requirements.	7-23-2019
Section 720	Deleted and replaced entire section in order to align it with current AASHTO specifications.	8-8-2018
Subsection 720.03 (Table 720.03A)	**Updated the MARV value for Apparent Opening Size (mm).**	**10-22-2019**
Subsection 720.06 (Table 720.06A)	**Updated the MARV value for Apparent Opening Size (mm).**	**10-22-2019**
Subsections 725.01(d) and 725.02(a)	Deleted and replaced both parts to update requirements.	1-18-2019
Subsection 726.09	Deleted and replaced entire subsection to clarify the requirements.	7-23-2019
Subsection 726.11	**Deleted and replaced entire subsection to update the requirements for waterproofing membrane systems.**	**10-22-2019**
Subsection 753.04	Created separate requirements for steel and aluminum bracket arms.	1-18-2019
Section 754	Created a new section for pavement marking materials.	7-23-2019
Alphabetical Index of Pay Items	Corrected the name of item 406.38.	7-23-2019
Alphabetical Index of Pay Items	**Added item 418.10**	**10-22-2019**
Alphabetical Index of Pay Items	Deleted item 646.75.	7-23-2019

GENERAL SPECIAL PROVISIONS FOR ALL PROJECTS

2018 STANDARD SPECIFICATIONS FOR CONSTRUCTION

SECTION 101 – DEFINITIONS AND TERMS

101.02 DEFINITIONS, the definition for "Holidays" is hereby modified by deleting the phrase "Columbus Day" from the first column and replacing it with the phrase "Indigenous Peoples' Day".

101.02 DEFINITIONS, is hereby modified by deleting the phrase "Supplemental Specifications," from the definitions for "Contract", "Project Special Provisions", and "Specifications".

101.02 DEFINITIONS, is hereby modified by deleting the entry for, and definition of, "Supplemental Specifications".

SECTION 103 – TAXES AND INSURANCE

103.03 STATE SALES TAX is hereby modified by deleting the phrase "(see *Vermont Sales and Use Tax Regulations, No. 226-2* and *226-7* and *32 V.S.A. § 9743(4)*)" and the phrase "(see *32 V.S.A. § 9741(44)*)." from the first paragraph.

103.03 STATE SALES TAX is hereby further modified by adding the following reference to the end of the first paragraph:

(see *32 V.S.A. § 9743(4)*, *32 V.S.A. § 9741(30)*, *32 V.S.A. § 9741(44)*, and the *Vermont Sales and Use Tax Regulations*, *Reg. § 1.9741(34)-5* and *Reg. § 1.9743*).

SECTION 105 – CONTROL OF THE WORK

105.05 COORDINATION OF CONTRACT DOCUMENTS, part (a), is hereby modified by deleting the phrase "Supplemental Specifications," from the first sentence.

105.05 COORDINATION OF CONTRACT DOCUMENTS, part (a)(1), is hereby modified by deleting subpart g. in its entirety, relabeling subpart h. as subpart g., and relabeling subpart i. as subpart h.

105.05 COORDINATION OF CONTRACT DOCUMENTS, part (d), is hereby modified by deleting the phrase "Supplemental Specifications," from the last sentence.

105.14 SUNDAY, NIGHT, AND HOLIDAY WORK is hereby modified by relabeling part (c), "Application.", as "(d) Application." and part (d), "Other Provisions Not Affected.", as "(e) Other Provisions Not Affected."

105.16 LOAD RESTRICTIONS, part (c), Penalty and Reduction for Overweight Operation., is hereby modified by changing the phrase "*23 V.S.A. § 1391(a)*" to read "*23 V.S.A. § 1391a*".

SECTION 106 – CONTROL OF MATERIALS

106.09 STOCKPILING, part (c), is hereby modified by being deleted in its entirety and replaced with the following:

(c) Raw Materials. In addition to the criteria set out above for other materials, raw material stockpiles shall be approved by the Construction Engineer and meet the following additional criteria:

(1) The various components of the finished product shall include all of the appropriate certifications, passing samples, passing tests, and any other documentation that may be required to certify that the materials are acceptable.

(2) For stockpiles of structural steel, invoices or quotes from the fabricator shall include supporting documentation such as mill invoices or quotes that show actual dimensions, quantities, and costs to the fabricator for the raw materials. The intent of this raw material payment is to reimburse the actual amount it cost the fabricator to purchase the raw materials for the specific Contract item. There will be no allowance for mark up of any type by the Contractor or fabricator. Stockpile payments will be limited to one payment per 6 months, per Contract item. There will be no raw material stockpile payment allowed for materials that do not meet the dimensions provided on the mill invoices.

(3) Any other criteria the Engineer deems necessary to allow for payment.

SECTION 203 – EXCAVATION AND EMBANKMENTS

203.03 GENERAL CONSTRUCTION REQUIREMENTS is hereby modified by adding the following as the last sentence of the ninth paragraph:

Construction Drawings shall be submitted in accordance with Section 105 whenever OSHA or VOSHA regulations require a design by a Professional Engineer.

SECTION 204 – EXCAVATION FOR STRUCTURES

204.03 GENERAL CONSTRUCTION REQUIREMENTS is hereby modified by adding the following as the last sentence of the third paragraph:

Construction Drawings shall be submitted in accordance with Section 105 whenever OSHA or VOSHA regulations require a design by a Professional Engineer.

SECTION 210 – COLD PLANING

210.03 GENERAL CONSTRUCTION REQUIREMENTS, part (b) is hereby modified by being deleted in its entirety and replaced with the following:

(b) The Contractor shall repave any coarse-milled areas within 14 Calendar Days and any fine-milled areas within 28 Calendar Days of milling, or when directed by the Engineer. Should the area remain unpaved for a period longer than specified herein, without the approval of the Engineer, no payment whatsoever will be made for the milled areas left exposed in excess of the 14 or 28 Calendar Day periods. If the Contractor lays down temporary pavement to avoid the above non-payment for milling, temporary pavement and subsequent milling shall be at the Contractor's expense.

SECTION 406 – BITUMINOUS CONCRETE PAVEMENT

406.03B COMPOSITION OF MIXTURE – SUPERPAVE, part (c), is hereby modified by adding ", unless otherwise noted in this section." to the end of the sentence which begins with "For Superpave bituminous concrete pavement mixes, *AASHTO R 35*…".

406.03B COMPOSITION OF MIXTURE – SUPERPAVE, part (c), is hereby further modified by deleting the word "four" from the sentence which currently reads "The four principal parts of the Superpave Mix Design Method are:" and replacing it with the word "five".

406.03B COMPOSITION OF MIXTURE – SUPERPAVE, part (c), is hereby further modified by deleting subpart (4) in its entirety and replacing it with the following:

(4) Evaluate moisture sensitivity and rutting susceptibility using *AASHTO T 324*. Test specimens for Hamburg Wheel-Track (HWT) testing shall be 150 mm (6.0 inches) in diameter with a 60 ± 1 mm (2.36 ± 0.04 inch) thickness and shall be short term conditioned in accordance with Section 7.2 of *AASHTO R 30*. HWT specimens shall be tested at 45 ± 1° C (113 ± 1.8° F), with the machine pre-set to end the test once a maximum rut depth of 12.5 mm (0.50 inches) is reached. If the difference in the rut depth between the two pairs of specimens is 6 mm (0.24 inches) or more, and/or only one pair of specimens has a final rut depth of 12.5 mm (0.50 inches), the test results will be deemed invalid and not acceptable for mix design qualification. Slab specimens shall not be used.

(5) Determine cracking susceptibility using *AASHTO TP 124*. Test specimens for the FIT shall be fabricated in a Superpave Gyratory Compactor and short term conditioned in accordance with Section 7.2 of *AASHTO R 30*. Specimens that are fabricated to a height of 50 mm (2.0 inches), in lieu of fabricating 160 mm (6.30 inch) or 115 mm (4.50 inch) specimens as part of the test specimen preparation procedures outlined in *AASHTO TP 124*, will be allowed.

406.03C REQUIREMENTS FOR BOTH MARSHALL AND SUPERPAVE BITUMINOUS MIXTURES is hereby modified by changing the name of part (e) from "Pay Factor Determination." to "Air Voids Pay Factor (PF_{AV}) Determination."

406.03C REQUIREMENTS FOR BOTH MARSHALL AND SUPERPAVE BITUMINOUS MIXTURES, Table 406.03I, is hereby modified by deleting the phrase "*ASTM D 5821*" and replacing it with the phrase "*ASTM T 335*" in the third column of the fifth row.

406.03C REQUIREMENTS FOR BOTH MARSHALL AND SUPERPAVE BITUMINOUS MIXTURES, Table 406.03I, Note 4, is hereby modified by deleting the word "more" and replacing it with the word "less".

406.14 COMPACTION is hereby modified by adding "Leveling courses shall be compacted using a self-propelled pneumatic tired roller for intermediate rolling, unless otherwise permitted in writing by the Engineer." as the second sentence.

406.19 METHOD OF MEASUREMENT is hereby modified by changing the name of part (c) from "Longitudinal Joint Pay Factor." to "Longitudinal Joint Pay Adjustment."

SECTION 407 – BONDED WEARING COURSE

407.03 COMPOSITION OF MIXTURE is hereby modified by deleting the portion of the Subsection beginning with "PG Binder percentage shall be based on a minimum film thickness of 10.0 microns..." and ending with Table 407.03B, and replacing the deleted text and table with the following:

The asphalt cement content shall be based on a minimum asphalt film thickness of 0.394 mils (10.0 microns). The minimum asphalt cement content shall be calculated according to the following formulas and the factors in Table 407.03B.

For English units: $W = 0.0052 \times A_s \times T \times G_b$

For metric units: $W = 0.001 \times A_s \times T \times G_b$

and, for consistent units: $P_{bmin} = \frac{W}{1+W} \times 100$

where:

W = Intermediate variable

A_s = Total aggregate surface area* (square feet per pound or square meters per kilogram of aggregate)

T = Minimum asphalt film thickness (mils or microns)

G_b = Specific gravity of asphalt cement

P_{bmin} = Minimum asphalt cement content (percent by mass)

* The total aggregate surface area is calculated by multiplying the percent passing each sieve (as a decimal, i.e. 30% = 0.30) in the JMF by the corresponding factor in Table 407.03B and summing the resultant values.

TABLE 407.03B – AGGREGATE SURFACE AREA FACTORS

Sieve Designation	Surface Area Factors					
	Type A		Type B		Type C	
	SF/lb	SM/kg	SF/lb	SM/kg	SF/lb	SM/kg
3/4 inch (19.0 mm)	--	--	--	--	2.0	0.41
1/2 inch (12.5 mm)	--	--	2.0	0.41	0	0
3/8 inch (9.50 mm)	2.0	0.41	0	0	0	0
No. 4 (4.75 mm)	2.0	0.41	2.0	0.41	2.0	0.41
No. 8 (2.36 mm)	4.0	0.82	4.0	0.82	4.0	0.82
No. 16 (1.18 mm)	8.00	1.64	8.00	1.64	8.00	1.64
No. 30 (0.600 mm)	14.0	2.87	14.0	2.87	14.0	2.87
No. 50 (0.300 mm)	30.0	6.14	30.0	6.14	30.0	6.14
No. 100 (0.150 mm)	60.00	12.29	60.00	12.29	60.00	12.29
No. 200 (0.075 mm)	160.0	32.77	160.0	32.77	160.0	32.77

SECTION 418 – ASPHALTIC APPROACH MATERIAL

SECTION 418 – ASPHALTIC APPROACH MATERIAL is hereby made a new section of the specifications as follows:

SECTION 418 – ASPHALTIC APPROACH MATERIAL

418.01 DESCRIPTION. This work shall consist of furnishing and installing asphaltic approach material at the transition between bituminous concrete pavement and Portland cement concrete, steel or other materials.

418.02 MATERIALS. Materials shall meet the requirements of the following Subsections:

Asphalt Plug Joint Binder 707.17

418.03 INSTALLATION. Asphaltic approach material shall be installed at the locations(s) and to the depth and configuration shown in the Plans and as directed by the Engineer.

418.04 METHOD OF MEASUREMENT. The quantity of Asphaltic Approach Material to be measured for payment will be the number of square feet used in the complete and accepted work.

418.05 BASIS OF PAYMENT. The accepted quantity of Asphaltic Approach Material will be paid for at the Contract unit price per square foot. Payment will be full compensation for detailing, furnishing, handling, transporting, and placing the material specified, including surface preparation, and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Tack, prime, or seal coats of bituminous material required for the installation of asphaltic approach material will not be paid for separately, but will be considered incidental to the Contract unit price for Asphaltic Approach Material.

Removal of any existing asphaltic, bituminous or Portland cement concrete materials to allow for the installation of asphaltic approach material will not be paid for separately, but will be considered incidental to the Contract unit price for Asphaltic Approach Material.

Payment will be made under:

Pay Item	Pay Unit
418.10 Asphaltic Approach Material	Square Foot

SECTION 501 – PERFORMANCE BASED STRUCTURAL CONCRETE

501.03 CLASSIFICATION AND PROPORTIONING is hereby modified by being deleted in its entirety and replaced with the following:

501.03 CLASSIFICATION AND PROPORTIONING. The following classes of concrete, shown in Table 501.03A, are included in these Specifications and shall be used as shown on the plans.

TABLE 501.03A – PERFORMANCE-BASED CONCRETE CLASSES AND PROPERTIES

Class of Concrete [1]	28-Day Compressive Strength (psi) [2]	Target W/CM Ratio [3]	VSI	Slump/Spread Target and Range (in.)	Max. Slump (in.)	Air Content Limits [4]	Free Shrinkage [5]	Max. 56-Day Surface Resistivity [6]
PCD	4,000	TBD	--	TBD ± 1.5 [7]	9	5.5% – 8.5%	0.032%	Low
PCS	3,500	TBD	--	TBD ± 2.5 [7]	9	5.5% – 8.5%	0.042%	Low
SCC	4,000	TBD	≤ 1	TBD [8]	--	6.5% – 8.5%	--	Low

[1] PCD = Performance Concrete, Deck

PCS = Performance Concrete, Substructure

SCC = Self Consolidating Concrete

[2] The listed 28-day compressive strength is the minimum strength required to meet the design intent.

[3] The target W/CM ratio is to be determined by the contractor. During production the W/CM ratio shall be within + 0.05 of the target W/CM ratio. At no time may the W/CM ratio exceed 0.500, nor the total water content exceed 280 lbs/yd^3. For Class SCC, the maximum W/CM ratio shall be determined by the Contractor.

[4] See Subsection 501.03(b)(2).

[5] The Contractor shall determine the free shrinkage in accordance with Subsection 501.03(c)(3).

[6] The Contractor shall determine the surface resistivity in accordance with Subsection 501.03(c)(4).

[7] The Contractor shall determine a slump target that will allow enough workability to be placed and finished per Contract requirements. The slump shall be maintained within the specified range for the placement. The mix shall not exhibit segregation. If the mix does exhibit segregation or exceeds the maximum slump, the load shall be rejected and subsequent loads shall be tested by the Contractor until the mix meets the allowable limits.

[8] The Contractor shall determine the spread target and limits in accordance with Subsection 501.03(b)(1). The spread shall be maintained within the determined spread limits for the placement. The mix shall not exhibit segregation. If the mix does exhibit segregation or exceeds the upper spread limit, the load shall be rejected and subsequent loads shall be tested by the Contractor until the mix meets the allowable limits. The Engineer may perform a J-ring test at the time of placement if blocking is a concern.

If a nominal maximum aggregate size is not specified, the Contractor shall determine the nominal maximum aggregate size using guidance from *ACI 211.1* to do so. In no case will the maximum aggregate size exceed 1/5 of the narrowest dimension between sides of the forms, 1/3 the depth of slabs, nor 3/4 of the minimum clear spacing between individual reinforcing bars, bundles of bars, or pre-tensioning strands unless approved by the Engineer.

The Contractor may use industry methods to develop gradations not specified in Section 704 in order to create better optimized gradations to satisfy the required concrete performance characteristics. If the Contractor is using a combined gradation, they shall provide the method or methods of how they will monitor gradation, the limits of the gradation ranges, and the frequency of monitoring.

Lightweight fine aggregate may be used up to 30% by volume replacement for normal weight sand. The gradation of the lightweight fine aggregate shall conform to the requirements of *AASHTO M 195*. The lightweight fine aggregate shall be conditioned for enough time to fully saturate the material.

The stockpile shall be constructed so that it contains uniform moisture content throughout the pile. The stockpile will be allowed to drain 12 to 15 hours immediately prior to use, unless an alternate procedure is approved by the Structural Concrete Engineer. The Contractor shall state the method, duration and procedure used to confirm that the material is at or above its saturated surface dry (SSD) value, by weight, throughout the pile.

The mix may contain a shrinkage compensating admixture conforming to the requirements of *AASHTO M 194 M/M 194* or *ASTM C 494/C 494 M*.

The use of chlorides or admixtures containing chlorides is prohibited. All admixtures will be considered incidental to the work and included in the Contract Unit Price of the concrete.

The concrete shall have air content by volume as specified. The entrained air shall be obtained using an approved admixture.

The concrete materials may be proportioned using the absolute volumes method in accordance with the specified requirements. The volumetric proportioning method such as that outlined in *ACI 211.1*. or other approved volumetric proportioning methods, shall be employed in the mix design.

A minimum of 30 Calendar Days prior to placement of the trial pour (or prior to the pre-placement meeting, if the trial pour is waived by the Engineer), the Contractor shall submit for approval the mix design for the class of concrete specified. The mix designs shall be submitted to the Structural Concrete Engineer at the Agency's Materials Section Central Laboratory. No class of concrete shall be placed on a project, including the trial pour, until the mix design is approved.

(a) The mix design must contain the following information:

(1) Class of concrete.

(2) Type of mix, conventional or self-consolidating concrete (SCC).

(3) Specify if saturated surface dry or dry weights.

(4) Aggregates – Types, sources, specific gravities, and absorption values.

(5) Specified 28-day design compressive strength, psi.

(6) Cementitious content and the amount of each, pounds per cubic yard.

(7) Air content lower limit and upper limit, percent.

(8) Specified surface resistivity value.

(9) Slump range for conventional concrete, inches.

(10) Determined spread lower limit and upper limit for SCC.

(11) Water/cementitious materials (W/CM) ratio target value.

(12) Volumetric quantities of each material in the mix design.

(13) Design unit weight of the mix.

(14) Chemical Admixtures – Types, brand names, and dosages.

Concrete test mix or mixes shall be used to obtain the test results where applicable. All wet testing shall be done by personnel with current ACI Concrete Field Testing Technician Grade I certifications. All other tests shall be performed by an independent Laboratory that is accredited in the particular test method, or as allowed by the Engineer.

(b) The following preliminary mix qualification tests shall be performed:

(1) The contractor shall determine the lower and upper spread limit for SCC concrete. The J-Ring Test and the Spread Test will be conducted at both the lower and upper spread limits. The J-Ring Test will be conducted per the requirements of *ASTM C 1621/C 1621 M*, and the Spread Test will be conducted per the requirements of *ASTM C 1611/C 1611 M.*

The J-Ring test results shall be compared to the Spread Test results at both the upper and lower limits. The difference between the two tests at both the upper and lower limit shall not be greater than 2 inches. At both the upper and lower limits, the Visual Stability Index (VSI) shall not be greater than 1.

(2) The contractor shall provide test results that establish the quality of the entrained air void structure and the freeze-thaw durability of the concrete. Sampling shall be performed in accordance with *AASHTO R 60* on a trial batch of concrete that is a minimum of 3 cubic yards, and which meets the following requirements:

a. For all concrete, the air content shall be no more than 1.5% above the lower limit established in Table 501.03A.

b. For conventional concrete, the slump shall not exceed 5 inches.

c. For SCC concrete, the spread shall not be more than 5 inches greater than the minimum spread determined as specified in Subsection 501.03(b)(1), nor shall the spread exceed the maximum spread determined as specified in Subsection 501.03(b)(1).

Conventional concrete shall be tested for slump (*AASHTO T 119 M/T 119*), air content (*AASHTO T 152*), concrete temperature (*ASTM C 1064/C 1064 M*), and characterization of the air-void system of freshly mixed concrete by the sequential pressure method (*AASHTO TP 118*). The Contractor shall make a minimum of 2 concrete cylinders per *AASHTO T 23*.

SCC concrete shall be tested for spread (*ASTM C 1611/C 1611 M*, Procedure B), air content (*AASHTO T 152*), concrete temperature (*ASTM C 1064/C 1064 M*), and characterization of the air-void system of freshly mixed concrete by the sequential pressure method (*AASHTO TP 118*). The Contractor shall make a minimum of 2 concrete cylinders per *AASHTO T 23.*

The cylinders shall be cured for a minimum of 5 Calendar Days prior to being tested according to the requirements of *ASTM C 457*. The wet test results shall be included with the *ASTM C 457* results.

The tests required in Subsection 501.03(b)(2) will be used by the Agency to evaluate the quality of the entrained air void structure of the concrete. These test results will be used for informational purposes only and will not be used to determine the acceptability of the mix design.

(c) The additional mix qualification test results specified below shall accompany the mix design. Testing should be done on the same test batch where applicable.

(1) The concrete used to determine the additional mix qualification properties shall meet the following requirements:

a. For all concrete, the air content shall be not be more than 1.5% above the lower limit.

b. For conventional concrete, the slump shall be between 5 inches and 9 inches, and the W/CM ratio shall be 0.05 above the target.

c. For SCC concrete, the spread shall be within 5 inches of the maximum spread limit, and the W/CM ratio shall be the maximum W/CM ratio, as determined by the contractor.

(2) The compressive strength of the concrete shall be measured based on the requirements of *AASHTO T 22* for 7, 14, and 28-Calendar Day standard cured cylinders.

(3) The free shrinkage rate of the concrete shall be tested per the requirements of *AASHTO T 160*. The test specimen shall be a prism of 4 inch square cross section. Procedure 11.1.2 of *AASHTO T 160* shall be followed for storage and measurements, and all specified test age results shall be submitted. Specimen testing may be terminated after 28 Calendar Days of drying. Testing shall be performed by an independent Laboratory accredited in the specific test method.

(4) The surface resistivity of the test mix shall be measured at 28 and 56 Calendar Days based on the requirements of *AASHTO T 358*. Results shall be categorized as Low, Very Low, or Negligible in accordance with *AASHTO T 358*, Table 1.

(d) The Alkali-Silica Reactivity (ASR) of each type of aggregate shall be measured separately based on the requirements of *AASHTO T 303*. If one or more of the aggregates exceeds 0.10% expansion, then the aggregate shall be tested again according to the requirements of *ASTM C 1567*.

The Contractor may elect to go directly to *ASTM C 1567* testing if they suspect that the aggregate may exceed the 0.10% expansion if tested by *AASHTO T 303*. Testing shall be performed by an independent Laboratory accredited in the specific test method.

(e) After the mix design furnished by the Contractor has been reviewed and approved by the Structural Concrete Engineer, no new materials shall be incorporated. In no case shall concrete from more than one mix design be permitted to be used during the same pour without prior written approval of the Engineer.

Mix design approvals will be valid for a 12-month period. The approved mix design will be allowed a two consecutive year re-approval if no material proportioning or material sources have changed from the previous year's approved mix design and the mix design is submitted with updated aggregate properties and volumes adjusted accordingly. The aggregate properties shall be tested within 60 Calendar Days of the mix design submission. The properties to be tested include, but are not limited to, specific gravity, unit weight, and absorption. The mix design shall be accompanied by the previously completed and accepted test mix data and any applicable updated test information.

501.04 BATCHING is hereby modified by deleting paragraphs one, two and three in their entirety and replacing them with the following:

501.04 BATCHING. Measuring and batching of materials shall be done at an approved batch plant. Batch plants shall have an inspection completed prior to the first concrete placement on an Agency project if it has been longer than 12 calendar months from the last inspection. Request for inspection and required documentation must be received by the Materials Testing and Certification Section a minimum of 21 Calendar Days prior to the date of the requested inspection.

All deficiencies shall be corrected and verified a minimum of 5 Calendar Days prior to the first concrete placement for any Agency project. The batch plant shall meet the requirements of *AASHTO M 157*, except as modified in these Specifications, and shall always be maintained in good repair. The batch plant shall be subject to periodic inspections by Authorized Representatives of the Agency. The batch plant shall have approved methods of storing, measuring, and dispensing approved mineral admixtures.

All concrete batch plants offered for Agency approval shall be equipped for semi-automatic batching and proportioning of all cementitious material, aggregates, water, and for the automatic insertion of admixtures. The plants shall be equipped to automatically and accurately record, report, and print batch weight tickets in English units the quantity of all aggregates, cementitious material, and the water incorporated into each batch and shall identify and record the addition of the required admixtures. All materials added to the concrete batch after initial batching shall be added to the printed batch weight ticket prior to delivery.

501.05 MIXING AND DELIVERY, parts (a)(2) and (a)(3), are hereby modified by being deleted in their entirety and replaced with the following:

(2) Authorization by Field Inspection personnel must be obtained prior to the addition of water or admixtures at the project site. If water is added in excess of the specified maximum W/CM ratio, the concrete shall not be used.

(3) Each load of concrete delivered at the job site shall be accompanied by a State of Vermont Batch Slip signed by the authorized Agency representative, if present, at the plant. If an Agency representative is not present at the time of batching, a batch weight ticket meeting the requirements of Subsection 501.04 shall accompany the delivery vehicle.

SECTION 506 – STRUCTURAL STEEL

506.02 MATERIALS is hereby modified by deleting the second entry in the Subsection listing and replacing it with the following:

Structural Steel Coating Systems.....708.03

506.02 MATERIALS is hereby modified by inserting the following as the third entry in the Subsection listing:

Grease Rustproofing Compound.....708.04

506.03 GENERAL FABRICATION REQUIREMENTS is hereby modified by deleting paragraphs three, four, five, and six in their entirety and replacing them with the following:

Prior to performing any work under this Section, the fabricator must have received approval for all Fabrication Drawings, welding procedures and any special Contract requirements and have notified the Agency's Structural Steel Fabrication Engineer in writing at least 10 Working Days in advance of fabrication. The Contractor shall bear full responsibility and costs for all materials ordered, raw materials stockpiled, or for work performed prior to approval of the Fabrication Drawings or written authorization from the Structures Engineer.

Excepted as noted in this Subsection, all work shall be performed by the fabricator indicated on the approved Fabrication Drawings, unless otherwise authorized in writing by the Structural Steel Fabrication Engineer. For coatings, if the fabricator intends to use a Subcontractor, it shall be clearly outlined on the fabrication drawings to be submitted for review. At a minimum, the provided information shall include the Subcontractor's name and address; the name, phone number and e-mail address of the quality control (QC) contact; and an acknowledgement of the VTrans quality assurance (QA) inspection requirements which apply to the Subcontractor.

If the fabricator wishes to request the use of a Subcontractor for material processing (e.g. cutting, drilling, bending, rolling, punching, machining, etc.), they shall submit a set of the previously approved shop drawings to the Agency for review, with the requested changes and required information clearly marked and indicated (e.g. by making all additional notes red). At a minimum, the submittal shall include the Subcontractor's name and address; the name, phone number and e-mail address of the quality control (QC) contact; an acknowledgement of the VTrans quality assurance (QA) inspection requirements which apply to the Subcontractor; and clear information on the extent and limits of work to be performed by the Subcontractor

Requests will be evaluated on a case by case basis and may be rejected by the Agency for any reason. Use of a Subcontractor does not relieve the fabricator of any responsibilities or quality control requirements specified by the Contract.

Structural steel furnished under this Section shall be fabricated in a plant having an AISC Certified Bridge Fabricator – Advanced (ABR), or Intermediate (IBR) Certification, and in a plant approved by the Agency prior to Contract Execution. Structural steel components (such as bridge rail, bridge joints, and overhead sign structures) which are fabricated under this Section may be fabricated in a plant that does not have an ABR or IBR Certification, provided that the fabrication plant has either an AISC Certified Bridge Fabricator – Simple (SBR) Certification, or an AISC Bridge Component QMS Certification, and is approved by the Agency prior to Contract Execution.

Minor steel components, including, but not limited to, downspouts, scuppers, and pedestrian hand railings may be fabricated in a plant that does not have an ABR or IBR Certification, provided that the fabrication plant is approved in writing by the Structures Engineer prior to Contract Execution. All plants without certification shall have an organization, operation and equipment capable of producing a product equal to a certified plant.

Structural steel that is to be painted or metalized under this section shall be coated in a plant having an AISC Sophisticated Paint Endorsement – Enclosed, or SSPC-QP 3 – Enclosed Shop certification and which has been approved by the Agency prior to Contract Execution.

When certified fabrication or coating plants are required, the plant shall maintain certified status throughout the duration of the work under the Contract.

506.03 GENERAL FABRICATION REQUIREMENTS, part (c), is hereby modified by deleting subpart (1) in its entirety and replacing it with the following:

(1) Inspectors. Quality control inspectors shall be onsite full time during any hot work (e.g. burning, heating, welding, etc.), as well during as any operations that may affect the quality of the coating system.

a. Fabrication Inspectors. The fabricator's representative responsible for fabrication inspection, testing and quality matters shall be qualified and certified in accordance with the provisions of *AWS QC 1*.

b. Coating Inspectors. The fabricator's coatings quality control manager shall possess a minimum classification as a NACE Coating Inspector Level 2 – Certified. The coatings quality control inspector shall possess a minimum classification as a NACE Coating Inspector Level 1 – Certified.

506.03 GENERAL FABRICATION REQUIREMENTS, part (d)(3), is hereby modified by deleting the last sentence, which begins with "The Engineer reserves the right..." and replacing it with "The Structural Steel Fabrication Engineer reserves the right to reject inadequate office facilities and require suitable alternatives."

506.03 GENERAL FABRICATION REQUIREMENTS, part (e), is hereby modified by adding the word "Execution" as the last word of the subsection.

506.04 DRAWINGS AND PROCEDURES, part (c), is hereby modified by being deleted in its entirety and replaced it with the following:

(c) Welding Procedures. Detailed welding procedures shall be prepared in accordance with the provisions of the applicable AWS/ANSI/AASHTO code revisions and submitted in accordance with the following:

(1) All procedures shall be prequalified. Procedure qualification test records shall be submitted along with each procedure. Heat input values during welding shall be shown for each procedure.

(2) Welding procedure Specifications shall be presented in a format similar to *Form O-2* of *AWS D1.5,* Annex O (See Annex M for *AWS D1.1*). Procedure qualification test records shall be presented in a format similar to *Form O-3* and *Form O-4* of *AWS D1.5,* Appendix O (See Annex M for *AWS D1.1*).

(3) Details of welded joints not prequalified under *AWS D1.5,* Section 2.7 shall be qualified.

506.05 QUALITY ACCEPTANCE, part (b), is hereby modified by deleting the sentence "The QAI will have the authority to reject any material or work that does not conform to the Contract requirements." in its entirety.

506.06 QUALITY CONTROL, part (b), is hereby modified by being deleted in its entirety and replaced it with the following:

(b) Qualifications of Inspectors. Inspectors shall meet the requirements of Subsection 506.03(c).

506.10 WELDING, part (d), is hereby modified by adding the word "VTrans" immediately before the phrase "prequalified welder list." in the first paragraph, and by adding the word "VTrans" immediately before the phrase "*Field Welding Manual*" in the second paragraph.

506.10 WELDING, part (e)(1), is hereby modified by deleting the third and fourth paragraphs in their entirety. The deleted text begins with "Process and procedure qualification record tests..." and ends with "... similar to those provided in *AWS D1.5*."

506.12 ASSEMBLY, part (d), is hereby modified by adding "," (a comma) immediately following the phrase "All sharp corners".

506.12 ASSEMBLY, part (d), is hereby further modified by adding the word "minimum" immediately before the phrase "1/16 inch radius".

506.14 SURFACE PREPARATION is hereby modified by being deleted in its entirety and replaced it with the following:

506.14 SURFACE PREPARATION. All materials shall be blast-cleaned to the specified grade as defined by the *SSPC Painting Manual* and supplemented by reference to *SSPC-VIS 1*. Further preparation shall conform to the following:

(a) Surfaces to Remain Uncoated. Surfaces shall be blast-cleaned at least equivalent to Preparation Grade *SSPC-SP 10.* This work may be performed either before or after fabrication. The final surface appearance after fabrication shall be clean and free from any contaminants or blemishes so as to allow the metal to weather uniformly.

(b) Surfaces to be Coated. Prior to application of any coating, all material to be coated shall be cleaned and prepared in accordance with the appropriate Contract Specifications.

506.18 ERECTION, part (b), is hereby modified by deleting subparts (2) and (3) in their entirety and replacing them with the following:

(2) Drift pins shall be used to align and center the connections of main and secondary members. Only light drifting will be permitted. Any member subjected to drifting that results in distortion of the member or elongation of the holes will be rejected. Cylindrical erection pins, the same size as the hole, shall be used at least in the extreme corners of all main member connections.

Main members shall be match marked by the Fabricator and should fit together easily.

Main members shall not be reamed larger than the hole size indicated on the approved Fabrication Drawings without written authorization from the Project Manager. Secondary members may be subjected to limited field reaming with the written approval of the Engineer. Assembled parts that have been approved for field drilling or reaming shall be disassembled to remove any burrs, shavings, oils, or lubricants.

Pins used for hinged connections and bearings shall be inserted with care and aligned so the members take full and even bearing. Nuts shall be adequately tightened and locked in position either by upsetting the threads or tack welding the nut to the bolt.

(3) Errors in shop fabrication that prevent proper assembly shall be reported immediately to the Engineer. The Engineer shall approve any corrective action prior to it occurring.

506.19 BOLTING AND CONNECTIONS, part (a), is hereby modified by adding the phrase "Structural Steel Fabrication" immediately before the word "Engineer" in the last sentence of part (a).

506.19 BOLTING AND CONNECTIONS, part (b), is hereby modified by deleting the sentence which reads "Faying surfaces of bolted connections shall meet the Class B slip coefficient value of not less than 0.50 as specified by AASHTO." and replacing it with "Unless otherwise specified in the Contract Documents, faying surfaces of bolted connections shall have a Class B slip coefficient value of not less than 0.50 as specified by AASHTO."

506.19 BOLTING AND CONNECTIONS, part (c), is hereby modified by adding the sentence "Unless otherwise indicated on the plans, *ASTM F 3125/F 3125 M* Grade A 325 hex head bolts shall be used." immediately following the sentence "Bolts shall be tightened to develop a tension not less than 5% more than the minimum bolt tension specified in Table 506.19A."

506.19 BOLTING AND CONNECTIONS is hereby modified by relabeling part (d), "Acceptance of Bolt Tensioning." as "(e) Acceptance of Bolt Tensioning."

506.19 BOLTING AND CONNECTIONS is hereby further modified by adding a new part "(d) Bolt Tensioning Methods." The new part (d) will be composed of text that is currently located in part (c). The new part (d) will begin with the phrase "Bolts shall be tensioned by the Contractor in the presence of the Engineer…" and will contain all text and tables up to and including Note 4 of Table 506.19B.

All references to "Column 3 of Table 506.19B" within the text identified above shall be replaced with the phrase "Column 4 of Table 506.19B".

506.19 BOLTING AND CONNECTIONS, part (d)(1), is hereby modified by adding the sentence "This method shall only be used when required by the Contract." immediately following the sentence "This method shall be employed when installing button-headed or dome-headed high-strength bolts."

506.19 BOLTING AND CONNECTIONS, part (e), is hereby modified by deleting the phrase "or stick out not more than three threads" from the last sentence of the ninth paragraph.

506.23 UNCOATED STEEL is hereby modified by being deleted in its entirety and replaced with the following:

506.23 STEEL SURFACES AND COATINGS.

(a) Uncoated Steel. Care must be taken to keep chemicals and oils from contacting the exposed surfaces of unpainted steel during storage, erection, and construction of the deck.

(1) Staining of Masonry. The Contractor shall protect all concrete and masonry from staining due to oxide formation on the steel.

(2) Cleaning of Steel. After all concrete has been placed, the outside surface of the fascia beams and bottom surface of their lower flanges shall be cleaned of all foreign material to a uniform appearance. The Engineer may require the exposed surfaces to be blast cleaned to Preparation Grade *SSPC-SP 10*. The use of acids for cleaning is prohibited.

(b) Galvanized Steel. All steel surfaces to be galvanized per Contract Plans shall be coated in accordance with Subsection 726.08. Certifications as described in *ASTM A 123*, Section 10 for the completed products shall be furnished to the QA Inspector (or the Structural Steel Fabrication Engineer, if there is no QA Inspector assigned to the project) prior to shipment from the galvanizer's plant. Certifications shall include a report of all test results.

(c) Metalized Steel. All steel surfaces to be metalized per Contract Plans shall be metalized and seal coated in accordance with Subsection 726.09.

(d) Painted Steel. When the Contract Plans specify shop painted structural steel, the work shall be performed in accordance with the requirements of this Subsection.

(1) Materials. The fabricator shall provide a three coat paint system meeting the requirements of Subsection 708.03.

Shop applied systems may have isolated areas where the coatings were damaged during shipping or erection and will have areas around faying surfaces that may need field applied primer, intermediate, and top coatings. Thus, any coating system that is used in the shop shall be acceptable for the field conditions that are expected to be encountered.

(2) Submittals. The fabricator shall submit a complete package, in accordance with Subsection 105.03 for Construction Drawings, which includes the following information. The submittals shall be made sufficiently in advance of coating work to allow for review, resubmittals, and approval.

a. Surface Preparation/Painting Plan. The surface preparation/painting plan shall include the specified methods of surface preparation and type(s) of equipment to be utilized for removal of rust, mill scale, or foreign matter. The plan shall identify the solvents proposed for solvent cleaning, together with the solvent Safety Data Sheets (SDS). If any detergents, additives, or inhibitors are incorporated into the water used for any coating work operations, the plan shall include the names of the materials and their SDS.

The plan shall also include the methods of coating application, including any required stripe coats, and all equipment to be utilized.

The plan shall also identify all applicable QC/QA Hold Points. Specific inspection items throughout these specifications are designated as Hold Points. These Hold Points are for the QA Inspector to perform inspections. QA inspections will be performed only after a proper QC inspection by the fabricator. Permission to proceed beyond a Hold Point without a QA inspection will be granted solely at the discretion of the Structural Steel Fabrication Engineer, and only on a case-by-case basis. If re-work is necessary, as determined by a QA inspection, it shall be accomplished and a new Hold Point for the re-work shall be observed as defined above.

b. Abrasives. The fabricator shall submit the type of abrasives to be used for abrasive blast cleaning and their SDS. For expendable abrasives, the Contractor shall provide certification from the abrasive supplier that the abrasive meets the requirements of *SSPC-AB 1*. For steel grit abrasives, the certification shall indicate that the abrasive meets the requirements of *SSPC-AB 3*.

c. Coating System Information. The fabricator shall submit the latest version of the product manufacturer's application and thinning instructions, SDS, and product data sheets for each and every coating, thinner, sealer, and grease rustproofing compound. Specific attention shall be drawn to storage temperatures and the temperatures of the material, surface, and ambient air at the time of application. Recommended minimum ambient weather conditions during curing shall also be included A letter or written instructions from the coating manufacturer shall be provided indicating the length of time that each coat must be protected from cold or inclement weather (e.g. exposure to rain) during the drying/curing period.

When the Agency accepts the submittals, the fabricator will receive written notification. The fabricator shall not construe Agency 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 submittals does not relieve the fabricator from the responsibility to conduct the work according to 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 fabricator remains solely responsible for the adequacy and completeness of the programs and work practices, and adherence to them.

(3) Quality Control (QC) Inspections. The fabricator shall perform first line, in progress QC inspections. The personnel performing any QC tests shall be trained in coatings inspection and the use of the testing instruments. Documentation of training shall be provided upon request. Painters shall perform wet film thickness measurements, with the Quality Control Inspector conducting random spot checks of the wet film. Reports for all quality control testing and observations shall be completed and provided to the QA Inspector on a daily basis.

a. Fabricator QC inspections shall include, but are not limited to, the following:

1. Ambient conditions.

2. Compressed air cleanliness.

3. Surface preparation and surface profile (solvent cleaning, abrasive blast cleaning, etc.).

4. Coating application (materials verification, mixing, thinning, induction/sweat-in time, and wet/dry film thickness).

5. Recoat times and cleanliness between coats.

6. Coating continuity and coverage (freedom from runs, sags, overspray, dry spray, pinholes, shadow-through, skips, misses, etc.).

7. Records of fabricator QC inspections shall document any applicable product batch numbers.

b. The following equipment shall be provided by the fabricator as necessary to perform QC inspections:

1. Psychrometer or comparable equipment for the measurement of dew point and relative humidity, together with all necessary tables or psychrometric charts.

2. Surface temperature Digital Spot Thermometer.

3 *SSPC-VIS 1 - Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning* and *SSPC-VIS 3 - Visual Standard for Power and Hand-Tool Cleaned Steel*, as applicable.

4. Commercially available putty knife of a minimum thickness of 40 mils and a width between 1 and 3 inches.

5. Replica tape and spring micrometer.

6. Wet film thickness gauge.

7. Blotter paper for compressed air cleanliness checks.

8. Type 2 electronic dry film thickness gauge per *SSPC-PA 2 Measurement of Dry Coating Thickness with Magnetic Gauges.*

9. Calibration standards for dry film thickness gauge.

10. Light meter for measuring light intensity during surface preparation, painting, and inspection activities.

11. Printed copies of all applicable ASTM and SSPC Standards used for the work.

12. *SSPC Manual of Good Painting Practice, Volume 1*.

The instruments shall be calibrated within 12 months of the date of Project usage or according to the equipment manufacturer's recommendations and the fabricator's QC Program if they require a shorter duration.

(4) Quality Assurance (QA) Observations. The QA Inspector will conduct QA observations of any or all phases of the work. The presence or activity of QA Inspector observations in no way relieves the fabricator of the responsibility to provide all necessary daily QC inspections and to comply with all requirements of this specification.

The Structural Steel Fabrication Engineer has the right to reject any work that was performed without adequate provision for QA observations.

(5) Inspection Access and Lighting. The fabricator shall provide artificial lighting in areas where natural light is inadequate, to allow proper cleaning, inspection, and painting. Illumination for inspection shall be at least 30 foot-candles.

(6) Surface Preparation and Painting Equipment. All cleaning and painting equipment shall include gauges capable of accurately measuring fluid and air pressures and shall have valves capable of regulating the flow of air, water, or paint as recommended by the equipment manufacturer. The equipment shall be maintained in proper working order.

Hand tools, power tools, abrasive blast cleaning equipment, brushes, rollers, and spray equipment shall be of suitable size and capacity to perform the work required. All power tools shall be equipped with vacuums and High Efficiency Particulate Air (HEPA) filtration. Appropriate filters, traps, and dryers shall be provided for the compressed air used for abrasive blast cleaning and conventional spray application. Paint pots shall be equipped with air operated continuous agitation devices unless prohibited by the coating manufacturer. The air discharge from power tools and air motors shall be directed away from steel surfaces; if this is not possible a filtering device shall be appropriately placed.

(7) Ambient Conditions. Surfaces to be painted after cleaning shall remain free of moisture and other contaminants. The fabricator shall control operations to ensure that dust, dirt, or moisture does not come in contact with surfaces cleaned or painted that day. The following ambient conditions shall be met:

a. The surface and ambient temperatures shall be at least 5°F above the dew point during final surface preparation operations.

b. The surface and ambient temperatures shall be a minimum of 40°F, at least 5°F above dew point, and the maximum relative humidity shall be less than or equal to 85% during the application and cure/dry time of each coat of the paint system. If the manufacturer's published literature is more restrictive it shall be followed for specific temperature, dew point, and humidity conditions during the application cure/dry of each coat. The cure/dry time shall be measured as the time following application when the ambient conditions are within the ranges above.

The fabricator shall monitor and document temperature, dew point, and relative humidity at the beginning of each Work Day and every 4 hours during surface preparation and coating application, in the specific areas where the work is being performed. The frequency of monitoring shall increase if weather conditions are changing. If the weather conditions are forecast to be borderline relative to the limits established by the manufacturer, monitoring shall continue at a minimum of 4 hour intervals throughout the curing/drying period. The Structural Steel Fabrication Engineer has the right to reject any work that was performed under unfavorable weather conditions. Rejected work shall be removed, re-cleaned, and repainted at the fabricator's expense.

(8) Compressed Air Cleanliness. Prior to using compressed air for abrasive blast cleaning, blowing down the surfaces, and painting with conventional spray, the fabricator shall verify that the compressed air is free of moisture and oil contamination in accordance with the requirements of *ASTM D 4285*. The tests shall be conducted at least one time each shift for each compressor system in operation. If air contamination is evident, the fabricator shall change filters, clean traps, add moisture separators or filters, or make other adjustments as necessary to achieve clean, dry air. The fabricator shall also examine the work performed since the last acceptable test for evidence of defects or contamination caused by the compressed air. Affected work shall be repaired at the fabricator's expense.

(9) Surface Preparation and Profile (Hold Point).

a. Surface Preparation. All steel surfaces to be painted shall be prepared by dry abrasive blast cleaning to meet the requirements of *SSPC-SP 10*.

b. Abrasives. Abrasive blast cleaning shall be performed using either expendable abrasives (other than silica sand), or recyclable steel grit abrasives. Expendable abrasives shall be used one time and disposed of. The fabricator shall verify that recycled abrasives are free of oil contamination by conducting oil content tests in accordance with *SSPC-AB 2* on a daily basis.

c. Surface Profile. The abrasives used for blast cleaning shall have a gradation such that the abrasive will produce a uniform surface profile of 1.5 to 3.5 mils. If the profile requirements of the coating manufacturer are more restrictive, the fabricator shall advise the Structural Steel Fabrication Engineer and comply with the more restrictive requirements. For recycled abrasives, an appropriate operating mix shall be maintained in order to control the profile within these limits.

The surface profile produced by the fabricator's surface preparation procedures shall be determined by replica tape and spring micrometer at the beginning of the work, and each day that the surface preparation is performed. Areas having unacceptable measurements shall be further tested to determine the limits of the deficient area. The replica tape shall be attached to the daily report.

When unacceptable profiles are produced, work shall be suspended. The fabricator shall make the necessary adjustments to ensure that the correct surface profile is achieved on all surfaces. The fabricator shall not resume work until the new profile is verified by the QA observations and he/she confirms that the profile is acceptable.

d. Surface Condition Prior To Painting. Prepared surfaces shall meet the specified degrees of cleaning immediately prior to painting, and shall be painted before rusting appears on the surface. If rust appears or bare steel remains unpainted for more than 8 hours, the affected area shall be prepared again at the expense of the fabricator.

All surface preparation cleaning residue on steel surfaces shall be removed prior to painting.

The quality of surface preparation and cleaning of surface dust and debris must be accepted by the QA Inspector prior to painting. The Structural Steel Fabrication Engineer has the right to reject any work that was performed without adequate provision for QA observations to accept the degree of cleaning. Rejected coating work shall be removed and replaced at the fabricator's expense.

(10) General Paint Requirements. Paint storage, mixing, and application shall be accomplished according to these Specifications and as specified in the paint manufacturer's written instructions and product data sheets for the paint system used. In the event of a conflict between these specifications and the coating manufacturer's instructions and data sheets, the fabricator shall advise the Structural Steel Fabrication Engineer and comply with the most restrictive requirements.

a. Paint Storage and Mixing. All paint shall be stored according to the manufacturer's published instructions, including handling, minimum and maximum temperatures, and warming as required prior to mixing. 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. The paint shall be stored in a secure fireproof location.

Mixing shall be performed according to the manufacturer's instructions. Thinning shall be performed using thinner provided by the manufacturer, and only to the extent allowed by the manufacturer's written instructions. In no case shall thinning be permitted that would cause the coating to exceed the local Volatile Organic Compound (VOC) emission 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 according to the manufacturer's instructions, in the original containers 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. Manufacturer recommended induction/sweat-in times and temperature of mixed coatings shall be observed.

Multiple component coatings shall be discarded after the expiration of the pot life. Single component paint shall not remain in spray pots, paint buckets, etc. overnight and shall be stored in a covered container and remixed before use.

b. Paint Application. Unless prohibited by the coating manufacturer's written instructions, paint may be applied by spray methods, rollers, or brushes. If applied with conventional or airless spray methods, paint shall be applied in a uniform layer with overlapping at the edges of the spray pattern.

The painters shall monitor the wet film thickness of each coat during application. The wet film thickness shall be calculated based on the specified dry film thickness using the solids by volume of the material and the amount of thinner added.

When brushes or rollers are used to apply the coating, additional applications may be required to achieve the specified thickness per layer.

c. Re-coating and Film Continuity (Hold Point for Each Coat). Paint shall be considered dry for re-coating according to the re-coat time/temperature/humidity criteria provided in the manufacturer's instructions and when an additional coat can be applied without the development of film irregularities such as lifting, wrinkling, or loss of adhesion of the under coat.

d. Stripe Coats. Unless indicated otherwise in the Contract, the Contractor shall apply an additional stripe coat to edges, crevices, welds, and similar surface irregularities for the prime coat and intermediate coat. The stripe coat shall be applied by brush or roller, as per manufacturer's recommendations, such that the coating is thoroughly worked into or on the irregular surfaces, and shall extend onto the surrounding steel a minimum of 1 inch in all directions. The purpose of the stripe coat is to build additional thickness and to assure complete coverage of these areas.

The stripe coat shall not be applied as part of the application of the full coat. The stripe coat shall be applied and dried separately according to the manufacturer's recommended drying times. Also, the color of the stripe coat shall contrast with the colors used for the full coats immediately preceding and succeeding the stripe coat.

e. Coating Sequence. For locations painted under this specification, coatings shall be applied as follows:

1. Prime Coat. The full prime coat shall be applied first to protect the steel. Once the full prime coat has dried, the prime stripe coat shall be applied.

2. Intermediate Coat. After the prime stripe coat has dried, an intermediate stripe coat shall be applied and allowed to dry, followed by the full intermediate coat.

3. Top Coat. After the full intermediate coat has dried, the full top coat shall be applied.

(11) Coating Thickness. The dry film thicknesses of the full coats shall be as follows, as measured in accordance with *SSPC-PA 2*. If the manufacturer's upper or lower thickness limit is more restrictive, it shall be followed instead.

1. The prime coat of organic zinc-rich primer shall be between 3.5 and 5.0 mils dry film thickness.

2. The intermediate coat of epoxy or urethane shall be between 3.0 and 6.0 mils dry film thickness.

3. The finish coat of aliphatic urethane shall be between 2.5 and 4.0 mils dry film thickness. Finish coat color shall be according to Contract Documents.

(12) Amine Blush. Amine blush is a residue that can form on newly applied epoxy coating films under certain conditions. Amine blush often appears as a yellowish milky and/or a blotchy residue on the coating surface and is a deterrent to the adhesion of subsequently applied coating layers. If amine blush is detected, the Contractor shall provide the Engineer with written procedures from the coating manufacturer for complete removal prior to the application of additional coating layers.

Painting shall be done in a neat and workmanlike manner. Each coat of paint shall be applied as a continuous film of uniform thickness free of defects including, but not limited to, runs, sags, overspray, dry spray, pinholes, voids, skips, misses, and shadow-through. Defects such as runs and sags shall be brushed out immediately during application.

(13) Repair of Damage to New Coating System. The Contractor shall repair all damage to the newly installed coating system, at no cost to the Agency. If the damage extends to the substrate, the damaged areas shall be prepared to meet *SSPC-SP 3*.

The surrounding coating at each repair location shall be feathered for a minimum distance of 1-1/2 inches to achieve a smooth transition between the prepared areas and the existing coating.

If the bare steel is exposed, all coats shall be applied to the prepared area. If only the intermediate and finish coats are damaged, the intermediate and finish coats shall be applied. If only the finish coat is damaged, the finish coat shall be applied.

All Hold Points and specifications are applicable to the repair of damaged areas and areas concealed by containment.

(e) Grease Coating. When the Contract Plans specify that any steel surfaces are to be grease coated, all work shall be performed in accordance with Subsection 708.04.

Grease rustproofing compound shall be uniformly applied in a single coat by brush or spray at an approximate rate of 20 ft^2/gal to the steel as specified. This shall occur after all concrete form work has been removed, and after the final coat of paint, including repairs, has fully cured. A fully cured condition has occurred when a thumbnail driven into the coating surface does not leave an impression and when a thumb firmly pushed against the surface and twisted does not disturb the coating.

Surfaces adjacent to areas being grease coated shall be protected against over-spray. Non-metallic and stainless steel surfaces shall not be coated.

506.25 BASIS OF PAYMENT is hereby modified by being deleted in its entirety and replaced with the following:

506.25 BASIS OF PAYMENT. The accepted quantity of Structural Steel will be paid for at the Contract Unit Price per pound for the items specified in the Contract. Payment will be full compensation for furnishing, detailing, handling, transporting, and placing the materials specified, including nondestructive testing of welds; for preparing the surface of new steel to be painted, galvanized, metalized, or to remain unpainted; for necessary field cleaning; and for painting, metalizing, sealing, galvanizing, or grease coating of surfaces, unless otherwise paid for. Payment will also be full compensation for furnishing and implementing the erection plan, and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Payment for Structural Steel on a lump sum basis will be full compensation for performing all work specified and for furnishing all labor, materials, tools, equipment, erection plans, and incidentals necessary to complete the work.

The Engineer may authorize progress payments in the following manner:

(a) A maximum of 15% of the estimated quantity may be paid when the Fabrication Drawings are approved for fabrication.

(b) A maximum of 75% of the estimated quantity may be paid when the steel has been entirely completed and accepted per the approved Fabrication Drawings, stored in a location and manor accepted by the Structural Steel Fabrication Engineer, and all applicable material certifications have been approved.

(c) A maximum of 90% of the estimated quantity may be paid when the steel has been erected, falsework removed, and painting of connections, and "touch-up" completed where required.

(d) After completion and acceptance of all work under this Section, including extended weights being received and checked, 100% of the quantity will be paid.

All nondestructive testing and required quality control activities will be considered incidental to fabrication, and no separate payment will be made.

Payment will be made under:

Pay Item	Pay Unit
506.50 Structural Steel, Rolled Beam	Pound
506.55 Structural Steel, Plate Girder	Pound
506.56 Structural Steel, Curved Plate Girder	Pound
506.57 Structural Steel, Truss	Pound
506.60 Structural Steel	Pound
506.75 Structural Steel	Lump Sum

SECTION 510 – PRESTRESSED CONCRETE

510.12 GROUT, part (b), is hereby modified by deleting the phrase "requirements of Subsection 707.03(c)(1) and Subsection 707.03(c)(3)." from the fifth paragraph and replacing it with the phrase "requirements of Subsection 707.03(a)(1) and Subsection 707.03(a)(3)."

SECTION 516 – EXPANSION DEVICES

516.02 MATERIALS is hereby modified by deleting the fourth entry, "Asphalt Plug Bridge Joint.....707.15", from the Subsection listing and replacing it with the following:

Asphaltic Plug Joints for Bridges 707.15

SECTION 519 – SHEET MEMBRANE WATERPROOFING

519.02 MATERIALS is hereby modified by being deleted in its entirety and replaced with the following:

519.02 MATERIALS. Materials shall meet the requirements of the following Subsections:

Waterproofing Membrane System, Type I .....726.11(a)
Waterproofing Membrane System, Type II .....726.11(b)

Spray applied membranes shall be a Waterproofing Membrane System, Type I, and torch applied membranes shall be a Waterproofing Membrane System, Type II.

SECTION 524 – JOINT SEALER

524.02 MATERIALS is hereby modified by deleting the sixth entry, "Asphalt Plug Bridge Joint.....707.15", from the Subsection listing and replacing it with the following:

Asphaltic Plug Joints for Bridges 707.15

SECTION 540 – PRECAST CONCRETE

540.02 MATERIALS is hereby modified by deleting the twenty eighth material entry, "Sheet Membrane Waterproofing, Preformed Sheet.....726.11", from the Subsection listing and replacing it with the following:

Waterproofing Membrane System, Type III.....726.11(c)

540.10 INSTALLATION, part (c), is hereby modified by deleting the phrase "requirements of Subsection 726.11." from the fifth paragraph and replacing it with the phrase "requirements of Subsection 726.11(c)."

540.11 GROUT, part (b), is hereby modified by deleting the phrase "requirements of Subsection 707.03(c)(1) and Subsection 707.03(c)(3)." from the fifth paragraph and replacing it with the phrase "requirements of Subsection 707.03(a)(1) and Subsection 707.03(a)(3)."

540.12 POST-TENSIONING is hereby modified by deleting the phrase "requirements of Subsection 510.12(b)." from the second paragraph and replacing it with the phrase "requirements of Subsection 540.11(b)."

540.14 BASIS OF PAYMENT, part (b), is hereby modified by deleting the word "prestressed" and replacing it with the word "precast".

SECTION 543 – CONTRACTOR-FABRICATED PRECAST CONCRETE STRUCTURE

543.04 SUBMITTALS is hereby modified by deleting the first paragraph, which begins with "As soon as practical after award..." and ends with "...submitted as separate submittals", in its entirety and replacing it with the following:

As soon as practical after award of the Contract, all required information shall be prepared and submitted. Fabrication Drawings and erection plans shall be submitted as separate submittals.

SECTION 605 – UNDERDRAINS

605.02 MATERIALS is hereby modified by adding the following as the eighth entry in the Subsection listing:

Geotextile for Underdrain Trench Lining.....720.05

605.02 MATERIALS is hereby further modified by deleting the sentence "Geotextile shall meet the requirements of Table 720.01A for Geotextile for Underdrain Trench Lining."

SECTION 625 – SLEEVES FOR UTILITIES

625.02 MATERIALS is hereby modified by deleting the eighth entry, "Asphalt Plug Bridge Joint.....707.15", from the Subsection listing and replacing it with the following:

Asphaltic Plug Joints for Bridges 707.15

625.02 MATERIALS is hereby further modified by deleting the fifteenth entry, "Well Casing.....741.01", from the Subsection listing.

SECTION 630 – UNIFORMED TRAFFIC OFFICERS AND FLAGGERS

630.01 DESCRIPTION is hereby modified by deleting the last sentence, which begins with "Flaggers and UTOs shall conform to..." and replacing it with "Flaggers and UTOs shall conform to the requirements of the Contract Documents and the current edition of the *MUTCD* and its latest revisions."

630.02 GENERAL, part (b), is hereby modified by being deleted in its entirety and replaced with the following:

(b) Safety Apparel. Traffic control personnel shall wear safety apparel in accordance with the most current edition of the *MUTCD* and its latest revisions. Traffic control personnel deemed to have unsuitable safety apparel by the Engineer shall be considered ineffective and shall be removed.

When operating during nighttime hours, between sunset and sunrise, traffic control personnel shall wear safety apparel meeting or exceeding performance Class 3 requirements of *ANSI/ISEA 107*, including Class E pants or gaiters.

630.04 FLAGGERS is hereby modified by deleting part (a) in its entirety and replacing it with the following:

(a) Requirements. The Contractor shall verify that Flaggers meet the following requirements. Flaggers shall have successfully completed a 4-hour training course taught by a certified instructor within the last 24 months and shall carry proof of training at all times when on the Project. Certified instructors shall have successfully completed one of the following courses:

(1) Associated General Contractors of VT Traffic Control Technician/Flagger Trainer Course

(2) American Traffic Safety Services Association Flagger Instructor Training Course

(3) National Safety Council Flagger Instructor Course

SECTION 631 – FIELD OFFICE

631.08 TESTING EQUIPMENT, GROUT is hereby modified by deleting "1 Set of specimen molds meeting the requirements of *AASHTO T 106 M/T 106*" and replacing it with the following:

Specimen molds meeting the requirements of *AASHTO T 106 M/T 106*. The number of molds shall be sufficient to perform both the acceptance testing required for the contract item and any necessary control of work testing. Each specimen mold shall be capable of producing 3 individual cubes.

631.09 METHOD OF MEASUREMENT is hereby modified by deleting the sentence "Upon entering the cost of the submitted bill into the next biweekly estimate, the Engineer will forward the original paid bill to the Construction Office to be retained with the Project records and will place a copy of the paid bill into the field office records." in its entirety.

SECTION 641 – TRAFFIC CONTROL

641.02 GENERAL CONSTRUCTION REQUIREMENTS is hereby modified by deleting paragraphs four, five, six and seven in their entirety and replacing them with the following:

(a) Traffic Control. When the Contract includes the Traffic Control Pay Item, the Plans will contain an Agency-designed traffic control plan. The Contractor may implement the Agency-designed plan or submit an alternate traffic control plan for the Project. When the Contractor will implement an Agency-designed traffic control plan, written certification shall be submitted to the Engineer indicating that traffic control will be performed in accordance with the Agency design. An alternate plan may be for the entire traffic control plan of the Project or for revisions to various phases of the Agency's design in the Plans, including the specific location of the lanes where the traffic will be maintained. Any alternate plan submitted shall conform to the latest edition of the *MUTCD*.

For an alternate traffic control plan, Construction Drawings shall be submitted in accordance with Section 105. The submitted alternative plan shall include complete construction details, including all aspects of traffic control, to the same extent provided in the Agency design. The Contractor shall allow the Agency 30 Calendar Days to Review the proposed plan for Conformance before it is to be implemented.

(b) Traffic Control, All-Inclusive. When the Contract includes the Traffic Control, All-Inclusive Pay Item, the Contractor shall design and submit a site-specific traffic control plan in accordance with Section 105. The submitted site-specific plan shall include, for each phase of construction requiring a significant change in temporary traffic control, a narrative description of the proposed temporary traffic control for each phase, including pedestrian accommodations where appropriate, and the major work activities to be completed in each phase.

The submitted site-specific plan shall also include a layout for each phase of construction showing existing lane configurations, existing traffic control devices (signs, signals, and pavement markings), driveways, ramps, and highway intersections, and the location of all proposed temporary traffic control devices, Flaggers, and UTOs. All pertinent dimensions, such as taper lengths, sign spacing, temporary lane widths, and distances from existing traffic control devices shall be labeled.

641.03 TRAFFIC CONTROL DEVICES is hereby modified by adding the following as the thirteenth paragraph, immediately following the phrase "each consisting of a maximum of three lines of eight characters.":

Each PCMS unit shall be tamper-resistant. The control cabinet shall be locked when not in use. Each PCMS shall also have a security system that will only allow access if a code or password is entered. The default code or password shall be changed upon deployment of the PCMS by the Contractor. PCMS boards featuring remote access shall also be password protected.

641.07 BASIS OF PAYMENT is hereby modified by being deleted in its entirety and replaced with the following:

641.07 BASIS OF PAYMENT.

(a) Traffic Control and Traffic Control, All-Inclusive. The accepted quantity of Traffic Control and Traffic Control, All-Inclusive will be paid for at the Contract lump sum price. Payment will be full compensation for designing, preparing, implementing, inspecting, maintaining, and removing the applicable traffic control plan and specified traffic control devices, and for furnishing all labor (including traffic patrol vehicle operators, if used by the Contractor), tools, materials, equipment, and incidentals necessary to complete the work.

Partial payments for Traffic Control and Traffic Control, All-Inclusive will be made as follows:

(1) The first 15% of the Contract lump sum price will be paid upon receipt of written certification from the Contractor that traffic control will be performed in accordance with the Agency-designed traffic control plan, or upon approval of the Contractor's traffic control plan.

(2) The remaining 85% of quantity payments will be paid on a prorated basis for the estimated duration of the Contract work remaining.

(b) Portable Changeable Message Sign and Portable Arrow Board. The accepted quantities of Portable Changeable Message Sign and Portable Arrow Board will be paid for at the Contract Unit Price for each. There will be no payment for any spare units, as they shall be considered incidental to the unit(s) being utilized and paid for through the Contract.

Partial payment for Portable Changeable Message Sign and Portable Arrow Board will be made as follows:

(1) The first 50% of quantity payments will be made upon the erection of complete Portable Changeable Message Sign(s) and Portable Arrow Board(s) as specified in Subsection 641.06.

(2) The remaining 50% of quantity payments will be paid on a prorated basis for the estimated duration of the Contract work remaining.

The accepted quantities of Portable Changeable Message Sign Rental and Portable Arrow Board Rental will be paid for at the Contract Unit Price per day. The minimum quantity for payment shall be five days.

Payment for the accepted quantities of Portable Changeable Message Sign, Portable Arrow Board, Portable Changeable Message Sign Rental, and Portable Arrow Board Rental shall be full compensation for furnishing, operating, maintaining, transporting, and installing the unit specified, for removing the unit when it is no longer needed, and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

When both Pay Items are in the Contract, a Portable Changeable Message Sign used as a Portable Arrow Board will be paid for at the Contract price for a Portable Arrow Board.

Payment will be made under:

Pay Item	Pay Unit
641.10 Traffic Control	Lump Sum
641.11 Traffic Control, All-Inclusive	Lump Sum
641.15 Portable Changeable Message Sign	Each
641.16 Portable Arrow Board	Each
641.17 Portable Changeable Message Sign Rental	Day
641.18 Portable Arrow Board Rental	Day

SECTION 646 – RETROREFLECTIVE PAVEMENT MARKINGS

646.02 MATERIALS is hereby modified by deleting the ninth through sixteenth entries in the Subsection listing and replacing them with the following:

Line Striping Targets	708.12(a)
Pavement Marking Mask	708.12(b)
Pavement Marking Tape, Type A	754.03(a)
Pavement Marking Tape, Type B	754.03(b)
Pavement Marking Tape, Type C	754.03(c)

646.04 APPLICATION OF MARKINGS, GENERAL, part (a), is hereby modified by deleting both instances of the phrase “cold planing” from the second sentence (which begins with “During paving and cold planing, work shall be...”) of the sixth paragraph, and replacing them with the word “milling”.

646.07 DURABLE PAVEMENT MARKINGS, parts (a) and (b), are hereby modified by being deleted in their entirety and replaced with the following:

(a) Pavement Marking Tape, Type A. Pavement Marking Tape, Type A, when used as a final durable marking, shall be applied in a recess as defined in Subsection 646.09, and shall be applied in accordance with the manufacturer's requirements.

(b) Pavement Marking Tape, Type B. Pavement Marking Tape, Type B, when used as a final durable marking, shall be applied in a recess as defined in Subsection 646.09, and shall be applied in accordance with the manufacturer's requirements.

646.07 DURABLE PAVEMENT MARKINGS, is hereby further modified by deleting part (c), "Pavement Marking Tape, Type C" and part (d), "Pavement Marking Tape, Type D", in their entirety.

646.07 DURABLE PAVEMENT MARKINGS is hereby further modified by relabeling parts (e) and (f) as parts (c) and (d).

646.07 DURABLE PAVEMENT MARKINGS is hereby further modified by adding the following as the new part (e):

(e) Preformed Thermoplastic. Preformed thermoplastic shall be one of the Thermoplastic Pavement Markings, Type B listed on the Agency's *Approved Products List*.

646.07 DURABLE PAVEMENT MARKINGS is hereby further modified by relabeling part (g), "Polyurea Paint." as "(f) Polyurea Paint."

646.07 DURABLE PAVEMENT MARKINGS, parts (c)(1) and (f)(1), are both hereby modified by deleting the phrase "paver-placed pavement" from each part and replacing it with the phrase "bonded wearing course".

646.08 TEMPORARY PAVEMENT MARKINGS is hereby modified by relabeling part (a), "Temporary Pavement Marking Tape." as "(a) Pavement Marking Tape, Type C."

646.09 OTHER RELATED MARKINGS, Table 646.09A, is hereby further modified by deleting the first row and replacing it with the following:

Marking Material	Recess Depth (mils)

646.13 METHOD OF MEASUREMENT is hereby modified by deleting the seventh paragraph in its entirety. The deleted text begins with "The quantity of Raised Pavement Markers, Type II..." and ends with "... and removed when no longer needed."

646.14 BASIS OF PAYMENT is hereby modified by deleting the phrase "raised pavement markers," from the first sentence (which begins with "The Contract Unit Price for pavement marking items...") of the eleventh paragraph.

646.14 BASIS OF PAYMENT is hereby further modified by deleting the twelfth and thirteenth paragraphs in their entirety. The deleted text begins with "The accepted quantity of Raised Pavement Markers, Type II..." and ends with "... will be considered incidental to the Contract Item Raised Pavement Markers, Type II."

646.14 BASIS OF PAYMENT is hereby further modified by deleting the pay item "646.75 Raised Pavement Markers, Type II..... Each".

SECTION 649 – GEOTEXTILE FABRIC

649.02 MATERIALS is hereby modified by being deleted in its entirety and replaced with the following:

649.02 MATERIALS. Materials shall meet the requirements of the following Subsections:

Geotextile for Roadbed Separator.....720.02
Geotextile Under Railroad Ballast.....720.03
Geotextile Under Stone Fill.....720.04
Geotextile for Underdrain Trench Lining.....720.05
Geotextile for Filter Curtain.....720.06

Geotextiles shall conform to the following:

(a) Where sewn seams are used, the Contractor shall furnish the manufacturer's wide strip tensile test results as part of the certification. The results must verify that the seam meets or exceeds the specified average minimum roll values for the grab tensile strength of the geotextiles, or wide strip tensile strength for reinforcement applications.

(b) Field seams, where used, shall be in accordance with the manufacturer's recommendations.

SECTION 653 – EROSION PREVENTION AND SEDIMENT CONTROL

653.02 MATERIALS is hereby modified by inserting the following as the fourth and fifth entries in the Subsection listing:

Geotextile Under Stone Fill.....720.04
Geotextile for Silt Fence.....720.07

653.02 MATERIALS is hereby further modified by deleting the phrase "Geotextile Under Stone Fill shall be in accordance with Section 720 and Table 720.01A. Geotextile for Silt Fence shall be in accordance with Section 720 and Table 720.01A."

653.08 RUNOFF CONTROL MEASURES is hereby modified by deleting the first paragraph of Subsection 653.08(a)(1) in its entirety and replacing it with the following:

(1) Check Dam, Type I. Check Dam, Type I shall be placed in channels and on Geotextile Under Stone Fill meeting the requirements of Subsection 720.04.

653.08 RUNOFF CONTROL MEASURES is hereby further modified by deleting Subsection 653.08(b)(1) and Subsection 653.08(b)(2) in their entirety and replacing them with the following:

(1) Silt Fence, Type I. Silt Fence, Type I shall be constructed of posts and Geotextile for Silt Fence meeting the requirements of Subsection 720.07.

(2) Silt Fence, Type II. Silt Fence, Type II shall be constructed of posts, Geotextile for Silt Fence meeting the requirements of Subsection 720.07, and woven wire reinforcement.

653.09 TREATMENT MEASURES is hereby modified by deleting the second paragraph of Subsection 653.09(a), beginning with "Stabilized Construction Entrances shall be constructed of stone...", in its entirety and replacing it with the following:

Stabilized Construction Entrances shall be constructed of stone meeting the requirements of Subsection 704.17 and shall be placed on top of Geotextile Under Stone Fill meeting the requirements of Subsection 720.04.

653.09 TREATMENT MEASURES is hereby further modified by deleting the third paragraph of Subsection 653.09(b)(1), beginning with "Stake and fabric devices...", in its entirety and replacing it with the following:

Stake and fabric devices shall be constructed of Geotextile for Silt Fence meeting the requirements of Subsection 720.07 and stakes approved by the Engineer.

653.09 TREATMENT MEASURES is hereby further modified by deleting the second paragraph of Subsection 653.09(b)(3), beginning with "Inlet Protection Device, Type III shall be constructed of Aggregate...", in its entirety and replacing it with the following:

Inlet Protection Device, Type III shall be constructed of Aggregate for Erosion Prevention and Sediment Control and shall be placed on top of Geotextile Under Stone Fill meeting the requirements of Subsection 720.04.

SECTION 675 – TRAFFIC SIGNS

675.02 MATERIALS is hereby modified by deleting the first entry, "Paint for Traffic Signs.....708.06", from the Subsection listing.

675.07 TRAFFIC SIGNS is hereby modified by deleting part (b)(2) in its entirety and replacing it with the following:

(2) Flat Sheet Aluminum. Fabrication of the flat aluminum sheets, including cutting to size, shall be completed prior to degreasing, etching, or treating, and application of the retroreflective sheeting. Flat sheet aluminum may be sheared, blanked, sawed, or milled. No flame cutting will be permitted. Field drilling or punching of holes will be allowed as needed.

675.07 TRAFFIC SIGNS is hereby further modified by adding the following as the second and third sentences of part (d), immediately after the sentence beginning "Signs shall be mounted as tightly to the posts, frame, or...":

For permanent installations of Type A signs to frames or posts, a nylon-insert locking nut and two washers shall be used. For all sign types, if bolts are used for mounting, the installed bolt shall be at least flush with the nut.

SECTION 677 – OVERHEAD TRAFFIC SIGN SUPPORTS

677.03 GENERAL is hereby modified by adding the sentence "Field verification testing for Direct Tension Indicators is not required." immediately following the sentence "High-Strength Bolts, Nuts, and Washers shall be tensioned in accordance with Subsection 506.19."

SECTION 678 – TRAFFIC CONTROL SIGNALS

678.09 ERECTION OF POSTS AND POLES is hereby modified by adding the sentence "Field verification testing for Direct Tension Indicators is not required." immediately following the sentence "High-Strength Bolts, Nuts, and Washers shall be tensioned in accordance with Subsection 506.19."

SECTION 679 – STREET LIGHTING

679.02 MATERIALS is hereby modified by deleting the fifth material entry, "Bracket Arms.....753.04", from the Subsection listing.

679.02 MATERIALS is hereby further modified by inserting the following as the fifth and sixth entries in the Subsection listing:

Bracket Arms, Aluminum.....753.04(a)
Bracket Arms, Steel.....753.04(b)

679.05 BRACKET ARMS is hereby modified by deleting the first sentence of the Subsection and replacing it with the following:

Bracket arms shall be free of defects and burrs. Bracket arms shall be able to withstand a vertical load of 100 pounds and a horizontal load of 50 pounds without fracture or permanent deformation and shall be installed as shown in the Contract Documents.

Bracket arms installed on aluminum posts shall be in accordance with Subsection 753.04(a). Bracket arms installed on steel or wood posts shall be in accordance with Subsection 753.04(b).

SECTION 680 – TRAVEL INFORMATION SIGNS

680.02 MATERIALS is hereby modified by deleting the second entry, "Paint for Traffic Signs.....708.06", from the Subsection listing.

SECTION 702 – BITUMINOUS MATERIALS

702.06 APPLICATION TEMPERATURE RANGES, is hereby modified by deleting Table 702.06A in its entirety and replacing it with the following:

TABLE 702.06A – EMULSIFIED ASPHALT APPLICATION TEMPERATURE RANGES

Emulsified Asphalt Type	Temperature Range (°F)		Temperature Range (°C)	
	Spray	Mix	Spray	Mix
	Min. – Max.	Min. – Max.	Min. – Max.	Min. – Max.
RS-1	70 – 170	--	21 – 77	--
RS-2, CRS-1	120 – 160	--	49 – 71	--
CRS-2	140 – 175	--	60 – 79	--
RS-1h, CRS-1h	70 – 170	--	21 – 77	--
SS-1h, CSS-1h	75 – 130	50 – 130	24 – 54	10 – 54
MS-2h, CMS-2h	--	75 – 140	--	24 – 60

SECTION 704 – AGGREGATES

704.10 AGGREGATE FOR BITUMINOUS CONCRETE PAVEMENT, part (a), is hereby modified by deleting the reference to "*ASTM C 295/C 295 M (Modified)*" from the end of the sentence that begins with "Manufactured sand may be substituted for..." and replacing it with "*AASHTO T 304*".

704.10 AGGREGATE FOR BITUMINOUS CONCRETE PAVEMENT, part (a)(3), is hereby modified by deleting the reference to "*ASTM D 5821*" from the end of the sentence that begins with "When crushed gravel is used as coarse aggregate in Marshall bituminous..." and replacing it with "*AASHTO T 335*".

704.10 AGGREGATE FOR BITUMINOUS CONCRETE PAVEMENT, part (a)(3)a., is hereby modified by deleting "Measurement is made using test method *ASTM D 5821*, *Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate*." and replacing it with "Measurement is made using test method *AASHTO T 335*."

SECTION 707 – JOINT MATERIALS

707.14 PREFORMED JOINT FILLER, Table 707.14A, is hereby modified by deleting the reference to "*AASHTO T 42 /*" from the third column.

707.15 ASPHALTIC PLUG JOINTS FOR BRIDGES is hereby modified being deleted in its entirety and replaced with the following:

707.15 ASPHALTIC PLUG JOINTS FOR BRIDGES. Asphaltic Plug Joints for Bridges shall be single and/or multiple layer systems consisting of asphaltic binder, aggregate, closed cell foam expansion joint filler, and steel bridging plate, as applicable. Asphaltic Plug Joints shall be in accordance with *ASTM D 6297* and shall be one of the products listed on the Agency's *Approved Products List*.

707.17 ASPHALTIC PLUG JOINT BINDER is hereby made a new subsection of the specifications as follows:

707.17 ASPHALTIC PLUG JOINT BINDER. Asphaltic Plug Joint Binder shall be a thermoplastic polymeric-modified asphalt in accordance with *ASTM D 6297* and shall be one of the products listed on the Agency's *Approved Products List*.

SECTION 708 – PAINTS, STAINS, AND TRAFFIC MARKING MATERIALS

708.03 APROVED STRUCTURAL COATING SYSTEMS is hereby modified by being deleted in its entirety and replaced with the following:

708.03 STRUCTURAL STEEL COATING SYSTEMS. Acceptable structural steel coating systems shall be one of the systems listed on the Agency's *Approved Products List*, listed on the *NEPCOAT Qualified Products List B*, and shall meet the following requirements:

(a) System. The structural steel coating system shall be a three-coat system with a prime, intermediate, and top coat. Components of different systems shall not be intermixed.

(b) Color. Individual coats shall have contrasting colors. The finish color of the top coat shall be green, black, or brown as specified in the Contract Documents, and shall conform to *SAE AMS-STD 595* for the respective chip number as specified in Table 708.03A.

TABLE 708.03A – COLORS FOR STRUCTURAL COATING SYSTEMS

Color	Chip Number
Green	14062
Black	27038
Brown	20059

Damage to structural steel coating systems shall be repaired with a compatible structural steel coating system as specified herein.

708.06 PAINT FOR TRAFFIC SIGNS is hereby modified by being deleted in its entirety and replaced with the following:

708.06 THIS SUBSECTION RESERVED.

708.08 PAINT FOR PAVEMENT MARKINGS is hereby modified by adding the following two rows to Table 708.08C, immediately after the row for "Close cup flash point".

Viscosity	*ASTM D 562*	78 Krebs min./ 95 Krebs max.	78 Krebs min./ 95 Krebs max.
Dry Time	*ASTM D 711*	10 minutes max	10 minutes max.

SUBSECTION 708.11 PAVEMENT MARKING TAPE is hereby modified by being deleted in its entirety and replaced with the following:

708.11 THIS SUBSECTION RESERVED

708.12 TEMPORARY DELINEATION SYSTEMS is hereby modified by being deleted in its entirety and replaced with the following:

708.12 TEMPORARY DELINEATION SYSTEMS.

(a) Line Striping Targets. Acceptable Line Striping Targets shall be one of the Line Striping Targets on the Agency's *Approved Products List*.

(b) Pavement Marking Mask. Acceptable Pavement Marking Mask shall be one of the Masking Marking Tapes on the Agency's *Approved Products List*.

SECTION 711 – CULVERTS, STORM DRAINS, AND SEWER PIPES, METAL

711.02 CORRUGATED ALUMINUM ALLOY PIPE, PIPE ARCHES, AND UNDERDRAINS, part (a)(2)c., is hereby modified by deleting the phrase "requirements of Subsection 711.01(a)(2)c." and replacing it with the phrase "requirements of Subsection 711.01(a)(1)c."

SECTION 713 – REINFORCING STEEL, STRAND, AND WELDED WIRE REINFORCEMENT

713.04 COLD DRAWN STEEL WIRE is hereby modified by deleting the reference to "*AASHTO M 32 M/M 32*"and replacing it with "*AASHTO M 336 M/M 336*".

713.05 WELDED WIRE REINFORCEMENT is hereby modified by deleting the phrase "*AASHTO M 55 M/M 55* or *AASHTO M 221 M/M 221*"and replacing it with "*AASHTO M 336 M/M 336*".

SECTION 714 – STRUCTURAL STEEL

714.05 HIGH-STRENGTH BOLTS, NUTS, AND WASHERS is hereby modified by deleting the first sentence in its entirety and replacing it with the following:

High-strength bolts shall conform to the requirements of *ASTM F 3125/F 3125 M,* Grade A 325, including rotational capacity testing, for each lot of fasteners.

714.06 HEAT-TREATED STEEL STRUCTURAL BOLTS is hereby modified by deleting the first sentence in its entirety and replacing it with the following:

Heat-treated steel structural bolts shall conform to the requirements of *ASTM F 3125/F 3125 M,* Grade A 490, including rotational capacity testing, for each lot of fasteners.

SECTION 720 – GEOTEXTILES

SECTION 720 – GEOTEXTILES is hereby modified by being deleted in its entirety and replaced with the following:

SECTION 720 – GEOTEXTILES

720.01 GENERAL. Geotextiles shall be evaluated in accordance with the NTPEP geotextiles work plan and in compliance with the NTPEP audit program for geotextiles. Geotextiles shall be one of the products listed on the Agency's *Approved Products List* for the respective material specification.

720.02 GEOTEXTILE FOR ROADBED SEPARATOR. Geotextile for Roadbed Separator shall conform to *AASHTO M 288*, Table 1, Class 1 for Geotextile Strength Property Requirements, and shall conform to *AASHTO M 288*, Table 3 for Separation Geotextile Property Requirements.

720.03 GEOTEXTILE UNDER RAILROAD BALLAST. Minimum Average Roll Values (MARV) for Geotextile Under Railroad Ballast shall be as required in Table 720.03A.

TABLE 720.03A – MARV FOR GEOTEXTILE UNDER RAILROAD BALLAST

Geotextile Property	Test Method	MARV
Elongation Criteria at Failure [1]	*ASTM D 4632/ D4632 M*	≥ 50%
Grab Strength (lbs)	*ASTM D 4632/ D4632 M*	225
Tear Strength (lbs)	*ASTM D 4533/ D 4533 M*	115
Puncture Strength (lbs)	*ASTM D 6241*	850
Permittivity (s^{-1})	*ASTM D 4491/ D 4491 M*	0.70
Apparent Opening Size (mm)	*ASTM D 4751*	0.212 max. (No. 70 Sieve)
UV Resistance (% Strength Retained)	*ASTM D 4355/ D 4355 M*	70% at 500 hours of exposure
Structure	--	Nonwoven only

[1] Elongation corresponds to Maximum Grab Tensile Strength as measured in accordance with the requirements of *ASTM D 4632/D 4632 M*.

720.04 GEOTEXTILE UNDER STONE FILL. Geotextile Under Stone Fill shall conform to *AASHTO M 288,* Table 1, Class 1 for Geotextile Strength Property Requirements, and shall conform to *AASHTO M 288,* Table 5 for Stabilization Geotextile Property Requirements. Geotextile structure shall not be slit film.

720.05 GEOTEXTILE FOR UNDERDRAIN TRENCH LINING. Geotextile for Underdrain Trench Lining shall conform to *AASHTO M 288*, Table 1, Class 3 for Geotextile Strength Property Requirements, with a minimum elongation of 20%. Geotextile for Underdrain Trench Lining shall conform to *AASHTO M 288*, Table 2 (> 50% of in situ soil passing the No. 200 (0.075 mm) sieve) for Subsurface Drainage Geotextile Requirements. Geotextile structure shall be nonwoven and shall not be slit film.

720.06 GEOTEXTILE FOR FILTER CURTAIN. Minimum Average Roll Values (MARV) for Geotextile for Filter Curtain shall be as required in Table 720.06A.

TABLE 720.06A – MARV FOR GEOTEXTILE FOR FILTER CURTAIN

Geotextile Property	Test Method	MARV
Elongation Criteria at Failure [1]	*ASTM D 4632/ D4632 M*	20% max.
Grab Strength (lbs)	*ASTM D 4632/ D4632 M*	200
Tear Strength (lbs)	*ASTM D 4533/ D 4533 M*	50
Puncture Strength (lbs)	*ASTM D 6241*	430
Permittivity (s^{-1})	*ASTM D 4491/ D 4491 M*	0.28
Apparent Opening Size (mm)	*ASTM D 4751*	0.212 max. (No. 70 Sieve)
UV Resistance (% Strength Retained)	*ASTM D 4355/ D 4355 M*	70% at 500 hours of exposure
Structure	--	Woven only

[1] Elongation corresponds to Maximum Grab Tensile Strength as measured in accordance with the requirements of *ASTM D 4632/D 4632 M*.

720.07 GEOTEXTILE FOR SILT FENCE. Geotextile for Silt Fence shall conform to *AASHTO M 288*, Table 8 for Temporary Silt Fence Property Requirements. Geotextile structure shall be woven.

SECTION 725 – CONCRETE CURING MATERIALS AND ADMIXTURES

725.01 CONCRETE CURING MATERIALS, part (d) is hereby modified by being deleted in its entirety and replaced with the following:

(d) Liquid Membrane-Forming Compounds. Liquid membrane-forming compounds shall be one of the products listed on the Agency's *Approved Products List* and shall meet the following requirements:

(1) Liquid membrane-forming compounds shall be evaluated in accordance with the NTPEP concrete curing compounds work plan.

(2) Liquid membrane-forming compounds shall conform to the requirements of *ASTM C 309*, Type 1-D or Type 2, Class B.

(3) Liquid membrane-forming compounds shall not be allowed to freeze.

725.02 CHEMICAL ADMIXTURES, part (a) is hereby modified by being deleted in its entirety and replaced with the following:

(a) General Requirements. Non-bulk quantities of chemical admixtures shall be delivered in the manufacturer's original containers marked with the manufacturer's name and product name. Bulk quantities shall be accompanied by a delivery slip indicating both the manufacturer's name and the product name. Chemical admixtures shall be one of the products listed on the Agency's *Approved Products List* for the respective material specification, shall be evaluated in accordance with the NTPEP concrete admixtures work plan, and shall meet the requirements of the respective material specification below.

SECTION 726 – PROTECTIVE COATINGS AND WATERPROOFING MATERIALS

726.09 METALIZING is hereby modified by being deleted in its entirety and replaced with the following:

726.09 METALIZING. Surfaces to be metalized shall be prepared and coated in accordance with the requirements of *AASHTO/NSBA S8.2/SSPC-PA 18, Specification for Application of Thermal Spray Coating Systems to Steel Bridges*, and the following:

(a) The coating shall be zinc with a minimum purity of 99.9%.

(b) All surfaces to be thermal sprayed shall be blast-cleaned to white metal immediately prior to metalizing. The final surface appearance shall be equivalent to Preparation Grade *SSPC-SP 5* supplemented by *SSPC VIS-1*. All surfaces shall also have a uniform surface profile of 3.5 to 5.5 mils. If the profile requirements of the coating manufacturer are more restrictive, the Fabricator shall advise the Structural Steel Fabrication Engineer and comply with the more restrictive requirements.

The surface profile produced by the Fabricator's surface preparation procedures shall be determined by replica tape and spring micrometer at the beginning of the work, and each day that the surface preparation is performed. The replica tape shall be attached to the daily inspection records. Areas having unacceptable measurements shall be further tested to determine the limits of the deficient area and subsequently corrected to meet specification requirements.

(c) Thermal Spray Coating (TSC) shall be applied within six hours of completing blast cleaning. If this time is exceeded, or rust appears on the surface, the steel surface shall be properly prepared again. TSC shall be applied in the thickness range of 8 to 12 mils to all exterior surfaces. Internal surface (e.g. pot bearings) shall have a coating with a minimum thickness of 2 mils.

(d) Exterior surfaces (except faying surfaces) shall be sealed with an approved sealant conforming to the sealant manufacturer's recommendations for the TSC applied. The sealant name, manufacturer, and product data sheets shall be included with the submittal for the metalizing procedure. Unless otherwise specified in the Contract, a top coat will not be applied over the seal coat, and therefore the seal coat shall be UV-resistant. The dry film thickness of the sealant shall be 1 to 2 mils. The sealant shall be applied within 8 hours of completing the TSC application.

(e) In addition to the requirements above, the following shall also apply:

(1) QA witnessing of Job Reference Standard(s) is required, when applicable

(2) Companion coupons shall be used in lieu of destructive testing on the work piece, except when a test failure occurs.

(3) Bend tests shall be performed. The tests shall meet the requirements of *AWS C2.23*.

(f) Metalizing that has been damaged shall be repaired in accordance with the requirements of Subsection 726.08.

726.11 WATERPROOFING MEMBRANE SYSTEMS is hereby modified by being deleted in its entirety and replaced with the following:

726.11 WATERPROOFING MEMBRANE SYSTEMS. Waterproofing Membrane Systems shall conform the requirements of *ASTM D 6153*, be one of the products listed on the Agency's *Approved Products List*, and meet the following requirements for the respective material specification.

(a) Waterproofing Membrane System, Type I. Waterproofing Membrane System, Type I shall be a Type I cold applied elastomeric system in accordance with *ASTM D 6153*.

(b) Waterproofing Membrane System, Type II. Waterproofing Membrane System, Type II shall be a Type II hot applied elastomeric system in accordance with *ASTM D 6153*.

(c) Waterproofing Membrane System, Type III. Waterproofing Membrane System, Type III shall be a Type III preformed sheet membrane system in accordance with *ASTM D 6153*.

SECTION 753 – HIGHWAY ILLUMINATION

753.04 BRACKET ARMS is hereby modified by being deleted in its entirety and replaced with the following:

753.04 BRACKET ARMS.

(a) Bracket Arms, Aluminum. Single member bracket arms and the main member of truss-type arms shall be fabricated from seamless aluminum tube conforming to the requirements of *ASTM B 221/B 221 M,* Alloy 6063-T6 or Alloy 6061-T6. Other members of truss-type arms shall conform to the requirements of *ASTM B 221/B 221 M,* Alloy 6063-T6. All screws, nuts, bolts and other hardware for mounting bracket arms to the light pole shall be stainless steel, unless otherwise specified.

(b) Bracket Arms, Steel. Components of single member and truss-type bracket arms shall be fabricated from standard steel pipe meeting the requirements of *ASTM A 53/A 53 M* or *ASTM A 501/A 501 M*.

SECTION 754 – PAVEMENT MARKING MATERIALS

SECTION 754 – PAVEMENT MARKING MATERIALS is hereby made a new Section of the Specifications as follows:

SECTION 754 – PAVEMENT MARKING MATERIALS

754.01 THIS SUBSECTION RESERVED.

754.02 THIS SUBSECTION RESERVED.

754.03 PAVEMENT MARKING TAPE. Pavement marking tape is a white or yellow preformed retroreflective tape. Pavement marking tape shall be evaluated in accordance with the applicable NTPEP pavement marking materials work plan, with a minimum of one year of data for permanent tape and a full data set for temporary tape, listed on the Agency's *Approved Product List* for the respective material specification, and meet the following requirements.

(a) Pavement Marking Tape, Type A. Pavement Marking Tape, Type A shall be a high performance and extended service life pavement marking tape in accordance with *ASTM D 4505*. The tape shall have continuous wetting properties and meet the following requirements.

(1) Skid Resistance. Skid resistance shall be Skid Resistance Level A in accordance with *ASTM D 4505*.

(2) Adhesive. Adhesive shall be Class I, II, or III in accordance with *ASTM D 4505*.

(3) Durability. Initial durability shall be 10 and three-year durability shall be a minimum of 7 as determined in accordance with *ASTM D 913*.

(4) Retroreflectivity.

a. Dry. Initial dry retroreflectivity shall be Reflectivity Level I in accordance with *ASTM D4505*. Three-year retroreflectivity shall be a minimum of 150 mcd/m^2/lx for white and 100 mcd/m^2/lx for yellow as determined in accordance with *ASTM E 1710*.

b. Wet. Initial wet retroreflectivity shall be a minimum of 250 mcd/m^2/lx for white and 200 mcd/m^2/lx for yellow. Three-year wetness retroreflectivity shall be a minimum of 150 mcd/m^2/lx for white and 75 mcd/m^2/lx for yellow as determined in accordance with *ASTM E 2177*.

c. Wet Continuous. Wet continuous retroreflectivity shall be a minimum of 150 mcd/m^2/lx for white and 100 mcd/m^2/lx for yellow in accordance with *ASTM E 2832*.

(b) Pavement Marking Tape, Type B. Pavement Marking Tape, Type B shall be a standard performance pavement marking tape in accordance with *ASTM D 4505*.

(1) Skid Resistance. Skid resistance shall be Skid Resistance Level A in accordance with *ASTM D4505*.

(2) Adhesive. Adhesive shall be Class I, II, or III in accordance with *ASTM D 4505*.

(3) Durability. Initial durability shall be 10 and three-year durability shall be a minimum of 7 as determined in accordance with *ASTM D 913*.

(4) Retroreflectivity. Initial dry retroreflectivity shall be Level II in accordance with *ASTM D 4505*.

(c) Pavement Marking Tape, Type C. Pavement Marking Tape, Type C shall be a temporary pavement marking tape in accordance with *ASTM D 4592* and the following requirements.

(1) Retroreflectivity. Initial wet retroreflectivity shall be a minimum of 250 mcd/m^2/lx for white and 200 mcd/m^2/lx for yellow.

ALPHABETICAL INDEX OF PAY ITEMS

The index entry "406.38 Hand-Placed Bituminous Concrete Pavement, Drives..... Square Yard" is hereby modified by deleting the word "Pavement" and replacing it with the word "Material".

The index is hereby modified by adding an entry for "418.10 Asphaltic Approach Material..... Square Foot".

The index entry for "646.75 Raised Pavement Markers, Type II..... Each" is hereby modified by being deleted in its entirety.