

State of Connecticut

Department of Transportation

SUPPLEMENTAL SPECIFICATIONS

TO

THE STANDARD SPECIFICATIONS

FOR

ROADS, BRIDGES, FACILITIES

AND INCIDENTAL CONSTRUCTION

FORM 817

2016

JANUARY 2019

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<u>Section or Article</u>	<u>Book Page #</u>	<u>Please make the following Corrections:</u>	<u>Rev. Date</u>
Division I GENERAL REQUIREMENTS AND COVENANTS			
TOC	i	<i>in the title of 2.04, add "Cofferdam Material Left in Place"</i>	July18
TOC	ii	<i>change the title of 5.03 to "Removal of Superstructure"</i>	July17
TOC	iii	<i>1. change the title of 8.03 to "Paved Ditches, Paved Aprons and Paved Channels" 2. delete "8.16, Granite Slope Curbing"</i>	Jan17
TOC	iii	<i>1. delete "9.08, Farm Wall Fence" 2. delete "9.25, Pavement for Railing"</i>	July17
TOC	v	<i>delete "12.16, Black Epoxy Resin Pavement Markings, Black Epoxy Resin Symbols and Legends"</i>	Jan17
TOC	v	<i>1. delete "18.00, General Clauses - Impact Attenuation Systems" 2. change the title of 18.02 Type A - Impact Attenuation System to "Sand Barrels" 3. add "18.03, Impact Attenuation System, Temporary Impact Attenuation System"</i>	Jan18
TOC	v	<i>change the title of "18.06 Type D Portable Impact Attenuation System" to "Truck-Mounted or Trailer-Mounted Impact Attenuator"</i>	July17
TOC	v	<i>change the title of M.01 Gradation of Aggregate, to "Aggregates"</i>	Jan17
1.03.07	17	<i>in the title of subarticle 1, change "Worker's" to "Workers"</i>	Jan19
1.05.02	27	<i>in Subarticle 2a(i), change "Form" to "form" and delete "Number CON-500,"</i>	Jan17
1.05.08	36	<i>change font to bold for paragraph titles "Biweekly Schedules" and "Recovery Schedules"</i>	Jan17
1.05.10	37	<i>correct typographical error in the second sentence of the third paragraph "until"</i>	July17
1.05.13	39	<i>in the first sentence of the third paragraph, delete "(CON-13),"</i>	Jan17
1.05.15	40	<i>correct typographical error in the second paragraph "locater"</i>	July17
1.07.08	51	<i>change the first sentence of the third paragraph to be two sentences, as follows: "The Contractor shall notify each utility... ..intention to use explosives. Such notice shall be given sufficiently..."</i>	July17
1.09.02	68	<i>under Payment for accepted VECPs correct typographical error "payment"</i>	July17
1.10.02	75	<i>correct typographical error in the first sentence of the fourth paragraph "activity"</i>	July17
Division I GENERAL REQUIREMENTS AND COVENANTS, GENERAL CLAUSES FOR FACILITIES CONSTRUCTION			
1.20-1.03.07	105	<i>in the title of subarticle 1, change "Worker's" to "Workers"</i>	Jan19
1.20-1.05.10	132	<i>correct typographical error in the second sentence "location"</i>	July17
1.20-1.05.15	136	<i>correct typographical error in the second paragraph "locater"</i>	July17
1.20-1.08.12	176	<i>correct typographical error in subarticle 3.(3) "warranty"</i>	July17
1.20-1.09.01	180	<i>in the first sentence of the first paragraph, delete "(System International)"</i>	Jan17
1.20-1.10.03	193	<i>correct typographical errors: 1. in the third sentence of subarticle 2, "from" 2. in the second sentence of subarticle 4, "Site" 3. in the first sentence of subarticle 9, "within"</i>	July17

Section or Article	Book Page #	Please make the following Corrections:	Rev. Date
1.20-1.10.03	194	<p>correct typographical errors:</p> <ol style="list-style-type: none"> in the fifth sentence of subarticle 9, "and" in the first sentence of subarticle 11, "pollution" in the third sentence of subarticle 12, "might" 	July17
1.20-9.75.04	203	in the last sentence of the last paragraph, delete the "t" after "100%"	Jan17
Division II CONSTRUCTION DETAILS			
2.19.03	250	<ol style="list-style-type: none"> in the sentence that begins "All geotextile fences shall..." delete the word "have" change the only sentence of the last paragraph as follows: "The sedimentation control systems shall be maintained purpose intended or are ordered removed from the Site at the completion authorized by the Engineer to be left in place." 	Jan17
4.01.05	266	in the first sentence of the second paragraph under 1. Concrete replace "in-situ testing" with "in-place testing"	July18
4.06.01	268	in the third sentence replace "ConnDOT" with "CTDOT"	July17
4.06.03	277	in Figure 4.06-1: Notched Wedge Joint change dimensions of the Bottom Vertical Notch to "1/4"-1/2"	July17
4.06.03	282	in Figure 4.06.05: Notched Wedge Joint Cores delete the dimensions under Bottom Vertical Notch and Top Vertical Notch, remove the arrow and delete the dimension "12" Taper" under the figure	July17
4.06.03	283	<p>correct the following references:</p> <ol style="list-style-type: none"> in the third sentence of subarticle 12, change "4.06.03-9" to "4.06.03-8" in the third sentence of the second paragraph of subarticle 12, change "4.06.03" to "4.06.03-10" 	July17
4.06.04	285	under "Percent Adjustment for Air Voids," change the last sentence as follows: "n = number of sub lots based on Table M.04.03-2"	Jan17
4.15.05	289	revise the end of the last sentence as follows: "...additional subbase, compaction of subbase and compaction testing, but the cost thereof shall be included in the cost of the pressure relief joint."	July18
5.14.03	309	in subarticle 7 Curing change AASHTO reference to "AASHTO LRFD Bridge Construction Specifications"	July18
5.14.03	310	<p>in subarticle 10 Quality Control add a paragraph return before the last sentence as follows:</p> <p>"... of the member. ¶ Deviations in excess of the permissible tolerances will be cause for rejection." (to separate it from item 2 as the sentence refers to both items 1 and 2, not just item 2)</p>	Jan17
6.01.03	316	delete subarticle 6.01.03-1(e) "Date of Completion" (make vacant)	July17
6.02.03	336	<p>in subarticle 4.(b) Support Systems, insert a paragraph return at the end of the second sentence as follows: "...and the surface of the concrete. ¶ The reinforcing steel cover shall be no less than that shown on the plans and no greater than that shown plus 1/4 inch."</p>	Jan19
6.52.02	367	in the only sentence, replace the words "Gravel Fill" with "Granular Fill"	Jan17
6.52.03	368	in both paragraphs, replace the words "gravel fill" with "granular fill"	Jan17

<u>Section or Article</u>	<u>Book Page #</u>	<u>Please make the following Corrections:</u>	<u>Rev. Date</u>
6.52.04	368	<i>in the only sentence of the third paragraph, replace the words "Gravel Fill" with "Granular Fill"</i>	Jan17
6.52.05	368	<i>in the only sentence of the third paragraph, replace the words "Gravel Fill" with "Granular Fill"</i>	Jan17
7.01.02	370	<i>change the only sentence in subarticle 1.(d) as follows: "Coarse aggregate shall meet the gradation requirements specified in Table M.01.02-2 for No. 8 coarse aggregate."</i>	Jan & July17
7.06.02	404	<i>in the second sentence of Subarticle 5, delete the word "with"</i>	Jan17
7.06.03	413	<i>in the fourth column of Table 7.06-1, Cyclic Load Schedule for Verification Pile Load Test, delete the word "minutes" next to the entries for "Step 2, Cycle 1, 0.6 SVL" and "Step 3, Cycle 2, 0.750 UPC" to show the "Hold Time (minutes)" entries of "2.5" corresponding to the subsequent fractions of the "Applied Load" in the table</i>	Jan17
7.14.04	420	<i>change the last sentence of the article as follows: "Sheet piling left in place solely at the Contractor's option, with the Engineer's permission, will not be measured for payment."</i>	Jan17
7.16.02	421	<i>in the last sentence in the Article, change "material certificates" to "Materials Certificates"</i>	Jan17
7.17.02	422	<i>replace "7.17.02—Materials: (Vacant)" with the following: "7.17.02—Materials: The materials shall be as specified in 7.16.02."</i>	Jan19
7.28.02	423	<i>change the only sentence as follows: "The crushed stone shall meet the requirements of Table M.01.02-2 for No. 3 coarse aggregate."</i>	Jan17
9.04.03	438	<i>in the only sentence of the fifth paragraph, change "FSS-TT-C598" to "FS-TT-C598"</i>	July17
9.12.05	446-447	<i>1. in subarticle 4. Remove Cable Guiderail and Remove Metal Beam Rail delete "(Type)" 2. in the Pay Item - Pay Unit table, for the items Remove Cable Guide Rail and Remove Metal Beam Rail, delete "(Type)"</i>	Jan18
9.43.04, 9.43.05	462	<i>in the first sentence of each article, replace the word "million" with "m."</i>	Jan17
9.47.02	464	<i>in the last sentence of subarticle 4, change "ASTM A153" to "ASTM F2329"</i>	Jan18
9.49.03	470	<i>in the only sentence of subarticle 13. Mulching, replace "4 in." with "3 inches"</i>	Jan19
9.50.03	472-473	<i>1. in subarticle 2. Seeding Season change the Fall ending date to "October 31" 2. in the first sentence of subarticle 5, change "100 plants" to "60% coverage"</i>	Jan17
9.50.05	473	<i>1. in the only sentence of the second paragraph, insert the word "(Type)" after "Erosion Control Matting" 2. in the Pay Item – Pay Unit table, insert the word "(Type)" after "Erosion Control Matting"</i>	Jan17
9.77.02	485	<i>change the end of the last sentence of the Article to read "... or the AASHTO Manual for Assessing Safety Hardware (MASH) for Category 1 Devices"</i>	Jan17
9.81.01-9.81.02	490-491	<i>throughout both articles, correct typographical errors: "retroreflective"</i>	July17
10.00.14	501	<i>throughout the article, replace "ConnDOT" with "CTDOT"</i>	July17

<u>Section or Article</u>	<u>Book Page #</u>	<u>Please make the following Corrections:</u>	<u>Rev. Date</u>
10.01.01	503	after the first paragraph, insert the following paragraph: "Rock, insofar as it applies to trenching and backfilling, shall be defined as rock in definite ledge formation, boulders, or portions of boulders, cement masonry structures, concrete structures, reinforced concrete pipe, Portland cement concrete pavement or base, of 1/2 c.y. or more in volume, removed as indicated or directed from within the payment lines for trenching and backfilling."	Jan18
10.01.04- 10.01.05	504	1. in the first sentence of 10.01.04, replace "Article 2.05.01" with "10.01.01" 2. in the first sentence of the third paragraph of 10.01.05, replace "Article 2.05.01" with "10.01.01"	Jan18
10.02.02	505	in the second line, replace the words "Gravel Fill" with "Granular Fill"	Jan17
10.10.02	511	1. in the article referenced for "No. 6 Crushed Aggregate," change "M.01.01" to "M.01.02" 2. in the only sentence of the second paragraph, replace "lb./in ² " with "psi" 3. in the last sentence of the Article, close the quotation marks as follows: "TRAFFIC."	Jan17
10.10.03	511	in the second sentence of the second paragraph of the Article, close the parentheses as follows: "...4 inches)"	Jan17
12.01.02	535	change the only sentence as follows: "Materials for this work shall meet the requirements of M.03.05, M.06.02, M.18.02 and the Contract."	Jan17
12.09.02	544	change the end of the only sentence of the article to read "... M.07.30 for glass beads, Type 1 (smaller beads)."	Jan17
12.09.03	544	in the only sentence of the second paragraph of the article, insert "Type 1 (smaller beads)" after the phrase "... with glass beads"	Jan17
Division III MATERIALS SECTION			
M.03.01	574	1. replace entire subarticle 1. Coarse Aggregate with the following: "Coarse aggregate shall conform to the requirements of M.01." 2. replace entire subarticle 2. Fine Aggregate with the following "Fine aggregate shall conform to the requirements of M.01."	Jan17
M.03.01	576	in subarticle 4. Water replace references to "AASHTO T 26 and AASHTO D 512" with "ASTM C1602 and ASTM D512"	Jan19
M.03.02	577	in the title of subarticle 2. change "ConnDOT" to "CTDOT"	July17
M.03.02	577	in the fifth column of Table M.03.02-1 change the heading to read "Maximum Aggregate Size Required (Table M.01.02-2)"	Jan17
M.03.08	581	1. in subarticle 5. Joint Sealant a. in subarticle (a) Joint Sealer for Pavement , change "AASHTO M 324 Type II" to "ASTM D6690 Type II" b. in subarticle (b) Joint Sealer for Structures , replace the first two sentences of subarticle 1 with the following: "1. Where "Joint Seal" is specified on the plans, it shall meet the requirements of ASTM C920 Type S (single component), Grade P (Self-leveling type) or Grade NS (Non-sag type), Class 50 or other approved single component sealant. A Certified Test Report will be required in accordance with 1.06.07, certifying that the sealant meets the requirements of ASTM C920." 2. in the first sentence of subarticle 6. Closed Cell Elastomer , change "ASTM D1056, Grade RE-41 B2" to "ASTM D1056, Grade Number 2B2"	July 18

<u>Section or Article</u>	<u>Book Page #</u>	<u>Please make the following Corrections:</u>	<u>Rev. Date</u>
M.04.01	583	<i>in the first sentence of the second paragraph under (b) <u>Basis of Approval</u> change “#4 sieve” to “No. 4 sieve”</i>	Jan17
M.04.01	586	<ol style="list-style-type: none"> <i>correct typographical error in the second sentence of subarticle 4. Performance Graded Asphalt Binder, (c) <u>Modified Performance Grade (PG) Binder</u>, “homogeneous” in subarticle 4. Performance Graded Asphalt Binder,</i> <i>in (b) <u>Neat Performance Grade (PG) Binder</u>, i., at the end of the second sentence, capitalize “Certified Test Report”</i> <i>in (d) <u>Warm Mix Additive Technology</u>, i., change “NEAUPG” to “North East Asphalt User Producer Group (NEAUPG)”</i> 	July17 & Jan17
M.04.01	588	<i>in subarticle 6. Reclaimed Asphalt Pavement (RAP), (b) <u>Basis Approval</u>,</i> <ol style="list-style-type: none"> <i>in paragraph i, capitalize “Materials Certificate”</i> <i>in the second sentence in paragraph ii, change “material certificate” to “Materials Certificate”</i> 	Jan17
M.04.02	593	<i>in the third bullet under 2. Superpave Design Method - S0.25, S0.375, S0.5 and S1: (a) Requirements, ii <u>Superpave Mixtures with RAP</u>, insert the word “with” between “in accordance” and “AASHTO T 308”</i>	Jan17
M.04.02	594	<i>in Subarticle 2. Superpave Design Method - S0.25, S0.375, S0.5 and S1, (a) Requirements</i> <ol style="list-style-type: none"> <i>in the third sentence of the third bullet in iii <u>Superpave Mixtures with RAS</u>, insert the word “with” between “in accordance” and “AASHTO,” and capitalize “Appendix”</i> <i>in the first sentence in iv <u>Superpave Mixtures with CRCG</u>, capitalize “Materials Certificate”</i> 	Jan17
M.05.01	611	<i>in subarticle 1:</i> <ol style="list-style-type: none"> <i>add the heading “Table M.05.01-1” to the only table in the article</i> <i>correct the following typographical error: in the first row under “Square Mesh Sieves” in Table M.05.01-1, change “Pass 1 1/2 inches” to “Pass 2 1/2 inches”</i> 	Jan17
M.05.02	612	<i>add the heading “Table M.05.02-1” to the only table in the article</i>	Jan17
M.06.01	614	<i>delete the last paragraph in subarticle 1. Bar Reinforcement, “Prior to incorporation... ..type of bar reinforcement.”</i>	July18
M.06.01	615	<ol style="list-style-type: none"> <i>in subarticle 3. Wire and Welded Steel Wire Fabric,</i> <ol style="list-style-type: none"> <i>in the first sentence, change “ASTM A82” to “ASTM A1064”</i> <i>in the second sentence, change “ASTM A185” to “ASTM A1064”</i> <i>in subarticle 6. Deformed Steel Wire and Welded Deformed Steel Wire Fabric,</i> <ol style="list-style-type: none"> <i>in the first sentence, change “(ASTM A496)” to “(ASTM A1064)”</i> <i>in the second sentence, change “(ASTM A497)” to“(ASTM A1064)”</i> 	July18
M.08.01	630	<i>in the second sentence of subarticle 6. Metal Culvert End, change “ASTM A 153” to “ASTM F2329”</i>	Jan18
M.08.01	632	<i>in the second sentence of subarticle M.08.01-7(g) Certification, change “MAT 073 (PC-1)” to “MAT 314 (PC-1)”</i>	July17
M.08.01	632	<i>delete the only sentence in the second paragraph of subarticle 10. Slotted Drain Pipe, “Elastomeric polymer sealer... ..on manufacturer's certification.”</i>	July18
M.08.02	636	<i>revise the only sentence in subarticle 5. Metal for Drainage Structures, Cast Iron, to read as follows: “Cast Iron shall conform to the requirements of AASHTO M 105, Class 35B for the frames and grates.”</i>	Jan18

<u>Section or Article</u>	<u>Book Page #</u>	<u>Please make the following Corrections:</u>	<u>Rev. Date</u>
M.08.03	636	1. in the last sentence of subarticle 1. Bedding Material , change "Article M.01.01" to " M.01.02 " 2. change the last sentence under subarticle 2. Aggregates for Underdrain as follows: " Broken Stone or Screened Gravel : The crushed stone shall meet the gradation requirements of Table M.01.02-2 for Size No. 8 coarse aggregate ."	Jan17
M.12.04	654	in the second sentence in M.12.04-1. Waterproofing Asphalt , correct typographical error: "mrrt" should be " meet "	Jan17
M.15.02	674	1. in the last sentence of subarticle 1. Light Standard Base , replace "ASTM A153" with " ASTM F2329 " 2. in the last sentence of subarticle 2. Pedestal and Controller Foundation , replace "ASTM A153" with " ASTM F2329 "	Jan18
M15.02	675	in subarticle 3. Span Pole and Mast Arm Foundations , change the last sentence of the third paragraph to the following: "The threads, nuts and washers shall be hot-dip galvanized in accordance with the requirements of ASTM F2329 ."	Jan18
M.15.04	675	in the last sentence of subarticle (a) General replace "of 90 mph" with " as recommended in AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals." "	Jan18
M.16.04	685	in the second sentence in subarticle 1. Steel Poles, (m) Fabrication , change "materials certificates" to " Materials Certificates "	Jan17
M.16.04	685	change the second sentence of subarticle 1. Steel Poles, (n) Finish as follows: "Pole cap, bolt covers, handhole and covers span clamps shall be galvanized as per ASTM A153 . Bolts, screws, washers, nuts and wire entrance fittings shall be galvanized as per ASTM F2329 ."	Jan18
M.16.05	688	change the second sentence of subarticle 2. Steel, (d) Finish as follows: "Pole Cap, bolt covers handhole covers shall be galvanized to meet the requirements of ASTM A153 . Bolts, washers, nuts and screws shall be galvanized, meeting the requirements of ASTM F2329 ."	Jan18
M.16.05	688	in the second sentence in subarticle 2.(e) Fabrication , change "materials certificates" to " Materials Certificates "	Jan17
M.17.01	710	in the last sentence of subarticle 2.(a) change "USASI" to " ANSI "	July17
M.17.01	712	in the last sentence of subarticle (c) under 4. Adhesive Bonding , change "Material Certificates" to " Materials Certificates "	Jan17
LIST OF STANDARD PAY ITEMS, ENGLISH/METRIC CONVERSION CHARTS, INDEX			
N/A	727	in the LIST OF STANDARD PAY ITEMS , add " 2.04, Cofferdam Material Left in Place, I.f. "	July18
N/A	728	in the LIST OF STANDARD PAY ITEMS , delete "5.03, Maintaining Existing Bridge, I.s."	July17
N/A	730	in the LIST OF STANDARD PAY ITEMS , 1. add " 8.03, Paved Apron, s.y. " 2. delete "8.16, Granite Slope Curbing (Size), I.f." and "8.16, Curved Granite Slope Curbing (Size), I.f." 4. delete "9.08, Farm Wall Fence, I.f." 5. change "9.10, Metal Beam Rail R-B 350 (Type I, II or III), ea." to "9.10, Metal Beam Rail Span Section (Type II or III), ea." 6. change "9.10, Convert Metal Beam Rail (Type) to Metal Beam Rail (Type), I.f." to "9.10, Convert Metal Beam Rail (Type) to (Type), I.f."	Jan17 & July17

<u>Section or Article</u>	<u>Book Page #</u>	<u>Please make the following Corrections:</u>	<u>Rev. Date</u>
N/A	731	<p><i>in the LIST OF STANDARD PAY ITEMS,</i></p> <ol style="list-style-type: none"> 1. <i>for the items in Section 9.12, Remove Cable Guide Rail and Remove Metal Beam Rail, delete "(Type)"</i> 2. <i>add "9.13, Remove Chain Link Fence, l.f."</i> 2. <i>delete "9.25, Pavement for Railing, s.y."</i> 	<p>Jan18, Jan19 & July17</p>
N/A	733	<p><i>in the LIST OF STANDARD PAY ITEMS,</i></p> <ol style="list-style-type: none"> 1. <i>delete "11.31, Changeable Message Sign, day"</i> 2. <i>replace "11.31, Remote Controlled Changeable Message Sign, day" with "11.31, Remote Control Changeable Message Sign, day"</i> 3. <i>delete "12.16, (Width) Black Epoxy Resin Pavement Markings, l.f." and delete "12.16, Black Epoxy Resin Symbols and Legends, s.f."</i> 4. <i>replace "18.02, Type A Impact Attenuation Module (Weight), ea." with "18.02, Permanent Sand Barrel (Weight), ea."</i> 5. <i>add "18.02, Temporary Sand Barrel (Weight), ea." and "18.02, Relocation of Temporary Sand Barrel (Weight), ea."</i> 6. <i>add "18.03, Impact Attenuation System (Type), ea.," "18.03, Temporary Impact Attenuation System (Type), ea." and "18.03, Repair of Impact Attenuation System (Type), est."</i> 7. <i>replace "18.06, Type D Portable Impact Attenuation System, hr." with "18.06, Truck-Mounted or Trailer-Mounted Impact Attenuation System, hr."</i> 8. <i>delete "18.07, Temporary Impact Attenuation System Type A Module (Weight), ea.," "18.07, Temporary Impact Attenuation System (Type), ea.," "18.07, Relocation of Temporary Type A Impact Attenuation Module, ea.," "18.07, Relocation of Temporary Impact Attenuation System (Type), ea." and "18.07, Repair of Temporary Impact Attenuation System, est."</i> 	<p>Jan18, Jan17 & July17</p>

**SECTION 1.01
 DEFINITION OF TERMS AND
 PERMISSIBLE ABBREVIATIONS**

Replace Section 1.01 in its entirety with the following:

**SECTION 1.01
 DEFINITION OF TERMS AND
 PERMISSIBLE ABBREVIATIONS**

1.01.01—Definitions

1.01.02—Abbreviations, Publications and Standards

1.01.03—Abbreviations and Terms

1.01.01—Definitions: In these specifications, unless the context requires otherwise, words of the masculine gender include the feminine and the neuter, and, when the sense so indicates, words of the neuter gender may refer to any gender. Where appropriate, words in the singular form shall be deemed to include the plural, and words in the plural form to include the singular.

ADDENDUM: Contract revisions developed and incorporated into the contract after bid advertisement and before the opening of bid proposals.

AIR OPERATIONS AREA: Any paved or unpaved area of the airport used or intended to be used for the unobstructed movement of aircraft. These movements shall include landings, takeoffs, and surface maneuverings.

AWARD: The Department's acceptance in writing of the proposal of the lowest responsible bidder for the work, subject to the execution and approval by the Department of a contract therefor and the provision by the bidder of performance and payment bonds to secure the performance thereof which are acceptable to the Commissioner, and to such other conditions as may be specified by the Department or required by law.

BID: The submission of a proposal for the work contemplated.

BID ADVERTISEMENT: A public announcement soliciting bids for a contract for work to be performed or materials to be furnished.

BID MANUAL: "The State of Connecticut Department of Transportation Construction Contract Bidding and Award Manual," copies of which are available from the Department's Division of Contracts and at the following link: [Construction Contract Bidding and Award Manual](#)

BIDDER: Any individual, firm, partnership, corporation, or combination thereof, submitting a proposal for the work contemplated, acting directly or through a duly authorized representative

CALENDAR DAY: Every day shown on the calendar, Sundays and holidays included.

CATALOG CUT (PRODUCT DATA): Document(s) with information such as manufacturer's product specifications, manufacturer's installation instructions, standard color charts, wiring diagrams showing factory-installed wiring, printed performance curves and operational range diagrams. Product data that must be specially prepared because standard printed data is not suitable shall be considered shop drawings.

CERTIFICATE OF COMPLIANCE: The formal document issued at the completion of a project by the State Building Inspector's representative. The document is often referred to informally as a "Certificate of Occupancy," "C.O.C." or "C.O."

CHANNEL: A channel shall be interpreted to mean a natural or artificial watercourse having an average width at the bottom, after excavation, of 4 feet or more.

COMMISSIONER: State of Connecticut Transportation Commissioner acting directly or through a duly-authorized representative.

CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL: This [Department of Energy and Environmental Protection \(DEEP\) Bulletin](#) is intended to provide information to government agencies and the public on soil erosion and sediment control.

CONNECTICUT STORMWATER QUALITY MANUAL: This [DEEP publication](#) provides guidance on measures necessary to protect waters of the State from adverse impacts of post-construction stormwater runoff.

CONSTRUCTION ORDER, CHANGE ORDER: A written order signed by the Engineer for a contractor to perform work or provide supplies stipulated therein at the price or upon the basis of payment set forth therein.

CONTRACT: The agreement covering the performance of the work and the furnishing of materials required for the construction of the Project. The Contract shall be deemed to include the "Plans," "Specifications" (*i.e.*, the Department's "Standard Specifications for Roads, Bridges, Facilities and Incidental Construction" which is in effect on the date of the Bid Advertisement), "Construction Orders," and such other provisions as may be incorporated into the agreement, in addition to the contents of the bound contract containing the schedule of prices, signature sheet, addenda, special provisions, required federal and state provisions, supplemental specifications, labor and wage schedules, permits and other such material.

CONTRACTOR: When the word is capitalized, the party of the second part to the Contract, acting directly or through its agents or employees. When this word is not capitalized, it is to be taken in its more general sense.

CULVERT: A covered channel or a large pipe for carrying a watercourse below ground level, usually under a road or railway.

DEPARTMENT: State of Connecticut Department of Transportation.

DESIGNER: A duly-authorized representative of the Engineer, responsible for the design of the Project.

DRAINAGE DITCH: A paved or unpaved, artificially-constructed open depression having an average width of less than 4 feet at the bottom, after excavation, constructed for the purpose of carrying off surface water.

ENGINEER: The Commissioner or Deputy Transportation Commissioner, acting directly or through a duly-authorized representative.

EXECUTION OF CONTRACT: The date of execution of the Contract by the Department is the date on which the Department's authorized signatory signs the Contract on behalf of the Department.

EQUAL: A material, device, type of equipment, or method other than what is specified in the Contract, which is a recognized equivalent in substance and function for that specified thing, taking into account quality, workmanship, economy of operation, durability, and suitability for purposes intended, provided that the proposed equivalent would not require or constitute a change in Contract work.

HIGHWAY: A general term denoting a public way used for vehicular travel. When referred to in the Contract, it signifies the whole right of way reserved for or secured by the Department for use in constructing or maintaining a roadway and its appurtenances.

INSPECTOR: A duly-authorized representative of the Engineer, assigned to make inspections of the work performed and materials furnished by the Contractor.

LABORATORY: Unless another laboratory or type of laboratory is indicated, the official testing laboratory of the Department.

LIQUIDATED DAMAGES: The amount prescribed in the Contract specifications, to be paid to the State or to be deducted from any payments due or to become due the Contractor, for a specified time unit delay in completing the whole or any specified portion of the work beyond the time allowed in the Contract.

MAJOR ITEM: An individual Contract item, whose value at the time of bidding (either lump sum price or the product of its unit price multiplied by its estimated quantity) is equal to or greater than 10% of the total original Contract bid price shall be considered a Major Item.

MANAGER OF CONTRACTS: The Transportation Manager of Contracts, who is the head of the Department's Division of Contracts, and whose office is located at the headquarters of the Department at 2800 Berlin Turnpike, Newington, CT.

MATERIAL: Any substance specified in the Contract for use in the construction of the Project, including appurtenances of products that are substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the work.

MINOR ITEM: An individual Contract item that is not a Major Item.

MUNICIPALITY: City, town or county.

NOTICE TO PROCEED: A written notice issued by the Engineer to the Contractor stating the date on which the Contractor is authorized to commence and proceed with the Contract work.

PAVEMENT STRUCTURE: The combination of sub-base, base course and surface course placed on subgrade to support and distribute the traffic load.

PLANS: All drawings or reproductions of drawings supplied by the Department to the Contractor pertaining to the construction or details of the Project.

A. Standard Sheets – Standardized plans containing details approved by the Department and the

FHWA, for construction of a given type on any project, included in contracts on an as-needed basis.

PRODUCT DATA (CATALOG CUT): Document(s) with information such as manufacturer's product specifications, manufacturer's installation instructions, standard color charts, wiring diagrams showing factory-installed wiring, printed performance curves and operational range diagrams. Product data that must be specially prepared because standard printed data is not suitable shall be considered shop drawings.

PROJECT: All work included under one Department contract, notwithstanding the occasional use by the Department of multiple project numbers for the work included within one contract.

PROJECT SITE (or SITE): The space available to the Contractor, under the Contract, for performing construction activities. The extent of the Project site is as indicated on the plans or elsewhere in the Contract.

QUALIFIED PRODUCTS LIST (QPL): A report that has been developed as a means for determining what products, suppliers, manufacturers, equipment and methodologies may be used on construction projects. This report can be located on the CT Department of Transportation Website:

[Connecticut DOT Qualified Products List Report](#)

RECLAIMED CONCRETE AGGREGATE: Reclaimed waste consisting of crushed and graded concrete removed from pavements, structures, or buildings. Metal may be acceptable only where it is contained as reinforcement within small fragments of concrete; *e.g.*, metal projecting from concrete fragments would be unacceptable. All such material trucked from beyond the limits of the Project must be accompanied by a Materials Certificate and Certified Test Report indicating that the material is environmentally acceptable and structurally sound in accordance with Section 1.06.07, unless the source of the material is a Department Project and that source is acceptable to the Engineer.

RECLAIMED MISCELLANEOUS AGGREGATE: Glass-free and clinker-free reclaimed waste, which has been crushed, graded and blended, as specified in the Contract, with natural crushed stone or gravel. Metal may be acceptable only where it is contained as reinforcement within small fragments of concrete; *e.g.*, metal projecting from concrete fragments would be unacceptable. All such material trucked from beyond the limits of the Project must be accompanied by a Materials Certificate and Certified Test Report indicating that the material is environmentally acceptable and structurally sound in accordance with Section 1.06.07, unless the source of the material is a Department Project and that source is acceptable to the Engineer.

RECLAIMED WASTE: Debris from the demolition of buildings, structures, and pavements; residue from incineration and recycled glass. Acceptable material shall include concrete, bituminous concrete, glass, ceramics, brick, pavement sub-base and base courses, and clinker from resource recovery plants. Metal may be acceptable only when it is contained within large fragments of concrete. Reclaimed waste trucked from beyond the limits of the Project must be accompanied by a Materials Certificate and Certified Test Report indicating that the waste is environmentally acceptable and structurally sound in accordance with Section 1.06.07, unless the source of the material is a Department Project and that source is acceptable to the Engineer.

RIGHT-OF-WAY: A general term denoting land, property of interest therein, usually in a strip, acquired for or devoted to transportation purposes.

ROADBED: The graded portion of a highway, including portions within the top and side slopes, which have been prepared as a foundation for the pavement structure and shoulders.

ROADWAY: The portion of the highway, including shoulders, which may be used for vehicular travel within the Project limits.

SHOP DRAWINGS: Drawings, including proposed details, diagrams, schedules, procedures and other supporting data, prepared by a Contractor to supplement the Contract documents, showing all information necessary for fabrication of items for which some specific design or detail appears in the Contract.

SHOULDER: The portion of the roadway adjacent to the traveled way that can accommodate stopped vehicles for emergency use, and that provides lateral support of base and surface courses.

SPECIFICATIONS: The Department's written provisions and requirements for the performance of the Contract, contained in or incorporated by the Contract.

- A. *Standard Specifications*—A set of specifications approved by the Department for general application and repetitive use, entitled the "Standard Specifications for Roads, Bridges, Facilities and Incidental Construction" found at the following link:

[Specifications for Roads, Bridges, Facilities and Incidental Construction](#)

B. *Supplemental Specifications*—Approved additions to and revisions of the Standard Specifications.

C. *Special Provisions*—Other Department specifications applicable to an individual project.

STATE: State of Connecticut.

SUBCONTRACTOR: Any individual, firm, partnership or corporation to which the Contractor sublets, with the approval of the Commissioner, any part or parts of the Project covered by the Contract.

SUBSTANTIAL COMPLETION: The date at which the performance of all work on the Project has been completed except minor or incidental items, final cleanup, work required under a warranty and repair of unacceptable work, and provided the Engineer has determined that:

- A. The Project is safe and convenient for use by the public, and
- B. All traffic lanes including all safety appurtenances are in their final configuration, and
- C. Failure to complete the work and repairs excepted above does not result in the deterioration of other completed work, and provided further, that the value of work remaining to be performed, and cleanup is less than 1% of the estimated final Contract amount, and
- D. If applicable, a Certificate of Compliance has been issued.

SUBSTITUTE: A replacement for a specified material, device, type of equipment, or method, which is sufficiently different in substance and function, quality, or workmanship to constitute a change in the Contract work.

SUBSTRUCTURE: All of that part of the bridge below the bearings of simple and continuous spans, skewbacks of arches and tops of footings of rigid frames, including backwalls, wingwalls and any protective railings mounted on the wingwalls.

SUB-SUBCONTRACTOR: Any individual, firm, partnership or corporation to which a subcontractor sublets, with the approval of the Commissioner, any part or parts of the Project covered by the Contract.

SUPERSTRUCTURE: The entire bridge except the substructure.

UTILITY: Any public service company and the plant of such a company or similar facilities. Such companies may consist of, but not be limited to, companies selling or controlling the sale, distribution or use of water, gas, electricity, communications systems, sewers and railroad lines. Such facilities may consist of, but not be limited to, wires, cables, ducts, pipes, manholes, transformers, poles, towers and tracks.

WORK: The provision of labor, materials or services necessary for or relating to the design and construction of the Project.

WORKING DRAWINGS: Drawings, calculations, procedures and other supporting data prepared by a Contractor, documenting the Contractor's proposed design, details, materials, construction methods and equipment for any construction for which no specific design or detail appears in the Contract.

1.01.02—Abbreviations, Publications and Standards: For publications and standards, the edition governing the work will be the edition in effect on the date the Contract was advertised for solicitation of bids. Whenever one of the following abbreviations is used in the Contract, its meaning shall be interpreted as follows:

AA—(The) Aluminum Association, Inc.

AABC—Associated Air Balance Council

AAMA—American Architectural Manufacturers Association

AAN—American Association of Nurserymen

AAPA—American Association of Port Authorities

AASHTO—American Association of State Highway and Transportation Officials

NOTE: Wherever reference is made to an AASHTO Standard Method of Test or Standard Specification, it refers by letter and number to the method or specification published by AASHTO in the "Standard Specifications for Transportation Materials and Methods of Sampling and Testing."

ABMA—American Bearing Manufacturers Association

ACGIH—American Council of Government Industrial Hygienists

ACI—ACI International (American Concrete Institute)

ACOE—Army Corps of Engineers

ADAAG—Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities

ADSC—The International Association of Foundation Drilling (formerly Association of Drilled Shaft Contractors)

AF&PA—American Forest & Paper Association
 AGA—American Gas Association
 AGC—(The) Associated General Contractors of America
 AHA—American Hardboard Association
 AHAM—Association of Home Appliance Manufacturers
 AI—Asphalt Institute
 AIA—(The) American Institute of Architects
 AISC—American Institute of Steel Construction
 AISI—American Iron and Steel Institute
 AITC—American Institute of Timber Construction
 A.L.I.—Automotive Lift Institute
 ALSC—American Lumber Standard Committee, Incorporated
 AMCA—Air Movement and Control Association International, Inc.
 AMRL—AASHTO Materials Reference Library
 ANLA—American Nursery and Landscape Association
 ANSI—American National Standards Institute
 AOAC—AOAC International
 AOSA—Association of Official Seed Analysts
 APA—APA-The Engineered Wood Association
 API—American Petroleum Institute
 AREMA—American Railway Engineering and Maintenance-of-Way Association
 ARI—Air-Conditioning & Refrigeration Institute
 ARTBA—American Road and Transportation Builders Association
 ASA—Acoustical Society of America
 ASC—Adhesive and Sealant Council
 ASCE—American Society of Civil Engineers
 ASHRAE—American Society of Heating, Refrigerating and Air-Conditioning Engineers
 ASME—ASME International (The American Society of Mechanical Engineers International)
 ASNT—American Society for Non-Destructive Testing
 ASSE—American Society of Sanitary Engineering
 ASTM—American Society of Testing and Materials (ASTM International)
 NOTE: Wherever reference is made to an ASTM specification, test method, or practice, it refers by letter, number, or both to standards published by ASTM International in the "ASTM Standards Source™ Database."
 ATSSA—American Traffic Safety Services Association
 AWI—Architectural Woodwork Institute
 AWPA— American Wood Protection Association (*formerly* American Wood-Preservers' Association)
 AWPI—American Wood Preservers Institute
 AWS—American Welding Society
 NOTE: Wherever reference is made to an AWS materials specification, inspection methods, or welding procedures, it refers by section number to standards of the American Welding Society published in the applicable steel, or aluminum welding code.
 AWWA—American Water Works Association
 BHMA—Builders Hardware Manufacturers Association
 BIA—(The) Brick Industry Association
 BOCA—BOCA International, Inc.
 CBM—Certified Ballast Manufacturers Association
 CCRL—Cement and Concrete Reference Laboratory
 CDA—Copper Development Association (The)
 CFR—Code of Federal Regulations
 CGA—Compressed Gas Association
 CGS—Connecticut General Statutes (as revised)
 CISCA—Ceilings and Interior Systems Construction Association
 CISPI—Cast Iron Soil Pipe Institute

CLFMI—Chain Link Fence Manufacturers Institute
 ConnDOT—Connecticut Department of Transportation
 CRI—(The) Carpet and Rug Institute
 CRSI—Concrete Reinforcing Steel Institute
 CSI—(The) Construction Specifications Institute
 CSSB—Cedar Shake & Shingle Bureau
 CTDOT—Connecticut Department of Transportation
 CTI—Cooling Technology Institute
 DASMA—Door and Access Systems Manufacturers Association, International
 DEEP—Connecticut Department of Energy and Environmental Protection
~~DEP—Connecticut Department of Environmental Protection~~ *see* DEEP
 DHI—Door and Hardware Institute
 DOD—Department of Defense Military Specifications and Standards
~~DPUC—Department of Public Utility Control~~ *see* PURA
 EIA—Electronic Industries Alliance
 EPA—Environmental Protection Agency
 FAA—Federal Aviation Administration
 FCC—Federal Communications Commission
 FCICA—Floor Covering Installation Contractors Association
 FHWA—Federal Highway Administration
 FMG—FM Global
 FRA—Federal Railway Administration
 FS—Federal Specification

NOTE: Wherever reference is made to FS in the contract, it refers by number, letter, or both, to the latest standard or tentative standard of the Federal Specification Unit, General Services Administration, Federal Supply Service, as to materials, specifications, or methods of testing, whichever the case may be.

FTA—Federal Transit Administration
 GA—Gypsum Association
 GANA—Glass Association of North America
 GSA—General Services Administration
 HI—Hydraulics Institute
 HPVA—Hardwood Plywood & Veneer Association
 ICC—International Code Council
 ICC-ES—ICC Evaluation Service, Inc.
 ICEA—Insulated Cable Engineers Association, Inc.
 ICRI—International Concrete Repair Institute
 IEC—International Electrotechnical Commission
 IEEE—(The) Institute of Electrical and Electronics Engineers, Inc.
 IES—Illuminating Engineers Society
 IESNA—Illuminating Engineering Society of North America
 IGCC—Insulating Glass Certification Council
 IGMA—Insulating Glass Manufacturers Alliance
 IMSA—International Municipal Signal Association
 IRI—HSB Industrial Risk Insurers
 ISO—International Organization for Standardization
 ITE—Institute of Traffic Engineers
 IUPAT—International Union of Painters and Allied Trades
 IWRD—Inland Wetlands Resource Division
 KCMA—Kitchen Cabinet Manufacturers Association
 LMA—Laminating Materials Association
 LPI—Lightning Protection Institute
 MASH—Manual for Assessing Safety Hardware
 MBMA—Metal Building Manufacturers Association

MILSPEC—Military Specification and Standards
 MMA—Monorail Manufacturers Association
 MSHA—Mine Safety and Health Administration
 MSS—Manufacturers Standardization Society of The Valve and Fittings Industry, Inc.
 MUTCD—Manual on Uniform Traffic Control Devices
 NAAMM—National Association of Architectural Metal Manufacturers
 NACE—National Association of Corrosion Engineers
 NADCA—National Air Duct Cleaners Association
 NAIMA—(The) North American Insulation Manufacturers Association
 NBFU—National Board of Fire Underwriters
 NCHRP—National Cooperative Highway Research Program
 NCMA—National Concrete Masonry Association
 NCPI—National Clay Pipe Institute
 NEAUPG—NorthEast Asphalt User/Producer Group
 NEBB—Natural Environmental Balancing Bureau
 NEC—National Electrical Code
 NECA—National Electrical Contractors Association
 NEMA—National Electrical Manufacturers Association
 NEPCOAT—North East Protective Coatings Committee
 NESC—National Electrical Safety Code
 NETA—InterNational Testing Association
 NETTCP—NorthEast Transportation Technician Certification Program
 NFPA—National Fire Protection Association
 NFRC—National Fenestration Rating Council
 NHLA—National Hardwood Lumber Association
 NICET—National Institute for Certification in Engineering Technologies
 NIOSH—National Institute of Occupational Safety and Health
 NIST—National Institute of Standards and Technology
 NLGA—National Lumber Grades Authority
 NOAA—National Oceanic and Atmospheric Administration
 NRCA—National Roofing Contractors Association
 NRMCA—National Ready-Mixed Concrete Association
 NSBA—National Steel Bridge Alliance
 NSC—National Safety Council
 NSF—NSF International
 NTMA—National Terrazzo and Mosaic Association, Inc.
 OEO—Office of Equal Opportunity
 OLISP—Office of Long Island Sound Programs
 OSHA—Occupational Safety and Health Administration
 PCA—Portland Cement Association
 PCI—Precast/Prestressed Concrete Institute
 PDI—Plumbing & Drainage Institute
 PTI—Post-Tensioning Institute
 PURA—Public Utilities Regulatory Authority
 RMA—Rubber Manufacturers Association
 SAE—SAE International (formerly Society of Automotive Engineers)
 SDI—Steel Deck Institute *or*
—Steel Door Institute
 SFPA—Southern Forest Products Association
 SHRP—Strategic Highway Research Program
 SJI—Steel Joist Institute
 SMACNA—Sheet Metal and Air Conditioning Contractors National Association
 SPIB—(The) Southern Pine Inspection Bureau
 SPRI—Single Ply Roofing Institute

SSPC—The Society for Protective Coatings (*formerly* The Steel Structures Painting Council)

NOTE: Where reference is made to SSPC in the Contract, it refers by number, letter, or both, to the latest standard or tentative standard specification as to materials specifications, methods of testing, systems, procedures, inspection or other specification pertaining to any or all phases of cleaning or painting, whichever may apply.

SWRI—Sealant, Waterproofing, & Restoration Institute

TCA—Tile Council of America, Inc.

TIA—Telecommunications Industry Association

TIA/EIA—Telecommunications Industry Association/Electronics Industries Alliance

TPI—Truss Plate Institute, Inc.

TRB—Transportation Research Board

UFAS—Uniform Federal Accessibility Standards

UL—Underwriters Laboratories Inc.

USCG—United States Coast Guard

USDA—United States Department of Agriculture

USGBC—U.S. Green Building Council

USSWG—United States Steel Wire Gauge

WCLIB—West Coast Lumber Inspection Bureau

WCSC—Window Covering Safety Council

WDMA—Window & Door Manufacturers Association

WWPA—Western Wood Products Association

1.01.03—Abbreviations and Terms: Abbreviations and terms used in the Contract are in lieu of and are to be construed in the same way as are the terms or phrases following them in the list below. Those abbreviations and terms include, but are not necessarily limited to:

ABS—acrylonitrile butadiene styrene

AC—alternating current

ACCM Pipe or ACCMP—Asphalt-Coated Corrugated Metal Pipe

ACSR—Aluminum Conductor, Steel Reinforced

A.E.A.—Air Entraining Admixture

AIC—Ampere Interrupting Current

AOEC—Area of Environmental Concern

APA—Aquifer Protection Area

AWG—American Wire Gauge

B & B—balled and burlapped

bbl—barrel

BCPC—Bituminous Concrete Park Curbing

Bit.—bituminous

Bit. Conc.—bituminous concrete

CAPWAP—Case Pile Wave Analysis Program

CAS—Coating Applicator Specialist

CB—catch basin

CCA—chromated copper arsenate

CCM Pipe or CCMP—coated corrugated metal pipe

CICU—controller interface communications unit

CLLCU—closed loop local coordination unit

CLMU—closed loop master unit

CMS—Changeable Message Sign

Conc.—concrete

CPE Pipe or CPEP—corrugated plastic or polyethylene pipe

CPS—centipoise second

CUF—Commercially Useful Function

CWI—Certified Welding Inspector

cwt.—hundredweight or 100 pounds

DBE—Disadvantaged Business Enterprise

DBH—Diameter at breast height
 DC—direct current
 dist.—distillation
 DMT—Division of Materials Testing
 DTI—Direct Tension Indicator
 EW—endwall
 est.—estimated
 exc—excavation
 fi—jacking tension
 FRC—Fiberglass Reinforced Composite
 f' c—specified minimum compressive strength at a specified age
 f' ci—required strength at time of transfer
 ga—gauge or gage
 GFRP—glass fiber reinforced polymer
 Gsa—Apparent specific gravity
 Gsb—Bulk specific gravity
 HASP—Health and Safety Plan
 HMA—hot mix asphalt or bituminous concrete
 HRB—Rockwell B Scale hardness
 HRC—Rockwell C Scale hardness
 Hz—hertz
 IMC—Intermediate Metal Conduit
 IP—internet protocol
 I.P.S.—Iron Pipe Size
 IWRC—Independent Wire Rope Core
 JMF—job mix formula
 KD—Kiln Dried
 KDAT—Kiln Dried After Treatment
 kip—1000 pounds
 ksf—kips per square foot
 LCD—Liquid Crystal Display
 LED—light-emitting diode
 LRFD—Load & Resistance Factor Design
 l.s.—lump sum
 mbf—1000-foot board measure
 MBR—metal beam rail
 Mgal—1000 gallons
 MH—manhole
 MLSI—Major Lump Sum Item
 MPT—Maintenance and Protection of Traffic
 N.C.—National Coarse
 NDT—non-destructive testing
 Pavt.—pavement
 PCBC—precast concrete barrier curb
 PCC—Portland Cement Concrete
 PE—polyethylene
 Perf. ACCM Pipe or Perf. ACCMP—Perforated Asphalt-Coated Corrugated Metal Pipe
 Perf. CCM Pipe or Perf. CCMP—Perforated Coated Corrugated Metal Pipe
 Perf. CPE Pipe or Perf. CPEP—Perforated Corrugated Plastic or Polyethylene Pipe
 pfmd.—preformed
 PROM—programmable read only memory
 psf—pounds per square foot
 psi—pounds per square inch
 p/s—prestressed

PVC—polyvinyl chloride
 Pwa—Percent water absorbed
 QCPFA—Quality Control Plan for Fine Aggregates
 RAP—reclaimed asphalt pavement
 RC—Reinforced Concrete
 RCCE—Reinforced Concrete Culvert End
 RC Pipe *or* RCP—Reinforced Concrete Pipe
 RFC—Request for Change
 RFI—Request for Information
 RMC—Rigid Metal Conduit
 SD—system detector
 SDR—Standard Dimension Ratio (ratio of pipe diameter to wall thickness)
 sec.—second
 sol.—soluble
 sp. gr.—specific gravity
 sp. visc.—specific viscosity
 SSA—Sole Source Aquifer
 SSP—Subspecies
 std.—standard
 surf.—surface
 TDC—Transportation Division Chief
 THHN—Heat resistant thermoplastic, insulated nylon jacket, 90°C, 600 V building wire
 THWN—Moisture and heat resistant thermoplastic, insulated nylon jacket, 75°C, 600 V building wire
 TL—Test Level
 TMA—Truck Mounted Impact Attenuator
 TMP—Transportation Management Plan
 tsf—tons per square foot
 TTC—Temporary Traffic Control
 U'drain *or* Udrain—Underdrain
 UNC—Unified National Coarse
 USB—Universal Serial bus
 UTCS—urban traffic control system
 UV—ultra-violet or ultra violet light
 VAC—Volts Alternating Current
 VDC—Volts Direct Current
 VECP—Value Engineering Change Proposal
 VMS—Variable Message Sign
 VOC—Volatile Organic Compound
 VT—vitrified tile
 W—watt
 WSA—Temporary Waste Stockpile Area

**SECTION 1.04
SCOPE OF WORK**

Replace Section 1.04 in its entirety with the following:

**SECTION 1.04
SCOPE OF WORK**

1.04.01—Intent of Contract

1.04.02—Changes in Quantities of Pay Items, Including Elimination of Such Items

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1.04.05—Extra Work

1.04.06—Removal and Disposal of Structures on the Work Site

1.04.07—Rights in and Use of Materials Found on the Work Site

1.04.01—Intent of Contract: The Contract directs and obliges the Contractor to perform the Project described in strict compliance with the Contract terms, including its specifications, plans, special provisions, and other Contract documents. If the Engineer revises any of those terms in writing during the life of the Contract, the Contractor must comply with said revised terms. Among other things, the Contract obliges the Contractor to perform all Project work in conformity with the lines, grades, typical cross-sections, dimensions, and other data shown on the plans and other Contract documents. The Department will pay the Contractor only for work (including materials necessary for that work, whether or not they are incorporated into that work) that the Contractor has actually performed under a Contract pay item, and only if the Engineer has accepted said work. (See 1.02.03 herein.) (The Contract as it existed when first duly executed by the Engineer is sometimes referred to herein as “the original Contract.”)

1.04.02—Changes in Quantities of Pay Items, Including Elimination of Such Items: The quantities given in the original Contract for Contract pay items are only estimates of the quantities of those items that may be required for Project completion. (The quantities for given pay items in the original Contract are sometimes referred to herein as the “estimated quantities” or “original quantities.”) A change in the original quantity of a Contract pay item (whether an increase or decrease of the quantity) shall be deemed to have occurred when the Engineer explicitly orders said change of quantity or when the change of quantity has been necessitated by a construction order or other written direction issued by the Engineer to the Contractor.

A Contract pay item shall be deemed a Major Item if the item’s lump sum priced in the original Contract, or its original quantity multiplied by its unit price in the original Contract, is equal to or greater than 10% of the original Contract’s total bid price. All other Contract items shall be deemed Minor Items.

The provisions of 1.04.03 herein shall govern changes in compensation related to a “significant change” in Contract work (as such changes are defined in 1.04.03) necessitated by a written order of the Engineer.

The provisions of 1.04.04 herein shall govern changes in compensation related to any differing site condition encountered by the Contractor that affects its performance of Contract work.

The provisions of 1.04.03 or 1.04.04 shall govern in any case in which they conflict with another provision of the Contract.

If the Engineer and the Contractor together determine that a particular change in compensation to the Contractor should be made due to a change in a Contract pay item quantity (including an item’s complete elimination), they may make that change in compensation by a written agreement to do so.

Changes in Quantities to Minor Items:

(a) Quantity Increases of More Than 25% over Original Quantity: If the actual quantity of work authorized and accepted by the Engineer under a Contract pay item exceeds the item’s original quantity by 25%, the Department will pay for the quantity in excess of 125% of the original quantity in one of the following three ways. (One-time fixed costs for which the Department has already reimbursed the Contractor in paying for 125% of the original quantity shall not be included in a calculation of the actual cost of the excess units.)

- (1) Pay for the aggregate excess units on a cost-plus basis as provided in 1.09.04.
- (2) Adjust the unit price by the increase or decrease in the unit price for the excess units, which shall be the difference between the original Contract unit price and the actual unit cost (calculated on a cost-plus basis as provided in 1.09.04) of the excess units, said difference to be calculated as of the time when work under the item was completed.

(3) Pay for the units in any other manner agreed on in writing by the Engineer and the Contractor. If, however, the aggregate payment for the units in excess of 125% is less than \$25,000 (using the original Contract unit price for the calculation) the Engineer will not adjust that unit price.

(b) Quantity Decreases of More Than 25% below Original Quantity: If the actual quantity of a Contract pay item authorized and accepted by the Engineer is less than 75% of the item's original quantity, the Engineer will not adjust the original Contract unit price for said item unless the Contractor makes a written request to the Engineer for such adjustment and the Engineer grants it in writing. If the Engineer grants such a request, the Engineer will adjust the price for each accepted unit of said item performed or provided in one of the following three ways:

- (1) Pay for the total item units actually performed or provided in the aggregate units on a cost-plus basis as provided in 1.09.04.
- (2) Adjust the unit price by any increase in the unit price for the deficit units, which shall be the difference between the original Contract unit price and the actual unit cost (calculated on a cost-plus basis as provided in 1.09.04) of the total units performed or provided, said difference to be calculated as of the time when work under the item was completed.
- (3) Pay for the item units performed or provided in any manner agreed on in writing by the Engineer and the Contractor.

In no instance however, shall the unit price paid for the number of units performed or provided, when their quantity has been decreased by more than 25% of the original quantity, be less than their original unit price; and in no instance shall the aggregate payment for such a decreased quantity of items be more than the Engineer would have paid for the performance or provision of 75% of the original quantity at the original unit price.

Regarding treatment of eliminated Contract items, refer to 1.09.05 herein.

1.04.03—Changes in Quantities and Significant Changes in the Character of Work:

- (i) The Engineer reserves the right to make, in writing, at any time during the work, such changes in quantities and such alterations in the work as are necessary to satisfactorily complete the Project. Such changes in quantities and alterations shall not invalidate the Contract nor release the surety, and the Contractor agrees to perform the work as altered.
- (ii) If the alterations or changes in quantities significantly change the character of the work under the Contract, whether such alterations or changes are in themselves significant changes to the character of the work or by affecting other work cause such other work to become significantly different in character, an adjustment, excluding anticipated profit, will be made to the Contract. The basis for the adjustment shall be agreed upon prior to the performance of the work. If a basis cannot be agreed upon, then an adjustment will be made either for or against the Contractor in such amount as the Engineer may determine to be fair and equitable.
- (iii) If the alterations or changes in quantities do not significantly change the character of the work to be performed under the Contract, the altered work will be paid for as provided elsewhere in the Contract.
- (iv) The term "significant change" shall be construed to apply only to the following circumstances:
 - (A) When the character of the work as altered differs materially in kind or nature from that involved or included in the original proposed construction; or
 - (B) When a Major Item of work, as defined elsewhere in the Contract, is increased in excess of 125% or decreased below 75% of the original Contract quantity. Any allowance for an increase in quantity shall apply only to that portion in excess of 125% of original Contract item quantity, or in case of a decrease below 75%, to the actual amount of work performed.

1.04.04—Differing Site Conditions:

- (i) During the progress of the work, if subsurface or latent physical conditions are encountered at the Site differing materially from those indicated in the Contract or if unknown physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the work provided for in the Contract, are encountered at the Site, the party discovering such conditions shall promptly notify the other party in writing of the specific differing conditions before the Site is disturbed and before the affected work is performed.
- (ii) Upon written notification, the Engineer will investigate the conditions, and if it is determined that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the Contract, an adjustment, excluding anticipated profits, will be made and the Contract modified in writing accordingly. The Engineer will notify the Contractor of

the determination whether or not an adjustment of the Contract is warranted.

- (iii) No Contract adjustment which results in a benefit to the Contractor will be allowed unless the Contractor has provided the required written notice.
- (iv) No Contract adjustment will be allowed under this clause for any effects caused on unchanged work.

1.04.05—Extra Work: Unforeseen work made necessary by the Engineer's changes of the Contract plans or specifications, or work that is necessary for completion of the Project, but for which no price is provided in the Contract, shall be done in accordance with the requirements of the specifications and as directed by the Engineer. The Engineer shall notify the Contractor of the necessity for such extra work, stipulating its character and extent, and shall notify the Contractor as to whether the Engineer wants the Contractor to propose a unit price or, lump sum price, or to perform the extra work on a cost-plus basis in accordance with 1.09.04. The Engineer need not solicit any price for the extra work from the Contractor, but may, in any event, simply order the Contractor to perform the extra work on a cost-plus basis. If the Engineer does solicit from the Contractor a unit or lump sum price for the extra work, the Contractor must propose such a price in writing within 5 days of the Engineer's request for one.

The Contractor's price proposal shall be itemized and reasonably detailed, and shall include all known or anticipated direct and indirect costs of the work, including but not limited to, the costs of all safety and other equipment, small tools, labor, subcontractor quotes, consumables, field office overhead, home office overhead, insurance, bonding, and profit.

The character and extent of the extra work, together with the basis of compensation, shall be communicated to the Contractor by means of a construction order which, when signed by the Engineer, shall become a part of the Contract. If a Contractor objects to any portion of a construction order submitted to it, the Contractor must, within 15 days of its receipt of said order, return the order with a letter to the Department's Assistant District Engineer administering the Contract, describing specifically what portions of the order the Contractor finds objectionable, the nature of its objections, and the bases for its objections. If the Contractor does not do so, it shall be deemed to have accepted the terms of the construction order.

If the Engineer changes the scope of Contract work, the Contractor shall submit a proposed revised schedule and a cost revision proposal, which takes all such changes into account, if the Contractor believes that such revisions are warranted. If the schedule is to be revised, it will be revised in accordance with 1.08.08.

1.04.06—Removal and Disposal of Structures on the Work Site: All structures on the Project site which are not to remain on the Project site after completion of the Project shall be removed from said site and disposed of by the Contractor once it is no longer needed for the Project, and any such structure shall then become the property of the Contractor, except as otherwise required or provided by 1.10.07.

1.04.07—Rights in and Use of Materials Found on the Work Site: Upon written request of the Contractor and with the written approval of the Engineer, subject to limitations which may be set forth within such approval, any stone, gravel, sand, topsoil or any material from existing bridge substructures, buildings, or other structures, found within the limits of the Project may be excavated or removed and used by the Contractor on the Project, provided that said materials meet the requirements of the specification for such materials. Any materials excavated or removed shall not be taken off the Project site unless the Engineer in writing specifically authorizes such action. The following conditions shall govern these matters:

1. Excavation or removal of materials that would necessarily be excavated or removed in making the improvement will be paid for at the applicable Contract unit prices; and, in addition, the item for which this material is used will also be paid for at its Contract unit price. The Contractor will not be charged for such materials. The Contractor shall, without compensation, place in the embankment or elsewhere, as appropriate, sufficient suitable material to fill the space that the excavated materials would have occupied, unless otherwise directed by the Engineer.
2. The excavation or removal of materials that are not required to be excavated or removed in connection with the Contract work will not be paid for; and the Contractor will be charged for such materials at a negotiated unit price. The item for which this material is used will be paid for at its Contract unit price. The Contractor shall, without compensation, backfill with accepted material the space that the excavated materials had occupied, to the satisfaction of the Engineer, unless otherwise directed by the Engineer.

Surplus material shall be removed from the Project only with the Engineer's written permission. The Engineer may determine that such material is not surplus, and may order that it be incorporated into the Project.

**SECTION 1.05
CONTROL OF THE WORK**

In the list of Articles, change the titles of 1.05.03 “Conformity with Plans and Specifications” and 1.05.14 “Termination Clause,” and add 1.05.23 as follows:

1.05.03—Conformity with Plans and Specifications (including Quality Control)

1.05.14—Termination for Convenience

1.05.23—Requests for Information (RFIs) and Requests for Change (RFCs)

Replace Article 1.05.03 with the following:

1.05.03—Conformity with Plans and Specifications (including Quality Control): The Contractor shall perform all work and provide all materials in conformity with the lines, grades, cross-sections, dimensions and material requirements, including tolerances, shown on the plans or indicated in the Contract specifications, or as directed by the Engineer.

Quality Management Plan: The Contractor shall maintain and implement a written Quality Management Plan (QMP). The QMP shall document the overall internal quality control operating procedures for the Contractor to meet or exceed Contract requirements. The details of the QMP must discuss how the Contractor will ensure that:

- Work processes are performed efficiently and as documented
- Work processes out of conformance are quickly identified
- Corrective action is quickly taken to bring such work processes back into conformance

The QMP must include the following components:

- Identification of Contractor staff and their specific duties and responsibilities with regard to execution of the QMP
- Standard operating procedures and frequency of quality control inspection and testing used to measure quality before, during and after those procedures
- Action plan for reporting and reacting to nonconformance and quality control issues

The Contractor shall furnish a copy of the QMP to the Engineer prior to the start of the work. The Contractor must revise the QMP if, as determined by the Engineer, the Contractor’s procedures prove to be inadequate or ineffective in producing work that meets the Contract requirements. Failure of the Contractor to comply with the provisions of this Article may result in a suspension of work in whole or in part. The Department will not grant the Contractor additional Contract time or compensation in connection with such a suspension.

Change the title of Article 1.05.14 “Termination for Convenience Clause” as follows:

1.05.14—Termination for Convenience:

Add Article 1.05.23 as follows:

1.05.23—Requests for Information (RFIs) and Requests for Change (RFCs): The Contractor shall send all RFIs and RFCs to the Engineer in PDF format for review. All RFIs will be responded to within 10 calendar days of receipt by the Engineer. All RFCs will be responded to within 21 calendar days of receipt by the Engineer. If additional information is required from the Contractor for the Engineer to respond to the RFI or RFC, the time to respond to such will begin once the Contractor has provided the additional information.

**SECTION 1.06
CONTROL OF MATERIALS**

Replace Section 1.06 in its entirety with the following:

**SECTION 1.06
CONTROL OF MATERIALS**

1.06.01—Source of Supply, Buy America and Material Quality

1.06.02—Samples and Test

1.06.03—Storage

1.06.04—Defective Materials

1.06.05—Shipping Material

1.06.06—Vacant

1.06.07—Certified Test Reports and Materials Certificates

1.06.08—Warranties, Guarantees and Instruction Sheets

1.06.01—Source of Supply, Buy America and Material Quality:

1. Source of Supply: A source of supply is defined as the original manufacturer of material(s) used within a project. A source of supply may fabricate material(s) such as precast concrete structures or hot mix asphalt from components originally manufactured by others. A broker or distributor of material(s) must not be identified as a source of supply.

The Contractor must notify the Engineer of the proposed source of supply for each of the materials listed on the Anticipated Source of Material (CON-083) Form within 30 days after bid award. Should it become necessary for the Contractor to obtain material from sources other than those indicated in the submitted Anticipated Source of Material (CON-083) Form, the Contractor shall notify the Engineer. The Engineer reserves the right to request additional information regarding such sources.

If, at any time, the Department discovers that materials from a source of supply do not consistently conform to the Contract specifications, the Engineer will notify the Contractor of its nonconformance and that source of supply shall no longer be used for said application.

2. Buy America: All permanently incorporated steel and iron used in the construction of the Project must have been produced and fabricated in the United States. It is the intent of this specification to require that all manufacturing processes for all steel and iron materials and products to be used for the Project, including the coating of steel and iron, occur within the United States, with the following exceptions:

The Contractor may request, in accordance with Section 635.410(b)(4) of Title 23 CFR, approval to include a minimal amount of foreign steel in the Project construction. This amount is defined as 1/10 of 1% of the total Contract price or \$2,500.00, whichever is greater. The cost of the foreign steel or iron is defined as its Contract value when delivered to the Project site.

Additionally, the FHWA has granted a nationwide waiver of the requirements of 23 CFR 635.410, Buy America requirements, for the production of pig iron and processed, pelletized, and reduced iron ore. Items not specifically included in the waiver remain subject to the Buy America requirements. The Contractor may request the Engineer to seek from the FHWA a further waiver of said requirements, but it shall be at the sole discretion of the Engineer whether or not to seek such a waiver.

3. Material Quality: Only materials conforming to the Contract and accepted by the Engineer shall be permanently incorporated into the Project.

Prior to installation, material that is damaged or otherwise changed in a way that it no longer meets Contract specifications shall not be incorporated into the Project.

When one manufacturer's product is specified in the Contract, it shall be understood that this represents the standard required. Unless otherwise stated, a comparable product of another manufacturer may be proposed by the Contractor unless the plans or special provisions indicate that no equal will be allowed. The Contractor shall submit a complete description of the proposed product, together with shop drawings, catalog cuts, product data or other descriptive literature for review in accordance with 1.05.02. Should a product be designated as an equal, this will not relieve the Contractor from any material testing requirements or a related Certified Test Report and/or Materials Certificate that may be required.

1.06.02—Samples and Test: The Contractor shall furnish all required samples without charge, and provide secure facilities for their storage. The Contractor shall provide means for, and shall assist in the verification of, all scales, measures and other devices that it operates or uses in connection with the Project.

The Contractor shall provide calibration documentation when requested.

The minimum number and size of material samples per Contract item that are required by the Department are listed in the "Minimum Schedule for Acceptance Testing," found in Chapter 8 contained in the [Department's Materials Testing Manual](#). The acceptance methods used to determine compliance with the Contract are also listed. Where applicable, physical testing will be performed in accordance with the test standards which are in effect at the time of bidding, unless otherwise indicated in the Contract. Any item or material not listed in the "Minimum Schedule for Acceptance Testing," or Contract shall be sampled and tested and/or certified, as directed by the Engineer.

Certification may be used as the basis for approval of such materials as the Contract documents specify or as the Engineer may require. With regard to such materials, the Contractor shall furnish the Engineer a Certified Test Report (CTR) and/or Materials Certificate (MC), in accordance with 1.06.07 for each type of material, as may be required in the "Minimum Schedule for Acceptance Testing." The Contractor shall bear any costs involved in furnishing the CTR and MC.

If the Contractor has purchased materials for use on a previous Department project and if they meet the requirements of this Contract, then those materials, with the approval of the Engineer, may be used for the Project, provided that the Contractor, acting as the "supplier," submits a related MC meeting the requirements of 1.06.07. This MC shall further identify the project for which the material was originally purchased and shall be accompanied by a copy of the original MC.

Materials will be rejected by the Engineer whenever, in their judgment, they fail to meet Contract requirements. The Engineer may accept material or the combination of materials and thereby waive noncomplying test results, provided that the following conditions are met:

1. The Engineer finds results of prior and subsequent series of tests of the material or materials from the same source or sources to be satisfactory.
2. The incidence and degree of nonconformance with the Contract requirements are, in the Engineer's judgment, within reasonable limits.
3. The Contractor, in the Engineer's judgment, had diligently exercised material controls consistent with good practices.
4. No adverse effect on the value or serviceability of the completed work could result from said degree of nonconformance.

The Engineer may, in their discretion, waive testing of minor quantities of a particular material if said material was obtained from sources that have furnished supplies of the material that have consistently met Department testing standards.

1.06.03—Storage: The Contractor shall store all materials for the Project in a way that ensures that their quality and fitness for the Project will be preserved, and that the Engineer will have easy and prompt access to them for inspection purposes. Materials shall be kept on wooden platforms or on other hard, clean surfaces and not on the ground. When so directed by the Engineer, the Contractor shall store materials in a weatherproof building.

The Contractor shall not store materials in any way that would lead to a violation of these specifications including but not limited to 1.10. Stored materials, even if they have been approved by the Engineer prior to their storage, must be inspected by the Engineer and meet all pertinent Contract requirements immediately prior to use of those materials for the Project.

1.06.04—Defective Materials: Unless otherwise permitted by the Engineer, all materials not meeting Contract requirements shall be considered defective, shall be rejected, and shall be removed immediately from the Project site.

If deemed necessary, the Engineer may require retesting of materials previously tested, accepted and incorporated into the Project. If materials do not meet the Contract requirements after retesting, the Engineer will make a determination whether to allow materials be left in place (with an equitable reduction of payment) or be removed and replaced. No rejected material, the defects of which have been subsequently corrected, shall be used until approval has been given by the Engineer. Should the Contractor fail to comply with these requirements, the Engineer has the authority to order the removal and replacement of defective material and deduct the cost of such removal and replacement from any future payments to the Contractor.

When a material is fabricated, or treated with another material, or when any combination of materials is assembled to form a product, any or all of which are covered by the Contract specifications, the failure of any components of the product to meet the requirements of the specifications may be sufficient cause for

the rejection of the whole combination or product.

1.06.05—Shipping Material: Any conveyance used for transporting materials must be clean when used, be in proper working condition, have a strong and substantial body that will prevent the loss of materials during transportation, and be approved by the Engineer.

1.06.06—Vacant

1.06.07—Certified Test Reports and Materials Certificates: The Contractor shall furnish the Engineer with any Certified Test Report and Materials Certificate required by the Contract and the "Minimum Schedule for Acceptance Testing" contained in Chapter 8 of the [Department's Materials Testing Manual](#).

The Contractor shall forward the Certified Test Report and Materials Certificate to the Engineer, and, in addition, shall deliver a copy of same to the Department's inspector at the Site. Materials for which such documentation is required may be conditionally incorporated into the Project prior to the Engineer's acceptance of a Certified Test Report and a Materials Certificate; however, payment for such incorporated material may not be made prior to acceptance by the Department of a Certified Test Report and Materials Certificate indicating that the material meets the Contract requirements.

1. A Certified Test Report (CTR) is a document containing a list of the dimensional, chemical, metallurgical, electrical and physical results obtained from a physical test of the materials involved, and shall demonstrate that the materials meet the requirements of the Contract. The CTR shall be signed by a duly-authorized and responsible agent of the original manufacturer of the material(s), and the signature must include the date the CTR was signed and notarized.

The CTR shall also include the following information:

- a. Description of material(s)
- b. Date of manufacture of the material(s)
- c. Date of test(s)
- d. Name of organization to which the material has been consigned
- e. Quantity of material represented
- f. Means of identifying the consignment, such as label, marking, lot number, etc.
- g. Date and method of shipment
- h. Name of organization performing the test(s)

2. A Materials Certificate (MC) is a document certifying that the materials, components and equipment furnished meet all requirements of the Contract. The MC shall be signed by a duly-authorized and responsible agent of the organization assembling or fabricating the materials and the signature must include the date the MC was signed and notarized. Such MC shall also include the following information:

- a. Project for which the material has been consigned
- b. Name of Contractor to which material is supplied
- c. Item number and description of material
- d. Quantity of material represented by the MC
- e. Means of identifying the consignment, such as label, marking, lot numbers, etc.
- f. Identification of all sources of supply of material components
- g. Means of verifying Buy America requirements for steel and/or steel components
- h. Date and method of shipment

1.06.08—Warranties, Guarantees and Instruction Sheets: Manufacturers' warranties and guaranties furnished for materials used for the Project, as well as instruction sheets and parts lists supplied with Project materials, shall be delivered to the Engineer prior to acceptance of the Project. Each warranty or guaranty so furnished shall indicate its commencement and expiration dates.

**SECTION 1.07
LEGAL RELATIONS AND RESPONSIBILITIES**

Replace Article 1.07.09 with the following:

1.07.09—Protection and Restoration of Property: The Contractor shall not enter upon public or private property for any purpose without having obtained written permission to do so from the owner of such property, and having provided the Engineer with a copy of same. The Department is not, and may not be deemed a party to any agreement between the Contractor and a property owner unless the Department executes said agreement.

The Contractor shall use every reasonable precaution to avoid disturbing or damaging public or private property, including, but not limited to, trees and monuments. The Contractor shall use suitable precautions to avoid disturbing or damaging underground or overhead structures or facilities, whether or not they are shown on the plans.

If the Project requires the moving or removal of a land monument or property marker, the Contractor shall not disturb it until a duly-authorized agent of the public or private property's owner has witnessed or recorded the monument or marker's location. The Contractor shall not move or remove such property until and unless directed to do so by the Engineer.

The Contractor shall not remove, cut, injure or destroy trees or shrubs without the Engineer's prior approval.

The Contractor shall be responsible for all damage to property resulting from any act, omission, neglect or misconduct in the Contractor's manner or method of executing its work, or due to its defective work or materials. When or where any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the Project work, the Contractor shall restore, at its own expense, such property to a condition as close as possible to that which existed before such damage was done, by repairing, rebuilding or otherwise restoring the property, as may be directed by the Engineer; or the Contractor shall make good such damage in another manner acceptable to the Engineer. If the Contractor fails to restore such property or make good such damage in a way acceptable to the Engineer, the Engineer may, upon 48 hours' notice, proceed to have such property repaired, rebuilt or restored as he may deem necessary; and the cost thereof will be deducted from any monies due or which may become due the Contractor under the Contract or under any other contract(s) that the Contractor may have with the State.

The Engineer shall mark the locations of underground facilities belonging to the State when given 72 hours' (excluding Saturdays, Sundays, and State holidays) notice by the Contractor that it will be excavating or driving material into the ground near such facilities as a part of necessary Contract work. After the Engineer marks the location of such facilities, it will be the Contractor's responsibility to maintain the location markers until no longer needed. Repairs of State facilities located further than 1 ft from the line delineated by such markers shall be paid for by the State.

In Article 1.07.10, add the following paragraph:

" It is further understood and agreed by the parties hereto, that the Contractor shall not use the defense of Sovereign Immunity in the adjustment of claims or in the defense of any suit, including any suit between the State and the Contractor, unless requested to do so by the State."

Replace Article 1.07.18 with the following:

1.07.18—Use of State Property: The Contractor may not use State property for any purpose or activity other than carrying out the construction activities required by the Contract, except with the prior written consent of the Engineer.

Such other activities, which require the Engineer's advance consent, include, but are not limited to, the establishment of staging areas, storage areas, asphalt plants, concrete plants, or gravel/borrow pits; or the conduct of screening, crushing, manufacturing, or mining operations.

Any permitted use of the Project site or other State property for such other purposes or activities must be for the performance of the specific Contract only, and must be at no cost to the State. In addition, the Contractor may not assert or bring any claim or formal proceeding for damages or additional compensation

based on either the approval or denial of a request to make such use of the Project site or other State property.

Under no circumstances shall the bulk storage of fuel or lubricants by the Contractor or its agents be permitted on State property.

The Contractor shall not conduct work process or store any construction materials or supplies of such types, quantities or configuration, either individually or in total, on, under or near a structure, that creates an unreasonable risk of substantial damage to State property.

The Contractor shall not store any hazardous materials on State property other than those that are integral to the Contractor's performance of the Contract, as allowed by the Contract and in accordance with 1.10, or in writing from the Engineer. The Contractor shall have the responsibility and duty to ensure the proper storage, handling, management and disposal of any such hazardous materials. The Contractor shall be liable to the Department for all remedial or punitive costs, damages or penalties incurred by the Department as a result of the Contractor's failure to fulfill this duty.

The Engineer may require environmental testing of the affected site at the Contractor's expense both prior to and upon completion of the Contractor's permitted use of the site or of other related State property. The Contractor shall be responsible for ensuring that such a site is restored to the condition required by the Engineer and that all contaminants deposited on the site by the Contractor or its agents are removed and properly disposed of. All such restoration and removal activities must be carried out at the Contractor's expense, and must be carried out in accordance with the provisions of the Department's Required Best Management Practices, any applicable environmental permits, and all other applicable State or Federal laws or regulations.

The Contractor must submit any request to use State property for a staging or storage area to the District Engineer at the District Construction Office. The following information, at a minimum, must accompany such written request:

- (a) A detailed description of the proposed operation or use of State property.
- (b) A site plan detailing the proposed location of any operations, materials, or facilities related to the requested use, including any appropriate sedimentation or erosion controls.
- (c) An area plan detailing anticipated ingress to and egress from the site of the proposed activity or the Project site, as appropriate, and indicating the location of and proximity to residential or occupied buildings in the vicinity.
- (d) Copies of any related, required or affected environmental permits.
- (e) A detailed listing or description of the anticipated dates and hours of the proposed operations or activities.
- (f) Photo documentation (a minimum of 12 - 8 inch x10-inch color photographs) as follows:
 - (i) the preconstruction condition of each site of the proposed activities and
 - (ii) adjacent property at the boundaries of those areas.

If the site to be used or affected is State property that lies outside of any Department right-of-way, the Contractor must also obtain from other State agencies all necessary or appropriate authorizations for the proposed use(s) of State property.

Any request by the Contractor relating to a proposed use of State property for activities other than the establishment of a construction staging or storage area must also be submitted to the District Engineer at the District Construction Office, and must include the same information required by (a) through (f) of the preceding paragraph. In addition, in connection with such other requests, the Contractor must submit to the District Engineer

- (a) written confirmation from the municipality or municipalities in which each affected site is located that each such municipality has no objection to the proposed use or activity; and
- (b) a license agreement with the Department, executed by the Contractor, on terms acceptable to the Department, defining the nature and scope of the proposed use or activity.

Gore areas are not available for disposal of surplus material.

For any request to establish or operate an asphalt batching or continuous mix facility, the Contractor must also provide to the District Engineer at the District Construction Office a map detailing the outermost perimeter of the proposed facilities and operations, showing all related and potentially-affected structures, land uses, watercourses, wetlands, and other areas of environmental concern within 1/3 of a mile of the facility or operation perimeter. No such facility will be permitted on State property where any hospital, nursing home, school, area of environmental concern, watercourse, or residential housing exists within the perimeter of 1/3 mile from the facility or operation (as per Public Act 98-216).

**SECTION 1.08
PROSECUTION AND PROGRESS**

In the list of Articles, change the title of 1.08.10 "Annulment of Contract" as follows:

1.08.10— Termination of Contract for Cause

Replace Article 1.08.08 with the following:

1.08.08—Extension of Time: The Contractor may present to the Engineer a request in writing for an extension of Contract time if the time necessary for completion of the Project has been increased due to extra or added work or delays resulting from unforeseeable causes beyond the control and without the fault or negligence of the Contractor, except for weather or seasonal conditions (unless extraordinary and catastrophic). Such causes include, but are not limited to, natural catastrophes, acts of the State in either its sovereign or contractual capacity, acts of another contractor in the performance of a contract with the State, the presence of utility facilities (including railroads), fires, strikes, floods, or delays by suppliers arising from unforeseeable causes beyond the control and without the fault or negligence of either the Contractor or such suppliers.

The Contractor's plea that insufficient Contract time was allowed under the Contract before commencement of the Project is not a valid reason for extending the Contract time. Requests for an extension of time with adequate substantiation must be presented within 60 calendar days from the event that is the basis of the request or from the first effect of such an event on the Project. The Contractor will be responsible for providing all the documentation necessary to support the reasonableness of the additional time requested. This shall include a Critical Path Method Schedule Analysis and accompanying narrative that includes the specific dates and number of days for which the extension is sought, the basis or bases for the extension, and the schedule analysis illustrated in a graphic representation of the schedule impacts such as a bar chart or other type of graphical schedule. The critical path is a sequence of activities in a project wherein none of the activities can be delayed without affecting the final project end date.

Such requests will be considered by the Engineer and granted to the extent that he deems to be fair and reasonable. Requests will not be considered if based on delays caused solely by conditions existing at the time the bids were received and of which the Contractor might reasonably be expected to have had full knowledge at the time, or upon delays caused by failure on the part of the Contractor to anticipate properly the requirements of the Project as to materials, labor, or equipment. For all Project delays or time increases, except as provided below, additional Contract time is the sole remedy that the Contractor may have, and such periods of additional Contract time shall be deemed "Non-Compensable Delays." For delays caused by the State in its Contractual capacity, the Contractor may, in addition to a time extension, request additional compensation to reimburse it for damages sustained as a direct result of such delay, and such periods of extended Contract time may be deemed "Compensable Delays."

The period of compensable delay is limited as follows:

- (1) it may not include time more than 60 days prior to the Engineer's receiving written notice from the Contractor, with adequate substantiation, of its intent to claim damages for the delay, and
- (2) it may not include periods of delay for which the State was responsible, but during which the Contractor experienced concurrent delays for which the State was not responsible.

Damages for periods of Project delay for which the State had sole responsibility shall be limited to the increased costs incurred by the Contractor (which shall not include lost profits), which the Contractor substantiates and which the Contractor shows were caused by such delays.

If an approved extension of Contract time extends beyond November 30, the number of days of the approved extension remaining on that date will not begin to run again until the following April 1.

The Critical Path Method Schedule Analysis shall include at a minimum:

1. The manner in which the Contractor planned to construct the Project, in terms of activities, logical interrelationships of activities, work sequences, activity durations, and calendars.
2. The actual duration and sequences of the activities, based on what actually occurred on the Project.
3. The variances between the planned and actual performance of the work, listed in a chronological and cumulative manner, summing to the net total delay on the Project at the time of the request.
 - a. The causes of the variances between the planned and actual performance of the work, specifically

- allocating legal responsibility for each to either the Department or the Contractor.
- b. The effects of the variances in work sequences, activity durations, manpower, and resources on the incurred costs of the affected party or parties.
 4. An identification analysis of the causes of any concurrent delays on the Project.
 5. Statements as to whether the time extension days sought are compensable or non-compensable, along with a specific statement of any compensation requested in connection with the time extension. Any request for a time extension that does not include a corresponding request for compensation will be assumed to be a request for a non-compensable time extension.
 6. All associated analysis documents, worksheets, schedules and contemporaneous documents supporting the Critical Path Method Schedule Delay Analysis.

Replace Article 1.08.10 "Annulment of Contract" with the following:

1.08.10—Termination of Contract for Cause: The Commissioner may give notice in writing to the Contractor and its surety of any delay, neglect, or default of the Contractor which the Commissioner believes has occurred, including one or more of the following:

1. Failure to begin the Project on the date specified in the Notice to Proceed.
2. Failure to perform the Project with sufficient personnel, equipment or materials to ensure timely Project completion.
3. Unsuitable performance of the Project or failure to perform Project work in accordance with the Contract.
4. Failure or refusal to remove or correct work rejected by the Engineer.
5. Discontinuance of suitable prosecution of the Project for a period of 72 hours, excluding Sundays and holidays, without written authorization to do so from the Engineer.
6. Failure to recommence discontinued work within 48 hours (excluding Sundays and holidays) after being ordered to do so by the Engineer.
7. Insolvency, filing for bankruptcy, or any act or occurrence which may render the Contractor financially incapable of completing the Project.
8. Failure to satisfy any final judgment for a period of 30 calendar days.
9. Making of any assignment for the benefit of creditors.
10. Violation of any provisions of the Contract.
11. Any other cause which, in the judgment of the Commissioner, warrants termination, including, but not limited to, violations of the antitrust or criminal laws, and attempts to deceive or defraud the Department in material matters.

If the Contractor or surety within a period of 10 calendar days after such notice does not proceed in conformance with the directions set forth in the notification, or fails to present a remedial plan of operation satisfactory to the Commissioner, then the Commissioner may, at his discretion, order the surety to complete the Project or, without violating the Contract, take the right to control and prosecute the Project out of the hands of said Contractor and surety. No termination of the Contract for such cause will be deemed to have occurred, however, unless the Commissioner himself or herself (and not merely a designated representative of his or hers) expressly declares it in a writing to the Contractor.

The Department may acquire or rent whatever materials or equipment are necessary in order to complete the Project and may seize and use for purposes of the Project (with any appropriate compensation to the Contractor) any material or equipment that the Contractor acquired or purchased expressly for the Project in accordance with a specific Contract requirement.

The Department may also enter into an agreement, either by negotiation or public letting, for the completion of the Contract according to the terms and provisions thereof, or use such other methods or combinations thereof as in the Commissioner's opinion shall be required or desirable for the completion of the Contract in an acceptable manner. All costs and charges incurred by the Department, in connection with completing the Project under the Contract, or as a result of the Contractor's default, shall be deducted from any monies due to or which may become due to the Contractor. In case such expense exceeds the sum which would have been payable under the Contract, then the Contractor and the surety shall be liable for, and shall pay to the State, the amount of the excess.

SECTION 1.09
MEASUREMENT AND PAYMENT

Replace Articles 1.09.04 and 1.09.05 with the following:

1.09.04—Extra and Cost-Plus Work: Extra work shall be performed only under the conditions and subject to the requirements outlined in 1.04.05. Payment for extra work may be made on any unit price or lump sum price or other basis to which the Engineer and the Contractor agree in writing, or the Engineer may order that the Contractor will be paid for the work on the cost-plus basis described in this Article.

The following sets forth the components of the cost-plus basis for making payments:

(a) Labor:

- (1) For all labor used by the Contractor for the subject work, the Department will pay the Contractor the wage rate that it actually paid for same, as shown by its certified payroll, which shall be at least the minimum rate established for the Project by the CT Department or the U.S. Department of Labor. For all foremen in direct charge of Project work, the Department will pay the Contractor the actual wage paid to the foremen as shown on the Contractor's certified payroll.
- (2) The Department will reimburse the Contractor for the actual costs paid to, or on behalf of, workers by reason of allowances, health and welfare benefits, pension fund benefits and other such benefits in connection with the subject work, when such amounts are required by a collective bargaining agreement or another employment contract generally applicable to the classes of labor employed on the Project. The Contractor shall certify all such costs in writing to the Engineer.
- (3) For property damage, liability and workmen's compensation insurance premiums, unemployment insurance contributions and social security taxes on Project cost-plus work, the Department will reimburse the Contractor for its actual Project costs. The Contractor shall provide to the Engineer documentation, satisfactory to the Engineer in form and substance, of all such costs.
- (4) The Department will also pay to the Contractor an amount equal to 20% (15% for overhead, 5% for profit) of the total sums described in **(a)** (1) through (3) above.

No part of the salary or expenses of anyone connected with the Contractor's forces above the grade of foreman, who provides general supervision of Project work, will be included in the above payment calculations, except when the Contractor's organization is entirely occupied with cost-plus work, in which case the salary of a superintendent may be included in said labor item when the nature of the pertinent Project work is such that, in the opinion of the Engineer, a superintendent was required for that work. The Engineer and the Contractor may agree in writing to the allowable rate of pay for such superintendent, or the Engineer may make payment based on such rate as he deems reasonable.

The Engineer reserves the right to determine the number and type of personnel to be employed for the cost-plus Project work.

(b) Specialized Work: When the Engineer directs the Contractor to perform specialized work requiring skills, tools and equipment substantially unlike those ordinarily used by the Contractor or its authorized Project subcontractors, the Department will pay the Contractor for the use of a specialist to perform the specialized work. For such specialized services, including materials incorporated into the Project, the Department will pay the Contractor its actual costs, plus additional compensation in accordance with subparagraph (e) below. If so requested by the Engineer, the Contractor shall obtain and submit to the Engineer, prior to performing such specialized work, a minimum of three price quotes for the work.

(c) Materials: For all materials necessary for cost-plus Project work, the Department will pay the Contractor its actual cost for such materials, including delivery charges as shown by original receipted bills, plus 15 % of the sum of said cost and charges.

In lieu of receipted bills for materials used for the Project, but which were not specifically purchased for the Project, but rather were taken from the Contractor's stock, the Contractor shall provide to the Engineer an affidavit certifying that such materials were not purchased for the Project, that the materials were taken from the Contractor's stock, that the quantity claimed to have been used on the Project was actually so used, and that the price claimed for the materials reflects their fair market value at the time of their use on the Project. The Department will pay for costs of transporting the materials to the Project site, in accordance with subparagraphs (a) and (d) hereof.

The Department will not reimburse the Contractor for any penalty or charge incurred by the Contractor due to the Contractor's late or delayed payment for the pertinent materials.

(d) Equipment: All equipment used for cost-plus Project work must, in the judgment of the Engineer, be

in good working condition and suitable for its Project purpose; and the Engineer reserves the right to determine the size and number of units of equipment to be used for such work. The manufacturer's ratings shall be the basis for all Rental Rate Blue Book classifications used for payment purposes. ("Rental Rate Blue Book" as used in these specifications refers to the current edition of the Rental Rate Equipment Watch Blue Book Services, taking into account all current Rate Adjustment Tables, and amendments thereof.)

Trucks will be classified by cubic-yard capacity.

No percentage mark-up will be added for payment purposes to amounts charged by the Contractor based on equipment rental rates.

The Department will not pay rental rates for small tools needed to complete the cost-plus Project work.

For payment purposes, estimated operating costs per hour from the Rental Rate Blue Book will apply only to the actual time during which the equipment is actively being used to perform cost-plus Project work.

For equipment that is also being used for non-cost-plus Project work, the Department will pay the applicable hourly rate only for the actual time that the equipment was assigned to cost-plus Project work. The applicable period of assignment for each piece of equipment shall start when the equipment commences to be used for cost-plus Project work ordered by the Engineer, and shall end at the time designated by the Engineer.

For equipment brought to the Site exclusively for cost-plus work, the Department will reimburse the Contractor for loading and unloading costs and costs of transporting such equipment to and from the Project site; provided, however, that payment for return transportation from the Site shall not exceed the cost of moving the equipment to the Site. If such a piece of equipment is self-propelled, and is driven to the Site under its own power, then the Department will pay only operating costs and labor costs for its transport to and from the Project site. The Department will not, however, pay for any loading, unloading and transportation costs if the equipment is used for any Project work on the Site other than cost-plus work.

- (1) Owned Equipment: The Department will pay the Contractor the applicable rental rate set forth in the Rental Rate Blue Book for any equipment (1) which the Contractor uses, with the Engineer's authorization, to perform cost-plus Project work, and (2) which is owned by the Contractor or a subsidiary, affiliate, or parent company of the Contractor (no matter how far up or down the chain of ownership from the Contractor).

The maximum hourly rate to be used in paying for Contractor-owned equipment assigned to cost-plus work shall be the applicable monthly rate in the Rental Rate Blue Book, divided by 176 (176 being the number of working hours per month).

Should the proper completion of the cost-plus Project work require equipment of a type not covered by the Rental Rate Blue Book, the Engineer will determine, and the Department will make payment to the Contractor at, a reasonable rental rate based on relevant rates prevailing in the area of the Project. If practicable, such rates shall be determined by the Engineer before the affected work is begun. If the Contractor proposes that the Engineer use a particular rate in such an instance, the Contractor must disclose to the Engineer the specific sources of, or support for, said rate.

If a piece of equipment owned by the Contractor is assigned to cost-plus Project work, but remains idle for some portion of the period of the cost-plus work, the Department will pay for that idle time at 50% of the applicable rental rate (exclusive of operating costs) in the Rental Rate Blue Book.

For payment purposes, the period of equipment usage shall be deemed to start when the Contractor begins to use the equipment for cost-plus Project work and shall be deemed to end when the equipment is released by the Engineer from use for such work. Any hours during which the equipment is used for work other than cost-plus Project work will be deducted from the pertinent payment period.

For any piece of Contractor-owned equipment assigned to cost-plus Project work, the Department will reimburse the Contractor for an aggregate minimum of 8 hours (of use time, idle time, or a combination thereof) in each 24-hour day (measured from one midnight to the following midnight) during the assignment period. No such reimbursement will be made, however, for Saturdays, Sundays and legal holidays during which the Contractor does no Project work, or for any other day on which the Engineer orders the Contractor to do no Project work. If the equipment is used to perform cost-plus Project work for more than 8 hours in a day, the Department will pay the Contractor at the applicable hourly rate computed on a monthly basis for the actual time of use; however the Department will not pay the Contractor for more than 8 hours of idle time for a piece of equipment during a given day.

The Department shall have the right to limit its aggregate Project payments for idle time for a given

piece of equipment to the replacement value of that equipment.

- (2) **Rented Equipment:** If the Engineer determines that in order to perform the cost-plus Project work the Contractor must rent certain machinery, trucks or other equipment not owned by the Contractor or a subsidiary, affiliate, or parent company of the Contractor (no matter how far up or down the chain of ownership from the Contractor), the Contractor shall provide to the Engineer in writing, in advance of such rental:

1. the specific nature of the rental(s),
2. the reasons for its need for such rental(s),
3. the anticipated or proposed rental rate(s), and
4. the estimated duration for the use of each piece of such rented equipment.

Proposed rates for such rented equipment must be based on the following:

- A daily rate per hour when the equipment is to be specifically assigned to Project work by the Engineer for a period of 7 consecutive calendar days or less.
- A weekly rate per hour when such assigned time exceeds 7 consecutive calendar days, but does not exceed 21 consecutive calendar days.
- A monthly rate per hour when such assigned time exceeds 21 consecutive calendar days.

The applicable daily, weekly, or monthly rate will be determined at the expiration of 21 calendar days or upon release of the equipment by the Engineer, whichever occurs first. Interruptions of the rental period, when equipment is used for work other than assigned cost-plus work, will not entitle the Contractor to payment at a rental rate that would be applicable to a shorter period that might arguably have been occasioned by such interruptions.

If so requested by the Engineer, the Contractor shall, prior to renting such equipment, obtain and submit to the Engineer in writing a minimum of three rate quotes for rental of the equipment.

The Department will pay the Contractor for such rental at the rate actually paid by the Contractor, provided that the given use and rental rate are acceptable to the Engineer. In order to obtain such payment, the Contractor must provide the Engineer with a copy of the original receipted bill for the rental expenses incurred.

(e) **Administrative Expense:** When extra work is performed on a cost-plus basis by a subcontractor acceptable to the Engineer, the Department will pay the Contractor an additional 7.5% for that work; such payment will be in addition to the percentage payments described in (a), (b), (c) and (d) above, as a reimbursement for the Contractor's administrative expense in connection with such work. The Engineer will approve such additional payments only if and when the Contractor provides to the Engineer receipted invoices for all relevant costs.

(f) **Miscellaneous:** The compensation provided for in (a), (b), (c), (d) and (e) above shall be deemed to be payment in full for the extra work, and shall be deemed as full compensation for same, including costs of superintendence, use of small tools, equipment for which no rental is allowed, safety equipment, consumables, field office overhead, home office overhead, bonding, other insurance, and profit. The Contractor's representative and the Engineer shall compare their respective records related to the extra work done on a cost-plus basis at the end of each day. Copies of these records shall be signed by both the Engineer and the Contractor's representative. The Engineer will then forward a copy of same to the Contractor and to any affected subcontractor in accordance with Department procedures. Upon payment of such costs by the Contractor, the Contractor shall immediately furnish the Engineer with original receipted bills covering the costs, including transportation charges, for all materials used for such work.

1.09.05—Eliminated Items: The Engineer may eliminate from the Contract any pay unit item, or any portion of Project work contained in a lump sum item by giving written notice of said elimination to the Contractor. Such elimination shall in no way invalidate the Contract.

The Engineer will make final payment to the Contractor for materials at the actual cost of the materials for eliminated pay unit items or portions of work contained in a lump sum item only under the following terms and conditions:

1. the materials were ordered by the Contractor prior to the Engineer's issuance to the Contractor of a written notice of the unit or work's elimination (as evidenced by a dated invoice from the vendor);
2. the materials conformed to all Contract requirements; and
3. the Contractor could not have cancelled its order within 2 days after the issuance of the elimination notice.

Any materials paid for by the Department on these conditions shall then be the property of the State, and the State will assume, or will reimburse the Contractor for, the actual cost of any further handling necessary to deliver said materials to a location designated by the Engineer.

If the relevant materials purchased by the Contractor are returnable to their vendor and if the Engineer so directs, the Contractor shall return the materials to the vendor, in which case the Department will reimburse the Contractor for any reasonable charges made to the Contractor by the vendor for the return of the materials, and for the actual costs to the Contractor of its handling the materials in returning them to the vendor. Such reimbursements by the Department shall be computed as though the work were being paid for on a cost-plus basis under 1.09.04.

If the Engineer determines that an elimination of a pay unit item, or portion of work contained in a lump sum item constitutes a "significant change" in the character of the Contract work, as defined under 1.04.03 necessitated by a written order of the Engineer, the terms of 1.04.03 shall govern the payment to be made in relation to the eliminated item or work.

**SECTION 1.11
CLAIMS**

Replace Section 1.11 in its entirety with the following:

**SECTION 1.11
CLAIMS**

1.11.01—General**1.11.02—Notice of Claim****1.11.03—Record Keeping****1.11.04—Claim Compensation****1.11.05—Required Claim Documentation****1.11.06—Auditing of Claims**

1.11.01—General: When the Contractor files against the Department or the State a formal claim (a “formal” claim being one that seeks resolution through binding arbitration or court litigation, rather than through negotiation or mediation) under C.G.S Section 4-61 as revised (“Section 4-61”), whether as a Section 4-61 notice of claim, demand for arbitration or as a complaint in the Superior Court, the Contractor must follow the procedures and comply with the requirements set forth in this Section of the Specifications, as well as those set forth in Section 4-61. If this Section sets forth additional, more specific, or demanding requirements than does Section 4-61 in any respect, this Section shall govern the matter. While the requirements of this Section may not strictly apply to informal claims (“informal” claims being those which the Contractor seeks to resolve through negotiations with the Department, in or outside of a mediation) for additional compensation or other relief from the Department, the Contractor should understand that the Department may need and may demand (in which case the Contractor must provide), the same kinds of documentation and other substantiation that are required under this Section for formal claims. In addition, any time extension request submitted as part of a claim, must satisfy the requirements of this provision and those of 1.08.08. It is the intent of the Department to compensate the Contractor for actual increased costs caused by or arising from acts or omissions on the part of the Department that violate legal or contractual duties owed to the Contractor by the Department.

1.11.02—Notice of Claim: Whenever the Contractor intends to file a demand for arbitration or a court complaint against the Department under Section 4-61, the Contractor must first notify the Commissioner of the details of said claim, in writing via certified mail (in strict compliance with Section 4-61), and such written notice must contain all pertinent information described in 1.11.05 below.

Once a formal notice of a claim under Section 4-61 has been given to the Commissioner, the claimant may not change the claim in any way, in either concept or monetary amount, except insofar as the claim seeks damages that will continue to accrue after submission of the notice, in ways described and anticipated in that notice.

1.11.03—Record Keeping: The Contractor shall keep daily records identifying:

- (1) each aspect of the Project affected by matters related to any claim for additional compensation or relief that the Contractor has filed, intends to file, or has reason to believe that it may file against the Department;
- (2) the specific Project locations where Project work has been so affected;
- (3) the number of people working on the affected aspects of the Project at the pertinent time(s); and
- (4) the types and number of pieces of equipment on the Site at the pertinent time(s).

All events or conditions that have a potential or anticipated effect on the Project’s progress or schedule and that may result in a claim by the Contractor shall be documented contemporaneously with the event or discovery of the pertinent condition(s), or immediately thereafter. If this is not done, the Contractor may not file the related claim and may not be awarded relief upon it. Without such information, the Department and the Office of the Attorney General may not be able to adequately determine what claims have merit or to what extent they have merit, or what amounts of compensation may be warranted and supportable. Moreover, State officials involved in the analytic or negotiation process may not be able to properly substantiate and support the recommendations that they must make to their superiors, including the Attorney General, and sometimes the Governor, in the course of a settlement process.

1.11.04—Claim Compensation: If the Contractor proves entitlement for damages, payment shall be

made in accordance with the following provisions:

1. **Compensable Items:** The liability of the Department for claims will be limited to the following specifically-identified items of cost, insofar as they have not otherwise been paid for by the Department (for instance, through payment for extra work, which under 1.04.05 includes overhead and profit), and insofar as they were caused solely by the actions or omissions of the Department or its agents.

The Department will pay for direct labor expenses, direct costs for materials, and direct costs for active equipment use, plus an additional ten percent (10%) of the total amount of such direct costs as payment for home office overhead and profit.

Compensable delay-related costs: The Department will pay for any additional field office overhead and idle equipment costs for each day of Project Critical Path delay or suspension caused solely by action or inaction of the Department.

If the Critical Path delay or suspension period is less than 30 calendar days, the Department will pay an additional ten percent (10%) of the additional field office overhead costs as payment for home office overhead and profit. For delays less than 30 calendar days, idle equipment will be paid at 50% of the Rental Rate Blue Book rate.

For delays equal to or longer than 30 calendar days, the Department will pay a per diem rate, calculated as six percent (6%) of the original total Contract amount divided by the original number of days of Contract time, as payment for home office overhead and profit.

In paying for idle equipment equal to or longer than 30 calendar days, the Department will pay for actual equipment costs. Actual equipment costs shall be based upon records kept in the normal course of business and in accordance with generally-accepted accounting principles. Under no circumstances shall Blue Book or other guide or rental rates be used for this purpose (unless the Contractor had to rent the equipment from an unrelated party, in which case the actual rental charges paid by the Contractor, so long as they are reasonable, shall be reimbursed by the Department).

If the final Contract Value is greater than the original Contract Value, any delay-related costs that are compensable under this Article shall be reduced by eight percent (8%) of the difference between the final Contract Value and the original Contract Value.

Such payments for compensable delay-related costs shall be deemed to be complete and mutually-satisfactory compensation for field and home office overhead related to the period of delay or suspension.

Subcontractor costs of any kind, however, may be paid for by the Department only (a) in the context of a negotiated claims settlement or (b) if the Contractor has itself paid or legally-assumed, present unconditional liability for those subcontractor costs.

2. **Non-Compensable Items:** The Department will have no liability for the following specifically-identified non-compensable items:
 - (1) Profit in excess of that provided for herein.
 - (2) Loss of anticipated profit.
 - (3) Loss of bidding opportunities.
 - (4) Reduction of bidding capacity.
 - (5) Home office overhead in excess of that provided for herein.
 - (6) Attorney's fees, claims preparation expenses, or other costs of claims proceedings or resolution.
 - (7) Any other consequential or indirect expenses or costs, such as tort damages, or any other form of expense or damages not provided for in these Specifications or elsewhere in the Contract.

1.11.05—Required Claim Documentation: All claims shall be submitted in writing to the Commissioner, and shall be sufficient in detail to enable the Engineer to ascertain the basis and the amount of each claim, and to investigate and evaluate each claim in detail. When submitting any claim over \$50,000, the Contractor shall certify in writing, under oath and in accordance with the formalities required by the Contract, that the following are true:

1. That supporting data is accurate and complete to the Contractor's best knowledge and belief;
2. That the amount of the dispute and the dispute itself accurately reflects what the Contractor in good faith believes to be the Department's liability.

The certification shall be executed by an officer or general partner of the Contractor having overall responsibility for the conduct of the Contractor's affairs.

When submitting a claim to the Commissioner, as a minimum, the Contractor must provide the following

information for each and every claim and sub-claim asserted:

- (a) A detailed factual statement of the claim, with all dates, locations and items of work pertinent to the claim.
- (b) A statement of whether each requested additional amount of compensation or extension of time is based on provisions of the Contract or on an alleged breach of the Contract. Each supporting or breached Contract provision and a statement of the reasons why each such provision supports the claim must be specifically identified or explained.
- (c) Excerpts from manuals or other texts which are standard in the industry, if available, that support the Contractor's claim.
- (d) The details of the circumstances that gave rise to the claim.
- (e) The date(s) on which any and all events resulting in the claim occurred, and the date(s) on which conditions resulting in the claim first became evident to the Contractor.
- (f) Specific identification of any pertinent document, and detailed description of the substance of any material oral communication, relating to the substance of such claim.
- (g) The name, function, and pertinent activity of each Contractor's or subcontractor's official, or employee involved in or knowledgeable about events that give rise to, or facts that relate to, the claim.
- (h) The amount(s) of additional compensation sought and a break-down of the amount(s) into the categories specified as payable under 1.11.04 above.
- (i) The name, function, and pertinent activity of each Department official, employee or agent involved in or knowledgeable about events that give rise to, or facts that relate to, the claim.

1.11.06—Auditing of Claims: All claims filed against the Department shall be subject to audit by the Department or its agents at any time following the filing of notice of such claim. The Contractor and its subcontractors and suppliers shall cooperate fully with the inquiries and document requests of the Department's auditors. Failure of the Contractor, its subcontractors, or its suppliers to maintain and retain records that are sufficient to enable the Department or its agents to fully evaluate the claim shall constitute a waiver of any portion of such claim that cannot be verified by specific, adequate, contemporaneous records, and shall bar recovery on any formal claim or any portion of such a claim for which such verification is not produced. Without limiting the foregoing requirements, and as a minimum, the Contractor shall make available to the Department and its agents the following documents in connection with any claim that the Contractor submits:

- (1) Daily time sheets and foreman's daily reports.
- (2) Union agreements, if any.
- (3) Insurance, welfare, and benefits records.
- (4) Payroll register.
- (5) Earnings records.
- (6) Payroll tax returns.
- (7) Records of property tax payments.
- (8) Material invoices, purchase orders, and all material and supply acquisition contracts.
- (9) Materials cost distribution worksheets.
- (10) Equipment records (list of company equipment, rates, cost pools, etc.).
- (11) Vendor rental agreements.
- (12) Subcontractor and vendor subcontracts, purchase orders, and/or agreements including all change orders and modifications.
- (13) Subcontractor and vendor invoices to the Contractor, and the Contractor's certificates of payments to subcontractors and vendors.
- (14) Subcontractor payment certificates.
- (15) Canceled checks (payroll, subcontractors, and vendors).
- (16) Job cost reports.
- (17) Job payroll ledger.
- (18) General ledger, general journal (if used), and all subsidiary ledgers and journals, together with all supporting documentation pertinent to entries made in these ledgers and journals.
- (19) Cash disbursements journals.
- (20) Financial statements for all years reflecting the operations on the Project.
- (21) Income tax returns for all years reflecting the operations on the Project.

- (22) Depreciation records on all company equipment, whether such records are maintained by the company involved, its accountant, or others.
- (23) If a source other than depreciation records is used to develop costs for the Contractor's internal purposes in establishing the actual cost of owning and operating equipment, all such other source documents.
- (24) All documents which reflect the Contractor's actual profit and overhead during the years that the Project was being performed, and for each of the five years prior to the commencement of the Project.
- (25) All documents related to the preparation of the Contractor's bid, including the final calculations on which the bid was based.
- (26) All documents which relate to the claim or to any sub-claim, together with all documents that support the amount of damages as to each claim or sub-claim.
- (27) Worksheets used to prepare the claim, which indicate the cost components of each item of the claim, including but not limited to the pertinent costs of labor, benefits and insurance, materials, equipment, and subcontractors' damages, as well as all documents which establish the relevant time periods, individuals involved, and the Project hours and the rates for the individuals.

**SECTION 1.20
SUPPLEMENTED GENERAL CLAUSES FOR FACILITIES CONSTRUCTION**

**SECTION 1.20-1.01
DEFINITION OF TERMS AND
PERMISSIBLE ABBREVIATIONS FOR
FACILITIES CONSTRUCTION**

Replace Section 1.20-1.01 in its entirety with the following:

**SECTION 1.20-1.01
DEFINITION OF TERMS AND
PERMISSIBLE ABBREVIATIONS FOR
FACILITIES CONSTRUCTION**

1.20-1.01.00—Facilities Construction - Definitions

1.20-1.01.02—Facilities Construction - Abbreviations, Publications and Standards

1.20-1.01.03—Facilities Construction - Abbreviations and Terms

1.20-1.01.01—Facilities Construction - Definitions: In these specifications, unless the context requires otherwise, words of the masculine gender include the feminine and the neuter, and, when the sense so indicates, words of the neuter gender may refer to any gender. Where appropriate, words in the singular form shall be deemed to include the plural, and words in the plural form to include the singular.

ADDENDUM: Contract revisions developed and incorporated into the contract after bid advertisement and before the opening of bid proposals.

AIR OPERATIONS AREA: Any paved or unpaved area of the airport used or intended to be used for the unobstructed movement of aircraft. These movements shall include landings, takeoffs, and surface maneuverings.

AWARD: The Department's acceptance in writing of the proposal of the lowest responsible bidder for the work, subject to the execution and approval by the Department of a contract therefor and the provision by the bidder of performance and payment bonds to secure the performance thereof which are acceptable to the Commissioner, and to such other conditions as may be specified by the Department or required by law.

BID: The submission of a proposal for the work contemplated.

BID ADVERTISEMENT: A public announcement soliciting bids for a contract for work to be performed or materials to be furnished.

BIDDER: Any individual, firm, partnership, corporation, or combination thereof, submitting a proposal for the work contemplated, acting directly or through a duly authorized representative

BID MANUAL: "The State of Connecticut Department of Transportation Construction Contract Bidding and Award Manual," copies of which are available from the Department's Division of Contracts and at the following link: [Construction Contract Bidding and Award Manual](#)

CALENDAR DAY: Every day shown on the calendar, Sundays and holidays included.

CATALOG CUT (PRODUCT DATA): Document(s) with information such as manufacturer's product specifications, manufacturer's installation instructions, standard color charts, wiring diagrams showing factory-installed wiring, printed performance curves and operational range diagrams. Product data that must be specially prepared because standard printed data is not suitable shall be considered shop drawings.

CERTIFICATE OF COMPLIANCE: The formal document issued at the completion of a project by the State Building Inspector. The document is often referred to informally as a "Certificate of Occupancy," "C.O.C." or "C.O."

CHANNEL: A channel shall be interpreted to mean a natural or artificial watercourse having an average width at the bottom, after excavation, of 4 feet or more.

COMMISSIONER: State of Connecticut Transportation Commissioner acting directly or through a duly-authorized representative.

CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL: This [Department of Energy and Environmental Protection \(DEEP\) Bulletin](#) is intended to provide information to government agencies and the public on soil erosion and sediment control.

CONNECTICUT STORMWATER QUALITY MANUAL: This [DEEP publication](#) provides guidance on measures necessary to protect waters of the State from adverse impacts of post-construction stormwater runoff.

CONSTRUCTION ORDER, CHANGE ORDER: A written order signed by the Engineer for a contractor to perform work or provide supplies stipulated therein at the price or upon the basis of payment

set forth therein.

CONTRACT: The agreement covering the performance of the work and the furnishing of materials required for the construction of the Project. The Contract shall be deemed to include the "Plans," "Specifications" (*i.e.*, the Department's "Standard Specifications for Roads, Bridges, Facilities and Incidental Construction" which is in effect on the date of the Bid Advertisement), "Construction Orders," and such other provisions as may be incorporated into the agreement, in addition to the contents of the bound contract containing the schedule of prices, signature sheet, addenda, special provisions, required federal and state provisions, supplemental specifications, labor and wage schedules, permits and other such material.

CONTRACTOR: When the word is capitalized, the party of the second part to the Contract, acting directly or through its agents or employees. When this word is not capitalized, it is to be taken in its more general sense.

CULVERT: A covered channel or a large pipe for carrying a watercourse below ground level, usually under a road or railway.

DEPARTMENT: State of Connecticut Department of Transportation.

DESIGNER: A duly-authorized representative of the Engineer, responsible for the design of the Project.

DRAINAGE DITCH: A paved or unpaved, artificially-constructed open depression having an average width of less than 4 feet at the bottom, after excavation, constructed for the purpose of carrying off surface water.

ENGINEER: The Commissioner or Deputy Transportation Commissioner, acting directly or through a duly-authorized representative.

EXECUTION OF CONTRACT: The date of execution of the Contract by the Department is the date on which the Department's authorized signatory signs the Contract on behalf of the Department.

EQUAL: A material, device, type of equipment, or method other than what is specified in the Contract, which is a recognized equivalent in substance and function for that specified thing, taking into account warranty, performance, weight, size, visual effect, specific features and requirements indicated, quality, workmanship, economy of operation, durability, and suitability for purposes intended, provided that the proposed equivalent would not require or constitute a change in Contract work.

HIGHWAY: A general term denoting a public way used for vehicular travel. When referred to in the Contract, it signifies the whole right of way reserved for or secured by the Department for use in constructing or maintaining a roadway and its appurtenances.

INSPECTOR: A duly-authorized representative of the Engineer, assigned to make inspections of the work performed and materials furnished by the Contractor.

LABORATORY: Unless another laboratory or type of laboratory is indicated, the official testing laboratory of the Department.

LIQUIDATED DAMAGES: The amount prescribed in the Contract specifications, to be paid to the State or to be deducted from any payments due or to become due the Contractor, for a specified time unit delay in completing the whole or any specified portion of the work beyond the time allowed in the Contract.

MAJOR ITEM: An individual Contract item, whose value at the time of bidding (either lump sum price or the product of its unit price multiplied by its estimated quantity) is equal to or greater than 10% of the total original Contract bid price shall be considered a Major Item.

MAJOR LUMP SUM ITEM (MLSI): The original Contract item(s) that includes all work depicted on the Contract Plans, described in the Contract Specifications, or is otherwise required for performance and completion of the work, including mobilization and project closeout, but not including any unit price or other lump sum items listed in the Bid Proposal Form.

MANAGER OF CONTRACTS: The Transportation Manager of Contracts, who is the head of the Department's Division of Contracts, and whose office is located at the headquarters of the Department at 2800 Berlin Turnpike, Newington, CT.

MATERIAL: Any substance specified in the Contract for use in the construction of the Project, including appurtenances of products that are substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the work.

MINOR ITEM: An individual Contract item that is not a Major Item.

MUNICIPALITY: City, town or county.

NOTICE TO PROCEED: A written notice issued by the Engineer to the Contractor stating the date on which the Contractor is authorized to commence and proceed with the Contract work.

OWNER: Where used herein, it is synonymous with Department or State.

PAVEMENT STRUCTURE: The combination of sub-base, base course and surface course placed on

subgrade to support and distribute the traffic load.

PLANS: All drawings or reproductions of drawings supplied by the Department to the Contractor pertaining to the construction or details of the Project.

A. Standard Sheets – Standardized plans containing details approved by the Department and the

FHWA, for construction of a given type on any project, included in contracts on an as-needed basis.

PRODUCT DATA (CATALOG CUT): Document(s) with information such as manufacturer's product specifications, manufacturer's installation instructions, standard color charts, wiring diagrams showing factory-installed wiring, printed performance curves and operational range diagrams. Product data that must be specially prepared because standard printed data is not suitable shall be considered shop drawings.

PROJECT: All work included under one Department contract, notwithstanding the occasional use by the Department of multiple project numbers for the work included within one contract.

PROJECT SITE (or SITE): The space available to the Contractor, under the Contract, for performing construction activities. The extent of the Project site is as indicated on the plans or elsewhere in the Contract.

QUALIFIED PRODUCTS LIST (QPL): A report that has been developed as a means for determining what products, suppliers, manufacturers, equipment and methodologies may be used on construction projects. This report can be located on the CT Department of Transportation Website:

[Connecticut DOT Qualified Products List Report](#)

RECLAIMED CONCRETE AGGREGATE: Reclaimed waste consisting of crushed and graded concrete removed from pavements, structures, or buildings. Metal may be acceptable only where it is contained as reinforcement within small fragments of concrete; *e.g.*, metal projecting from concrete fragments would be unacceptable. All such material trucked from beyond the limits of the Project must be accompanied by a Materials Certificate and Certified Test Report indicating that the material is environmentally acceptable and structurally sound in accordance with 1.20-1.06.07, unless the source of the material is a Department Project and that source is acceptable to the Engineer.

RECLAIMED MISCELLANEOUS AGGREGATE: Glass-free and clinker-free reclaimed waste, which has been crushed, graded and blended, as specified in the Contract, with natural crushed stone or gravel. Metal may be acceptable only where it is contained as reinforcement within small fragments of concrete; *e.g.*, metal projecting from concrete fragments would be unacceptable. All such material trucked from beyond the limits of the Project must be accompanied by a Materials Certificate and Certified Test Report indicating that the material is environmentally acceptable and structurally sound in accordance with 1.20-1.06.07, unless the source of the material is a Department Project and that source is acceptable to the Engineer.

RECLAIMED WASTE: Debris from the demolition of buildings, structures, and pavements; residue from incineration and recycled glass. Acceptable material shall include concrete, bituminous concrete, glass, ceramics, brick, pavement sub-base and base courses, and clinker from resource recovery plants. Metal may be acceptable only when it is contained within large fragments of concrete. Reclaimed waste trucked from beyond the limits of the Project must be accompanied by a Materials Certificate and Certified Test Report indicating that the waste is environmentally acceptable and structurally sound in accordance with 1.20-1.06.07, unless the source of the material is a Department Project and that source is acceptable to the Engineer.

RIGHT-OF-WAY: A general term denoting land, property of interest therein, usually in a strip, acquired for or devoted to transportation purposes.

ROADBED: The graded portion of a highway, including portions within the top and side slopes, which have been prepared as a foundation for the pavement structure and shoulders.

ROADWAY: The portion of the highway, including shoulders, which may be used for vehicular travel within the Project limits.

SHOP DRAWINGS: Drawings, including proposed details, diagrams, schedules, procedures and other supporting data, prepared by a Contractor to supplement the Contract documents, showing all information necessary for fabrication of items for which some specific design or detail appears in the Contract.

SHOULDER: The portion of the roadway adjacent to the traveled way, that can accommodate stopped vehicles for emergency use, and that provides lateral support of base and surface courses.

SPECIFICATIONS: The Department's written provisions and requirements for the performance of the Contract, contained in or incorporated by the Contract.

A. *Standard Specifications*—A set of specifications approved by the Department for general application and repetitive use, entitled the "[Standard Specifications for Roads, Bridges, Facilities and Incidental Construction](#)."

B. *Supplemental Specifications*—Approved additions to and revisions of the Standard Specifications.

C. *Special Provisions*—Other Department specifications applicable to an individual project.

STATE: State of Connecticut.

SUBCONTRACTOR: Any individual, firm, partnership or corporation to which the Contractor sublets, with the approval of the Commissioner, any part or parts of the Project covered by the Contract.

SUBSTANTIAL COMPLETION: The date at which the performance of all work on the Project has been completed except minor or incidental items, final cleanup, work required under a warranty, and repair of unacceptable work, and provided the Engineer has determined that:

- A. The Project is safe and convenient for use by the public, and
- B. All traffic lanes including all safety appurtenances are in their final configuration, and
- C. Failure to complete the work and repairs excepted above does not result in the deterioration of other completed work, and provided further, that the value of work remaining to be performed, and cleanup is less than 1% of the estimated final Contract amount, and
- D. A Certificate of Compliance has been issued.

SUBSTITUTE: A replacement for a specified material, device, type of equipment, or method, which is sufficiently different in substance and function, quality, or workmanship to constitute a change in the Contract work.

SUBSTRUCTURE: All of that part of the bridge below the bearings of simple and continuous spans, skewbacks of arches and tops of footings of rigid frames, including backwalls, wingwalls and any protective railings mounted on the wingwalls.

SUB-SUBCONTRACTOR: Any individual, firm, partnership or corporation to which a subcontractor sublets, with the approval of the Commissioner, any part or parts of the Project covered by the Contract.

SUPERSTRUCTURE: The entire bridge except the substructure.

UTILITY: Any public service company and the plant of such a company or similar facilities. Such companies may consist of, but not be limited to, companies selling or controlling the sale, distribution or use of water, gas, electricity, communications systems, sewers and railroad lines. Such facilities may consist of, but not be limited to, wires, cables, ducts, pipes, manholes, transformers, poles, towers and tracks.

WORK: The provision of labor, materials or services necessary for or relating to the design and construction of the Project.

WORKING DRAWINGS: Drawings, calculations, procedures and other supporting data prepared by a Contractor, documenting the Contractor's proposed design, details, materials, construction methods and equipment for any construction for which no specific design or detail appears in the Contract.

1.20-1.01.02—Facilities Construction - Abbreviations, Publications and Standards: For publications and standards, the edition governing the work will be the edition in effect on the date the Contract was advertised for solicitation of bids. Whenever one of the following abbreviations is used in the Contract, its meaning shall be interpreted as follows:

AA—(The) Aluminum Association, Inc.

AABC—Associated Air Balance Council

AAMA—American Architectural Manufacturers Association

AAN—American Association of Nurserymen

AAPA—American Association of Port Authorities

AASHTO—American Association of State Highway and Transportation Officials

NOTE: Wherever reference is made to an AASHTO Standard Method of Test or Standard

Specification, it refers by letter and number to the method or specification published by AASHTO in the "Standard Specifications for Transportation Materials and Methods of Sampling and Testing."

ABMA—American Bearing Manufacturers Association

ACGIH—American Council of Government Industrial Hygienists

ACI—ACI International (American Concrete Institute)

ADAAG—Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities

ADSC—The International Association of Foundation Drilling (formerly Association of Drilled Shaft Contractors)

AF&PA—American Forest & Paper Association

AGA—American Gas Association

AGC—(The) Associated General Contractors of America

AHA—American Hardboard Association

AHAM—Association of Home Appliance Manufacturers

AI—Asphalt Institute

AIA—(The) American Institute of Architects

AISC—American Institute of Steel Construction

AISI—American Iron and Steel Institute

AITC—American Institute of Timber Construction

A.L.I.—Automotive Lift Institute

ALSC—American Lumber Standard Committee, Incorporated

AMCA—Air Movement and Control Association International, Inc.

AMRL—AASHTO Materials Reference Library

ANLA—American Nursery and Landscape Association

ANSI—American National Standards Institute

AOAC—AOAC International

AOSA—Association of Official Seed Analysts

APA—APA-The Engineered Wood Association

API—American Petroleum Institute

AREMA—American Railway Engineering and Maintenance-of-Way Association

ARI—Air-Conditioning & Refrigeration Institute

ARTBA—American Road and Transportation Builders Association

ASA—Acoustical Society of America

ASC—Adhesive and Sealant Council

ASCE—American Society of Civil Engineers

ASHRAE—American Society of Heating, Refrigerating and Air-Conditioning Engineers

ASME—ASME International (The American Society of Mechanical Engineers International)

ASNT—American Society for Non-Destructive Testing

ASSE—American Society of Sanitary Engineering

ASTM—American Society of Testing and Materials (ASTM International)

NOTE: Wherever reference is made to an ASTM specification, test method, or practice, it refers by letter, number, or both to standards published by ASTM International in the "ASTM Standards Source™ Database."

ATSSA—American Traffic Safety Services Association

AWI—Architectural Woodwork Institute

AWPA—American Wood Protection Association (*formerly* American Wood-Preservers' Association)

AWPI—American Wood Preservers Institute

AWS—American Welding Society

NOTE: Wherever reference is made to an AWS materials specification, inspection methods, or welding procedures, it refers by section number to standards of the American Welding Society published in the applicable steel, or aluminum welding code.

AWWA—American Water Works Association

BHMA—Builders Hardware Manufacturers Association

BIA—(The) Brick Industry Association

CBM—Certified Ballast Manufacturers Association

CCRL—Cement and Concrete Reference Laboratory

CDA—Copper Development Association (The)

CGA—Compressed Gas Association

CISCA—Ceilings and Interior Systems Construction Association

CLFMI—Chain Link Fence Manufacturers Institute

ConnDOT—Connecticut Department of Transportation

CFR—Code of Federal Regulations

CGS—Connecticut General Statutes (as revised)

CISPI—Cast Iron Soil Pipe Institute

CRI—(The) Carpet and Rug Institute

CRSI—Concrete Reinforcing Steel Institute

CSI—(The) Construction Specifications Institute

CSSB—Cedar Shake & Shingle Bureau

CTDOT—Connecticut Department of Transportation

CTI—Cooling Technology Institute

DASMA—Door and Access Systems Manufacturers Association, International

DEEP—Connecticut Department of Energy and Environmental Protection

~~DEP—Connecticut Department of Environmental Protection~~ *see* DEEP

DHI—Door and Hardware Institute

DOD—Department of Defense Military Specifications and Standards

~~DPUC—Department of Public Utility Control~~ *see* PURA

EIA—Electronic Industries Alliance

EPA—Environmental Protection Agency

FAA—Federal Aviation Administration

FCC—Federal Communications Commission

FCICA—Floor Covering Installation Contractors Association

FHWA—Federal Highway Administration

FMG—FM Global

FRA—Federal Railway Administration

FS—Federal Specification

NOTE: Wherever reference is made to FS in the contract, it refers by number, letter, or both, to the latest standard or tentative standard of the Federal Specification Unit, General Services Administration, Federal Supply Service, as to materials, specifications, or methods of testing, whichever the case may be.

FTA—Federal Transit Administration

GA—Gypsum Association

GANA—Glass Association of North America

GSA—General Services Administration

HI—Hydraulics Institute

HPVA—Hardwood Plywood & Veneer Association

ICC—International Code Council

ICC-ES—ICC Evaluation Service, Inc.

ICEA—Insulated Cable Engineers Association, Inc.

ICRI—International Concrete Repair Institute

IEC—International Electrotechnical Commission

IEEE—(The) Institute of Electrical and Electronics Engineers, Inc.

IES—Illuminating Engineers Society

IESNA—Illuminating Engineering Society of North America

IGCC—Insulating Glass Certification Council

IGMA—Insulating Glass Manufacturers Alliance

IMSA—International Municipal Signal Association

IRI—HSB Industrial Risk Insurers

ISO—International Organization for Standardization

ITE—Institute of Traffic Engineers

KCMA—Kitchen Cabinet Manufacturers Association

LMA—Laminating Materials Association

LPI—Lightning Protection Institute

MASH—Manual for Assessing Safety Hardware

MBMA—Metal Building Manufacturers Association

MILSPEC—Military Specification and Standards

MMA—Monorail Manufacturers Association

MSHA—Mine Safety and Health Administration

MSS—Manufacturers Standardization Society of The Valve and Fittings Industry, Inc.

MUTCD—Manual on Uniform Traffic Control Devices

NAAMM—National Association of Architectural Metal Manufacturers

NADCA—National Air Duct Cleaners Association

NAIMA—(The) North American Insulation Manufacturers Association

NBFU—National Board of Fire Underwriters

NCHRP—National Cooperative Highway Research Program

NCMA—National Concrete Masonry Association

NCPI—National Clay Pipe Institute

NEBB—Natural Environmental Balancing Bureau

NEC—National Electrical Code

NECA—National Electrical Contractors Association
 NEMA—National Electrical Manufacturers Association
 NEPCOAT—North East Protective Coatings Committee
 NESC—National Electrical Safety Code
 NETA—InterNational Testing Association
 NETTCP—NorthEast Transportation Technician Certification Program
 NFPA—National Fire Protection Association
 NFRC—National Fenestration Rating Council
 NHLA—National Hardwood Lumber Association
 NICET—National Institute for Certification in Engineering Technologies
 NIOSH—National Institute of Occupational Safety and Health
 NIST—National Institute of Standards and Technology
 NLGA—National Lumber Grades Authority
 NOAA—National Oceanic and Atmospheric Administration
 NRCA—National Roofing Contractors Association
 NSBA—National Steel Bridge Alliance
 NSF—NSF International
 NTMA—National Terrazzo and Mosaic Association, Inc.
 OEO—Office of Equal Opportunity
 OSHA—Occupational Safety and Health Administration
 PCA—Portland Cement Association
 PCI—Precast/Prestressed Concrete Institute
 PDI—Plumbing & Drainage Institute
 PTI—Post-Tensioning Institute
 PURA—Public Utilities Regulatory Authority
 RFCI—Resilient Floor Covering Institute
 RMA—Rubber Manufacturers Association
 SAE—SAE International (formerly Society of Automotive Engineers)
 SDI—Steel Deck Institute *or* Steel Door Institute
 SFPA—Southern Forest Products Association
 SHRP—Strategic Highway Research Program
 SJI—Steel Joist Institute
 SMACNA—Sheet Metal and Air Conditioning Contractors National Association
 SPIB—(The) Southern Pine Inspection Bureau
 SPRI—Single Ply Roofing Institute
 SSPC—The Society for Protective Coatings (*formerly* The Steel Structures Painting Council)
 NOTE: Where reference is made to SSPC in the Contract, it refers by number, letter, or both, to the latest standard or tentative standard specification as to materials specifications, methods of testing, systems, procedures, inspection or other specification pertaining to any or all phases of cleaning or painting, whichever may apply.
 SWRI—Sealant, Waterproofing, & Restoration Institute
 TCA—Tile Council of America, Inc.
 TIA—Telecommunications Industry Association
 TIA/EIA—Telecommunications Industry Association/Electronics Industries Alliance
 TPI—Truss Plate Institute, Inc.
 TRB—Transportation Research Board
 UFAS—Uniform Federal Accessibility Standards
 UL—Underwriters Laboratories Inc.
 USDA—United States Department of Agriculture
 USGBC—U.S. Green Building Council
 WCLIB—West Coast Lumber Inspection Bureau
 WCSC—Window Covering Safety Council
 WDMA—Window & Door Manufacturers Association
 WWPA—Western Wood Products Association

1.20-1.01.03—Abbreviations and Terms: Abbreviations and terms used in the Contract are in lieu of and are to be construed in the same way as are the terms or phrases following them in the list below. Those abbreviations and terms include, but are not necessarily limited to:

ABS—acrylonitrile butadiene styrene
 AC—alternating current
 ACCM Pipe or ACCMP—Asphalt-Coated Corrugated Metal Pipe
 ACSR—Aluminum Conductor, Steel Reinforced
 A.E.A.—Air Entraining Admixture
 AIC—Ampere Interrupting Current
 AOEC—Area of Environmental Concern
 APA—Aquifer Protection Area
 AWG—American Wire Gauge
 B & B—balled and burlapped
 bbl—barrel
 BCPC—Bituminous Concrete Park Curbing
 Bit.—bituminous
 Bit. Conc.—bituminous concrete
 CAPWAP—Case Pile Wave Analysis Program
 CAS—Coating Applicator Specialist
 CCA—chromated copper arsenate
 CB—catch basin
 CCM Pipe or CCMP—coated corrugated metal pipe
 CICU—controller interface communications unit
 CLLCU—closed loop local coordination unit
 CLMU—closed loop master unit
 CMS—Changeable Message Sign
 Conc.—concrete
 CPE Pipe or CPEP—corrugated plastic or polyethylene pipe
 CPS—centipoise second
 CUF—Commercially Useful Function
 CWI—Certified Welding Inspector
 cwt.—hundredweight or 100 pounds
 DBE—Disadvantaged Business Enterprise
 DBH—Diameter at breast height
 DC—direct current
 dist.—distillation
 DMT—Division of Materials Testing
 DTI—Direct Tension Indicator
 EW—endwall
 est.—estimated
 exc—excavation
 fi—jacking tension
 FRC—Fiberglass Reinforced Composite
 $f' c$ —specified minimum compressive strength at a specified age
 $f' ci$ —required strength at time of transfer
 ga—gauge or gage
 GFRP—glass fiber reinforced polymer
 Gsa—Apparent specific gravity
 Gsb—Bulk specific gravity
 HASP—Health and Safety Plan
 HMA—hot mix asphalt or bituminous concrete
 HRB—Rockwell B Scale hardness
 HRC—Rockwell C Scale hardness
 Hz—hertz
 IMC—intermediate metal conduit
 IP—internet protocol
 I.P.S.—iron pipe size
 IWRC—independent wire rope core
 JMF—job mix formula
 KD—kiln dried

KDAT—kiln dried after treatment
 kip—1000 pounds
 ksf—kips per square foot
 LCD—Liquid Crystal Display
 LED—light-emitting diode
 LRFD—Load & Resistance Factor Design
 l.s.—lump sum
 mbf—1000-foot board measure
 MBR—metal beam rail
 Mgal—1000 gallons
 MH—manhole
 MLSI—Major Lump Sum Item
 MSDS—Material Safety Data Sheet(s)
 MPT—Maintenance and Protection of Traffic
 N.C.—National Coarse
 NDT—non-destructive testing
 Pavt.—pavement
 PCBC—precast concrete barrier curb
 PCC—Portland Cement Concrete
 PE—polyethylene
 Perf. ACCM Pipe or Perf. ACCMP—Perforated Asphalt-Coated Corrugated Metal Pipe
 Perf. CCM Pipe or Perf. CCMP—Perforated Coated Corrugated Metal Pipe
 Perf. CPE Pipe or Perf. CPEP—Perforated Corrugated Plastic or Polyethylene Pipe
 pfmd.—preformed
 PROM—programmable read only memory
 psf—pounds per square foot
 psi—pounds per square inch
 p/s—prestressed
 PVC—polyvinyl chloride
 Pwa—Percent water absorbed
 QCPFA—Quality Control Plan for Fine Aggregates
 RAP—reclaimed asphalt pavement
 RC—Reinforced Concrete
 RCCE—Reinforced Concrete Culvert End
 RC Pipe *or* RCP—Reinforced Concrete Pipe
 RFC—Request for Change
 RFI—Request for Information
 RMC—Rigid Metal Conduit
 SD—system detector
 SDR—Standard Dimension Ratio (ratio of pipe diameter to wall thickness)
 sec.—second
 sol.—soluble
 sp. gr.—specific gravity
 sp. visc.—specific viscosity
 SSA—Sole Source Aquifer
 SSP—Subspecies
 std.—standard
 surf.—surface
 TDC—Transportation Division Chief
 THHN—Heat resistant thermoplastic, insulated nylon jacket, 90 degrees Centigrade, 600 volt building wire
 THWN—Moisture and heat resistant thermoplastic, insulated nylon jacket, 75 degrees Centigrade, 600 volt building wire
 TL—Test Level
 TMA—Truck Mounted Impact Attenuator
 TMP—Transportation Management Plan
 tsf—tons per square foot
 TTC—Temporary Traffic Control

U'drain *or* Udrain—Underdrain
 UTCS—urban traffic control system
 UNC—Unified National Coarse
 USB—Universal Serial Bus
 UV—ultra-violet or ultra violet light
 VAC—Volts Alternating Current
 VDC—Volts Direct Current
 VMS—Variable Message Sign
 VOC—Volatile Organic Compound
 VT—vitrified tile
 W—watt
 WSA—Temporary Waste Stockpile Area

SECTION 1.20-1.02
PROPOSAL REQUIREMENTS AND CONDITIONS FOR
FACILITIES CONSTRUCTION

Replace Article 1.20-1.02.13 with the following:

1.20-1.02.13—Facilities Construction - Knowledge of Applicable Laws: Bidders shall be deemed to know and understand all federal, state and local laws, ordinances and regulations and municipal bylaws which in any manner apply to projects for which they bid; such legal requirements shall include, but not necessarily be limited to, those which apply to the conduct of the Contract work, the equipment and materials to be used on the Project, or the treatment of individuals or classes of individuals in relationship to their involvement with the Project. A Contractor's ignorance of such requirements shall not, in any internal Department proceeding or in any claims or other legal proceeding, constitute justification for the Contractor's failure to consider such requirements in formulating a bid proposal, or for the Contractor's failure to ensure that such legal requirements are met with regard to any Department project in which that Contractor participates.

The Contractor agrees that if it should be awarded the contract for any project supported at least in part by federal funding, the Contractor will not knowingly enter into any lower-tier transaction on that project with a person (including entities) who, by virtue of federal law or regulation, or by voluntary agreement, is currently ineligible to participate in such a project, unless after disclosure of such ineligibility, such participation is authorized by appropriate federal and State authorities.

The Department expects the Contractor to obey municipal laws and regulations and cooperate with municipal officials. In some instances, however, municipal laws or regulations, or the orders of municipal officials, may conflict with necessary Project activities. In most such cases, the municipality does not have the legal power to enforce its laws and regulations upon the State or upon a State project. This is because the State is protected by its sovereign immunity. If local police or other authorities should attempt to stop the Contractor from carrying out activities that are necessary in order for the Contractor to comply with Contract requirements, the Contractor should politely inform the municipal authorities that they probably do not have jurisdiction over the State's project, and the Contractor should immediately inform the Engineer of the attempted interference with Project activities. If the municipal authorities continue to insist upon preventing the Contractor from carrying out Project activities, the Contractor should not defy the authorities, but, to the extent possible, should await directions from the Engineer.

All work to be performed by the Contractor shall comply with, as a minimum, the State Building Code as adopted pursuant to CGS 29-252, as amended; the State Fire Prevention Code as adopted pursuant to CGS 29-291a, as amended; and the Fire Safety Code as adopted pursuant to CGS 29-292, as amended.

The State Building Code, including latest Connecticut Supplements and Amendments, includes the following:

1. The 2012 International Building Code.
2. The 2012 International Plumbing Code.
3. The 2012 International Mechanical Code.
4. The 2012 International Existing Building Code.
5. The 2012 International Energy Conservation Code.
6. The 2014 NFPA 70 National Electrical Code.
7. The 2009 ICC/ANSI A117.1.

The State Fire Safety Code, including latest Connecticut Supplements and Amendments, includes the

following:

1. The 2012 International Fire Code.
2. The 2012 NFPA 101 Life Safety Code.

The State Fire Prevention Code, including latest Connecticut Supplements and Amendments, includes the following:

1. The 2012 NFPA 1.

The edition of the code governing the Project shall be the code which is in effect as per the above CGS Sections on the date that the Contract is advertised for solicitation of bids.

All work to be performed by the Contractor shall comply with the 2010 Department of Justice “ADA Standards for Accessible Design.”

SECTION 1.20-1.03 AWARD AND EXECUTION OF CONTRACT FOR FACILITIES CONSTRUCTION

Replace the first two paragraphs of Article 1.20-1.03.01 with the following:

1.20-1.03.01—Facilities Construction - Consideration of Bids: See 1.20-1.02.01.

The apparent low bidder shall submit to the Manager of Contracts a Schedule of Values within 7 calendar days after bid opening. Any other Contractor that the Department may subsequently designate as the apparent lowest bidder shall make the aforesaid submission within 7 calendar days from the date on which the Department notifies said Contractor that it has become the apparent lowest bidder. If, however, the Department deems it necessary for such a subsequently designated Contractor to make said submission within a shorter period of time, the Contractor shall make the submission within the time designated by the Department.

In Article 1.20-1.03.07, change the title of subarticle 1 as follows:

1. **Workers’ Compensation Insurance:**

SECTION 1.20-1.04 SCOPE OF WORK FOR FACILITIES CONSTRUCTION

In the list of Articles, change the title of Article 1.20-1.04.02 as follows:

1.20-1.04.02—Facilities Construction - Changes in Quantities of Pay Items, Including Elimination of Such Items

Replace Article 1.20-1.04.01 with the following:

1.20-1.04.01—Facilities Construction - Intent of Contract: The Contract directs and obliges the Contractor to perform the Project described in strict compliance with the Contract terms, including its specifications, plans, special provisions, and other Contract documents. If the Engineer revises any of those terms in writing during the life of the Contract, the Contractor must comply with said revised terms. Among other things, the Contract obliges the Contractor to perform all Project work in conformity with the lines, grades, typical cross-sections, dimensions, and other data shown on the plans or other Contract documents. The Department will pay the Contractor only for work (including materials necessary for that work, whether or not they are incorporated into that work) that the Contractor has actually performed under a Contract pay item, and only if the Engineer has accepted said work. (See 1.20-1.02.03 herein.) (The Contract as it existed when first duly executed by the Engineer is sometimes referred to herein as “the original Contract.”)

Replace Article 1.20-1.04.02 with the following:

1.20-1.04.02—Facilities Construction - Changes in Quantities of Pay Items, Including Elimination of Such Items: The quantities given in the original Contract for Contract pay items are only estimates of the quantities of those items that may be required for Project completion. (The quantities for given pay items in the original Contract are sometimes referred to herein as the “estimated quantities” or “original

quantities.”) A change in the original quantity of a Contract pay item (whether an increase or decrease of the quantity) shall be deemed to have occurred when the Engineer explicitly orders said change of quantity or when the change of quantity has been necessitated by a construction order or other written direction issued by the Engineer to the Contractor.

A Contract pay item shall be deemed a Major Item if the item’s lump sum price in the original Contract, or its original quantity multiplied by its unit price in the original Contract, is equal to or greater than 10% of the original Contract’s total bid price. All other Contract items shall be deemed Minor Items.

The provisions of 1.20-1.04.03 herein shall govern changes in compensation related to a “significant change” in Contract work, (as such changes are defined in 1.20-1.04.03) necessitated by a written order of the Engineer.

The provisions of 1.20-1.04.04 herein shall govern changes in compensation related to any differing site condition encountered by the Contractor that affects its performance of Contract work.

The provisions of 1.20-1.04.03 or 1.20-1.04.04 shall govern in any case in which they conflict with another provision of the Contract.

In any event, if the Engineer and the Contractor together determine that a particular change in compensation to the Contractor should be made due to a change in a Contract pay item quantity (including an item’s complete elimination), they may make that change in compensation by a written agreement to do so.

Changes in Quantities to Minor Items:

(a) Quantity Increases of More Than 25% over Original Quantity: If the actual quantity of work authorized and accepted by the Engineer under a Contract pay item exceeds the item’s original quantity by 25%, the Department will pay for the quantity in excess of 125% of the original quantity in one of the following three ways. (One-time fixed costs for which the Department has already reimbursed the Contractor in paying for 125% of the original quantity shall not be included in a calculation of the actual cost of the excess units.)

- (1) Pay for the aggregate excess units on a cost-plus basis as provided in 1.20-1.09.04.
- (2) Adjust the unit price by the increase or decrease in the unit price for the excess units, said difference to be calculated as of the time when work under the item was completed.
- (3) Pay for the units in any other manner agreed on in writing by the Engineer and the Contractor.

If, however, the aggregate payment for the units in excess of 125% is less than \$25,000 (using the original Contract unit price for the calculation) the Engineer will not adjust that unit price.

(b) Quantity Decreases of More Than 25% below Original Quantity: If the actual quantity of a Contract pay item authorized and accepted by the Engineer is less than 75% of the item’s original quantity, the Engineer will not adjust the original Contract unit price for said item unless the Contractor makes a written request to the Engineer for such an adjustment and the Engineer grants it in writing. If the Engineer grants such a request, the Engineer will adjust the price for each accepted unit of said item performed or provided in one of the following three ways:

- (1) Pay for the total item units actually performed or provided in the aggregate units on a cost-plus basis as provided in 1.20-1.09.04.
- (2) Adjust the unit price by any increase in the unit price for the deficit units, which shall be the difference between the original Contract unit price and the actual unit cost (calculated on a cost-plus basis as provided in 1.20-1.09.04) of the total units performed or provided, said difference to be calculated as of the time when work under the item was completed.
- (3) Pay for the item units performed or provided in any manner agreed on in writing by the Engineer and the Contractor.

In no instance however, shall the unit price paid for the number of units performed or provided, when their quantity has been decreased by more than 25% of the original quantity, be less than their original unit price; and in no instance shall the aggregate payment for such a decreased quantity of items be more than the Engineer would have paid for the performance or provision of 75% of the original quantity at the original unit price.

Regarding treatment of eliminated Contract items, refer to 1.20-1.09.05 herein.

Replace Article 1.20-1.04.03 with the following:

1.20-1.04.03—Facilities Construction - Changes in Quantities and Significant Changes in the Character of Work:

- (i) The Engineer reserves the right to make, in writing, at any time during the work, such changes in

- quantities and such alterations in the work as are necessary to satisfactorily complete the project. Such changes in quantities and alterations shall not invalidate the contract nor release the surety, and the Contractor agrees to perform the work as altered.
- (ii) If the alterations or changes in quantities significantly change the character of the work under the Contract, whether such alterations or changes are in themselves significant changes to the character of the work or by affecting other work cause such other work to become significantly different in character, an adjustment, excluding loss of anticipated profits, will be made to the Contract. The basis for the adjustment shall be agreed upon prior to the performance of the work. If a basis cannot be agreed upon, then an adjustment will be made either for or against the Contractor in such amount as the Engineer may determine to be fair and equitable.
 - (iii) If the alterations or changes in quantities do not significantly change the character of the work to be performed under the Contract, the altered work will be paid for as provided elsewhere in the Contract.
 - (iv) The term "significant change" shall be construed to apply only to the following circumstances:
 - (A) When the character of the work as altered differs materially in kind or nature from that involved or included in the original proposed construction or
 - (B) When a Major Item of work, as defined elsewhere in the Contract, is increased in excess of 125% or decreased below 75% of the original Contract quantity. Any allowance for an increase in quantity shall apply only to that portion in excess of 125% of original Contract item quantity, or in case of a decrease below 75%, to the actual amount of work performed

Replace Article 1.20-1.04.04 with the following:

1.20-1.04.04—Facilities Construction - Differing Site Conditions:

- (i) During the progress of the work, if subsurface or latent physical conditions are encountered at the Site differing materially from those indicated in the Contract or if unknown physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the work provided for in the Contract, are encountered at the Site, the party discovering such conditions shall promptly notify the other party in writing of the specific differing conditions before the Site is disturbed and before the affected work is performed.
- (ii) Upon written notification, the Engineer will investigate the conditions, and if it is determined that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the Contract, an adjustment, excluding loss of anticipated profits, will be made and the Contract modified in writing accordingly. The Engineer will notify the Contractor of his/her determination whether or not an adjustment of the Contract is warranted.
- (iii) No Contract adjustment which results in a benefit to the Contractor will be allowed unless the Contractor has provided the required written notice.
- (iv) No Contract adjustment will be allowed under this clause for any effects caused on unchanged work.

Replace Article 1.20-1.04.05 with the following:

1.20-1.04.05—Facilities Construction - Extra Work: Unforeseen work made necessary by the Engineer's changes of the Contract plans or specifications, or work that is necessary for completion of the Project, but for which no price is provided in the Contract, shall be done in accordance with the requirements of the specifications and as directed by the Engineer. The Engineer shall notify the Contractor of the necessity for such extra work, stipulating its character and extent, and shall notify the Contractor as to whether the Engineer wants the Contractor to propose a unit price or, lump sum price, or to perform the extra work on a cost-plus basis in accordance with 1.20-1.09.04. The Engineer need not solicit any price for the extra work from the Contractor, but may, in any event, simply order the Contractor to perform the extra work on a cost-plus basis. If the Engineer does solicit from the Contractor a unit or lump sum price for the extra work, the Contractor must propose such a price in writing within 5 days of the Engineer's request for one.

The Contractor's price proposal shall be itemized and reasonably detailed, and shall include all known or anticipated direct and indirect costs of the work, including but not limited to, the costs of all safety and other equipment, small tools, labor, subcontractor quotes, consumables, field office overhead, home office overhead, insurance, bonding, and profit.

The character and extent of the extra work, together with the basis of compensation, shall be

communicated to the Contractor by means of a construction order which, when signed by the Engineer, shall become a part of the Contract. If a Contractor objects to any portion of a construction order submitted to it, the Contractor must, within 15 days of its receipt of said order, return the order with a letter to the Department's Assistant District Engineer administering the Contract, describing specifically what portions of the order the Contractor finds objectionable, the nature of its objections, and the bases for its objections. If the Contractor does not do so, it shall be deemed to have accepted the terms of the construction order.

If the Engineer changes the scope of Contract work, the Contractor shall submit a proposed revised schedule and a cost revision proposal, which takes all such changes into account, if the Contractor believes that such revisions are warranted. If the schedule is to be revised, it will be revised in accordance with 1.20-1.08.08.

SECTION 1.20-1.05 CONTROL OF THE WORK FOR FACILITIES CONSTRUCTION

In the list of Articles, change the titles of Articles 1.20-1.05.03 and 1.20-1.05.14 as follows:

1.20-1.05.03—Facilities Construction - Conformity with Plans and Specifications (including Quality Control)

1.20-1.05.14—Facilities Construction - Termination for Convenience

Replace Article 1.20-1.05.02 with the following:

1.20-1.05.02—Facilities Construction - Contractor Submittals:

1. General: Vacant

2. Submittal Preparation and Processing: Vacant

3. Transmittal of Submittals: Vacant

4. Submittal Schedule: At the Pre-Construction Meeting, the Contractor shall submit the initial submittal schedule. The initial submittal schedule will include all submittals required during the first 60 calendar days of construction, all submittals required to maintain orderly progress of the Work, and all submittal required early because of long lead time for manufacture or fabrication.

Following the Engineer's response to the initial submittal, the Contractor shall provide copies of the schedule to the Engineer, Designer, the Contractor's subcontractors, and other parties required to comply with submittal dates indicated.

The Contractor shall submit the complete submittal schedule within 60 calendar days of the Notice to Proceed.

The Contractor shall update its submittal schedule once a month and distribute and post each updated schedule in the manner described above.

The submittal schedule shall be organized in numerical order by special provision number and by CSI-formatted specification section number. The Contractor shall include (1) time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates; and (2) additional time required for making corrections or revisions to submittals noted by Designer or Engineer and additional time for handling and reviewing submittals required by those corrections. The Contractor shall coordinate submittal schedule with its subcontractors, the schedule of values, and their construction schedule.

5. Working Drawings (Delegated Design Submittals): When required by the Contract, or when ordered to do so by the Engineer, the Contractor shall prepare and submit working drawings, signed, sealed and dated by a qualified Professional Engineer licensed to practice in the State of Connecticut, for review.

There will be no direct payment for furnishing any working drawings, procedures or supporting calculations, but the cost thereof shall be considered as included in the general cost of the work.

- a. Working Drawings for Permanent Construction: The Contractor shall submit drawings to the Designer on 22 inch × 34 inch sheets with a border and title block similar to the Department standard. Each drawing shall be a separate PDF file. Drawings shall be searchable. The first drawing shall include the Contractor's designer's Professional Engineer's digital signature, meeting the requirements of Adobe's Certified Document Services (CDS), and all other drawings shall include a watermark of the Professional Engineer's stamp in a common area of the border. Calculations, procedures and other supporting data may be submitted in an 8-1/2 inch × 11 inch format and shall be in a single PDF file. The first sheet of calculations shall include the Contractor's designer's Professional Engineer's digital

signature, meeting the CDS requirements. Documents shall be named "Drawings," "Calculations," or "Supporting Documentation" as applicable.

The Contractor's designer, who prepares the working drawings, shall secure and maintain at no direct cost to the State a Professional Liability Insurance Policy for errors and omissions in the minimum amount of \$2,000,000 per error or omission. The Contractor's designer may elect to obtain a policy containing a maximum \$250,000 deductible clause, but if the Contractor's designer should obtain a policy containing such a clause, they shall be liable to the extent of at least the deductible amount. The Contractor's designer shall obtain the appropriate and proper endorsement of its Professional Liability Policy to cover the indemnification clause in this Contract, as the same relates to negligent acts, errors or omissions in the Project work performed by them. The Contractor's designer shall continue this liability insurance coverage for a period of

(i) 3 years from the date of acceptance of the work by the Engineer, as evidenced by a State of Connecticut, Department of Transportation form entitled "Certificate of Acceptance of Work," issued to the Contractor; or

(ii) 3 years after the termination of the Contract, whichever is earlier, subject to the continued commercial availability of such insurance.

The Contractor shall supply to the Assistant District Engineer a certificate of insurance in accordance with 1.20-1.03.07 at the time that the working drawings for the Project are submitted.

- b. Working Drawings for Temporary Construction: The Contractor shall submit drawings, calculations, procedures and other supporting data in a format acceptable to the Assistant District Engineer.
- c. Working Drawings for Permanent Construction: Drawings shall be submitted to the Designer on 22 inch × 34 inch sheets with a border and title block similar to the Department standard. Each drawing shall be a separate PDF file. Drawings shall be searchable. The first drawing shall include the Contractor's designer's Professional Engineer's digital signature, meeting the requirements of Adobe's Certified Document Services (CDS), and all other drawings shall include a watermark of the Professional Engineer's stamp in a common area of the border. Calculations, procedures and other supporting data may be submitted in an 8 1/2 inch × 11 inch format and shall be in a single PDF file. The first sheet of calculations shall include the Contractor's designer's Professional Engineer's digital signature, meeting the CDS requirements. Documents shall be named "Drawings," "Calculations," or "Supporting Documentation" as applicable.

6. Shop Drawings: When required by the Contract, or when ordered to do so by the Engineer, the Contractor shall prepare and submit shop drawings for review. Drawings shall be submitted on 22 inch × 34 inch sheets with an appropriate border and with a title block in the lower right-hand corner of each sheet. Each drawing shall be a separate PDF file. Drawings shall be searchable.

Shop Drawings consist of fabrication and installation drawings, roughing-in and setting drawings, schedules, patterns, templates and similar drawings, and wiring diagrams showing field-installed wiring, including power, signal, and control wiring. Standard information prepared without specific reference to the Project shall not be considered to be a Shop Drawing. Shop Drawings shall be project specific.

Shop drawings shall include the following information: Contract number, Project description, number and title of the drawing, date of drawing, revision number, name of Contractor and subcontractor submitting drawings, dimensions, identification of products, shop work manufacturing instructions, design calculations, statement of compliance with Contractual standards, notation of dimensions established by field measurement, notation of coordination requirements, relationship to adjoining construction clearly indicated, seal and signature of a professional engineer if specified, and any other information required by individual Contract provisions.

There will be no direct payment for furnishing any shop drawings, procedures or supporting calculations, but the cost thereof shall be considered as included in the general cost of the work.

7. Coordination Drawings: When required by the Contract, or when ordered to do so by the Engineer, the Contractor shall prepare and submit coordination drawings for review. Each drawing shall be a separate PDF file. Drawings shall be searchable.

The Contractor shall prepare coordination drawings according to requirements in other Contract provisions, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

Coordination Drawings shall include Project-specific information drawn accurately to a scale large enough to indicate and resolve conflicts. Coordination Drawings shall not be based on standard printed data. Coordination Drawings shall include the following information, as applicable:

- (1) use applicable plans as a basis for preparation of Coordination Drawings and prepare sections, elevations, and details as needed to describe relationship of various systems and components;
- (2) coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review;
- (3) indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems;
- (4) indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation;
- (5) show location and size of access doors required for access to concealed dampers, valves, and other controls;
- (6) indicate required installation sequences;
- (7) indicate dimensions shown on the plans, specifically noting dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements, and
- (8) provide alternate sketches to the Designer indicating proposed resolution of such conflicts.

The Contractor shall ensure the Coordination Drawings are signed by each installer, indicating their approval prior to submission.

There will be no direct payment for furnishing any coordination drawings, but the cost thereof shall be considered as included in the general cost of the work.

8. Product Data: When required by the Contract, or when ordered to do so by the Engineer, the Contractor shall prepare and submit product data for review in a PDF file.

The Contractor shall provide all product data in a single submittal for each element of construction or system and shall mark each submittal with the Contract item number.

The Contractor shall mark each copy of a product data submittal to show applicable choices and options. Where product data includes information on several products that are not required, copies shall be marked to indicate the applicable information. Product data shall include the following information and confirmations to the extent applicable: manufacturer's printed recommendations, compliance with recognized trade association standards, compliance with recognized testing agency standards, application of testing agency labels and seals, notation of coordination requirements, and any other information required by the individual Contract provisions.

There will be no direct payment for furnishing any product data, but the cost thereof shall be considered as included in the general cost of the work.

9. Product Samples: When required by the Contract, or when ordered to do so by the Engineer, the Contractor shall prepare and submit product samples for review.

Product Samples are samples submitted for review and action by the Designer, which are:

- (1) physically identical to the proposed product or material cured and finished as required by the Contract; or
- (2) submitted for review of kind, color, pattern, thickness, and texture.

Samples shall be used for a final check of these characteristics with other elements, and for a comparison of the characteristics of the approved sample with those of the actual component as delivered and installed.

The following information shall be submitted with product samples to the extent applicable: Contract number; Project description; generic description of the sample (name or trade reference, type or quality or grade, and any further designation necessary to identify the items or materials); sample source; product name; manufacturer's name; confirmation of availability; and anticipated delivery time.

In conjunction with the submission of physical product samples, a digital photograph of the sample shall be uploaded into ProjectWise.

The Designer will retain one set of the samples, transmit one set of same to the Engineer, and transmit any remaining sets of samples to the Contractor. The Engineer will retain the samples at the Project site for quality comparisons throughout the duration of the Project.

There will be no direct payment for furnishing any product samples, but the cost thereof shall be considered as included in the general cost of the work.

10. Quality Assurance Submittals: When required by the Contract, or when ordered to do so by the Engineer, the Contractor shall prepare and submit quality assurance submittals for review in a PDF file. Quality assurance submittals consist of qualification data, design data, certifications, manufacturer's

instructions, manufacturer's field reports, test reports, Material Safety Data Sheets (MSDSs), and other quality assurance information required by individual Contract provisions.

Where Contract provisions require certification that a product, material, or installation complies with specified requirements, the Contractor shall submit a notarized certification from the manufacturer certifying said compliance. An officer of the manufacturer or other individual authorized to sign documents on behalf of the company shall sign the certification.

Where Contract provisions require the Contractor shall provide a certification letter on the manufacturer's letterhead to certify that asbestos is not contained in the materials. The manufacturer certification letter shall be formatted in the following manner:

[Addressed to:]	Commissioner of Transportation Department of Transportation P.O. Box 317546 Newington, Connecticut 06131-7546
Project Title and Number	
[We] hereby certify that all materials manufactured by [Insert Manufacturer Name] are asbestos-free.	
[Signature:]	[Name of authorized signatory] [Title]

Submittals associated with these materials will not be reviewed without the required manufacturer certification letter.

There will be no direct payment for furnishing any quality assurance submittals, but the cost thereof shall be considered as included in the general cost of the work.

11. Submittal Reviewer's Action: The Designer or Engineer will review each submittal, mark each with a uniform, self-explanatory action stamp, and return the stamped submittal promptly to the Contractor. The stamp will be marked as follows to indicate the action taken:

- (a) If submittals are marked "No Exceptions Noted," the Designer or Engineer has not observed any statement or feature that appears to deviate from the Contract requirements. This disposition is contingent on being able to execute the manufacturer's written warranty in compliance with the Contract provisions.
- (b) If submittals are marked "Exceptions as Noted," the considerations or changes noted by the Designer or Engineer are necessary in order for the submittal to comply with Contract requirements. This disposition is contingent on being able to execute the manufacturer's written warranty in compliance with the Contract provisions.
- (c) If submittals are marked "Revise and Resubmit," the Contractor shall revise and resubmit the submittal to address the deficiencies or provide additional information requested by the Designer or Engineer
- (d) If submittals are marked "Rejected," the Contractor shall prepare and submit a new submittal in accordance with the Designer's notations.
- (e) If submittals are primarily for information or record purposes, the Designer will return the submittal marked "No Action Required." This disposition is contingent on being able to execute the manufacturer's written warranty in compliance with the Contract provisions.

Upon completion of the review, the submittal reviewer will notify the Contractor by e-mail that the submittal dispositions are available in ProjectWise.

The Contractor shall not proceed with the part of the Project covered by the submittal until the submittal is marked "No Exceptions Noted" or "Exceptions as Noted" by the Designer or the Engineer. The Contractor shall retain sole responsibility for compliance with all Contract requirements.

The Contractor shall print 2 color copies through ProjectWise of each submittal marked "No Exceptions Noted" or "Exceptions as Noted" to the Assistant District Engineer for use by the Engineer within 7 calendar days of the Contractor's receipt of the submittal reviewer's e-mail. The Contractor shall not perform physical work related to the submittal until the 2 color copies are provided to the Assistant District Engineer.

The Contractor shall mark up one set of Working Drawings (including any related calculations), Shop Drawings, and Coordination Drawings and retain them as a "Record Document."

Maintenance manuals and warranties will not be returned unless they are Rejected.

Replace Article 1.20-1.05.03 with the following:

1.20-1.05.03—Facilities Construction - Conformity with Plans and Specifications (including Quality Control): The Contractor shall perform all work and provide all materials in conformity with the lines, grades, cross-sections, dimensions and material requirements, including tolerances, shown on the plans or indicated in the Contract specifications, or as directed by the Engineer.

The minimum quantity or quality level to be provided or performed is shown or specified in the Contract. The actual installation may comply exactly with the minimum quantity or quality specified or it may exceed the minimum within reasonable limits. Indicated numeric values are minimum or maximum, as appropriate for the context of the requirements. The Contractor shall refer uncertainties to the Engineer for a decision before proceeding.

If the Engineer believes that the materials or the finished product in which the materials were used are not in conformity with the plans and specifications, but believes nonetheless that the finished product is acceptable, he will then determine whether or not the work will be accepted and remain in place. If the Engineer believes that the work should be accepted, he will issue a construction order confirming his determination, and may provide therein for any equitable adjustment in the basis of payment which he deems appropriate.

If, in the opinion of the Engineer, any material provided by the Contractor, any finished product in which the materials were used, or any work performed does not conform to the plans and specifications and has resulted in an unacceptable product, the Contractor shall, at its own expense, either cure or remove and replace the unaccepted work and material, as the Engineer directs.

Quality Management Plan: The Contractor shall maintain and implement a written Quality Management Plan (QMP). The QMP shall document the overall internal quality control operating procedures for the Contractor to meet or exceed Contract requirements. The details of the QMP must discuss how the Contractor will ensure that:

- Work processes are performed efficiently and as documented
- Work processes out of conformance are quickly identified
- Corrective action is quickly taken to bring such work processes back into conformance

The QMP must include the following components:

- Identification of Contractor staff and their specific duties and responsibilities with regard to execution of the QMP
- Standard operating procedures and frequency of quality control inspection and testing used to measure quality before, during and after those procedures
- Action plan for reporting and reacting to nonconformance and quality control issues

The Contractor shall furnish a copy of the QMP to the Engineer prior to the start of the work. The Contractor must revise the QMP if, as determined by the Engineer, the Contractor's procedures prove to be inadequate or ineffective in producing work that meets the Contract requirements. Failure of the Contractor to comply with the provisions of this Article may result in a suspension of work in whole or in part. The Department will not grant the Contractor additional Contract time or compensation in connection with such a suspension.

Replace Article 1.20-1.05.05 with the following:

1.20-1.05.05—Facilities Construction – Cooperation by Contractor: The Contractor will be supplied by the Department with copies of the plans.

The Contractor shall maintain in good order, in a secure, fire-resistant location at the Project site, 2 copies of all plans, Special Provisions (including CSI-formatted specifications within a particular Special Provision), Addenda, submittals, Construction Orders, and other modifications, schedules and instructions. Both sets shall be available to the Engineer at all times. The Contractor shall keep one set clean of all markings. The Contractor shall mark one set of these documents to record all changes made during construction. The Contractor shall keep these documents current. The Contractor shall not permanently conceal any work until the required information has been recorded. The Engineer may withhold payments due to the Contractor should they fail to keep these documents current.

Record Drawings: The Contractor shall maintain a complete set of Record Drawings by maintaining a clean, undamaged set of Contract drawings (original Contract plans as modified by Addenda and Construction Orders), Working Drawings (including any related calculations), Shop Drawings, and Coordination Drawings. The Contractor shall mark whichever drawings within the set that is most capable of showing conditions fully and accurately where the actual installation varies substantially from the

Project work as originally shown. The Contractor shall include hyperlinks on the Contract drawings to cross-reference to the related Working Drawings, Shop Drawings, Coordination Drawings, as well as RFIs and RFCs. The Contractor shall give particular attention to concealed elements that would be difficult to measure and record at a later date. The Contractor shall use separate colors to distinguish between variations in separate categories of the Project work.

Record Specifications: The Contractor shall maintain one complete copy of the Record Specifications, including related Addenda, construction orders and modifications issued during construction. The Contractor shall

- (1) mark these documents to show substantial variations in actual Project work performed in comparison with the text of the Specifications and modifications,
- (2) take care to show clearly on these documents any selected options and information on concealed construction that would be difficult to view at a later date,
- (3) note related record drawing information and Product Data.

Record Reports: The Contractor shall maintain one binder of all miscellaneous records such as manufacturer startup reports, test reports, and Building and Fire Code inspection reports required by other Contract Provisions (including CSI-formatted Specifications within a particular Special Provision). The miscellaneous records shall be arranged systematically according to the organization of the Contract provisions.

Record Survey: The Contractor shall submit a Record Survey in accordance with other Contract requirements.

No Asbestos Certification: The Contractor shall complete and sign a certification letter assuring the Department that no asbestos-containing materials have been used in the construction of the Contract. The Department will not issue the Certificate of Compliance without this completed and signed certification form. The Contractor certification letter shall be formatted in the following manner:

**CONTRACTOR CERTIFICATION:
RE/ASBESTOS CONTENT OF MATERIALS**

State of Connecticut
Department of Transportation
PO Box 317546
Newington, CT 06131-7546

1. Project Number: _____
2. Project Name: _____
3. Contractor Name: _____
4. This is to certify that I fully understand that it is the requirement of the Connecticut Department of Transportation that only materials that do not contain asbestos of any kind or amount are to be utilized in the construction of this Project.

I therefore certify that, to the best of my knowledge, all materials installed under this Contract are asbestos-free.

For the one-year warranty period after the issuance of the Certificate of Compliance, I agree to remove any asbestos-containing material identified by the Connecticut Department of Transportation and reinstall an approved, non-asbestos-containing material that is in compliance with the original Contract at no additional cost to the State.

5. Date of Certificate of Compliance: _____
6. Date of the Asbestos Certification: _____
7. Signature of Authorized Party Agreeing to the Terms & Conditions Identified Herein & as Further Stated in the Contract:

_____	_____
Signature	Title
_____	_____
Printed Name	Date

The Contractor shall give the Project constant attention to facilitate the progress thereof, shall cooperate with the Department, and shall promptly comply with all orders and directions of the Engineer.

Project Superintendent: The Contractor shall be represented on Site by a Project Superintendent. The Project Superintendent shall be on the Project Site whenever Project work is being performed. The Project Superintendent shall

- (1) attend all meetings between the Contractor and the Department, the Contractor and its subcontractors, and any other meetings that affect the progress of the Project;
- (2) be knowledgeable of the status of all parts of the work throughout the duration of the Project;
- (3) coordinate the activities of the subcontractors;
- (4) maintain the construction schedule;
- (5) be the Contractor's quality assurance/quality control representative;
- (6) prepare Daily Construction Reports in accordance with 1.20-1.05.08;
- (7) prepare or approve the Biweekly Schedules required to be submitted by the Contractor in 1.20-1.05.08;
- (8) have full authority to promptly execute and carry out the orders and directions of the Engineer within the terms of the Contract; and
- (9) to supply such materials, equipment, tools, labor and incidentals as may be required by the Contract or by the Engineer.

The Project Superintendent shall be an administrative employee of the Contractor or a Consultant hired by the Contractor to coordinate and expedite all phases of the work on a full-time daily basis, including associated project trades, on the Project Site.

The Contractor shall submit a written resume of the proposed Project Superintendent within 7 calendar days of the award of the Contract for the Department's acceptance. This resume shall demonstrate their superintendent work experience on a minimum of 2 projects of this type, scale, and complexity of this Project.

At any time during the Project, the Department may ask for any reason that the Project Superintendent be replaced. If the Department directs this action, the Contractor shall submit a written resume for a new Project Superintendent with the intent that this individual be in place on the Project within 30 calendar days of their acceptance by the Department. During this time, the duties of the Project Superintendent shall be performed by the Project Coordinator. If there is no Project Coordinator on the Project, the Department may allow the original Project Superintendent to remain until the new Project Superintendent begins. The original Project Superintendent may still work on the Project in another capacity at the discretion of the Contractor.

Voluntary Partnering: The Department wants to establish a cohesive partnership with the Contractor and its principal subcontractors on the Project, so that the partnership can draw on the strengths of each organization in order to identify and pursue the partners' mutual Project goals. Chief among those will be the effective and efficient completion of the Project, within budget, on schedule, and in accordance with applicable plans, specifications, and other Contract provisions.

If the Contractor believes at any point before or during Project construction that the creation of formal partnering between itself and the Department, with the use of a third-party facilitator, would help the Contractor and the Department ("Partners") to reach these goals, the Contractor may submit a written request to the District Engineer of the District in which the Project will be constructed for the establishment of formal partnering between the Parties. If the Contractor makes such a request, the Department will engage in that partnering.

Any costs incurred by the Partners jointly in connection with Project partnering activities, to the extent that those costs are recognized as legitimate and appropriate by both Partners, will be shared equally between them. Any other costs incurred because of partnering activities will be borne by the Partner that incurred them.

If the Contractor and the Department decide to pursue a formal partnering initiative, they Contractor and The Department will arrange first to meet in order to select a third-party partnering facilitator and to plan a partnering development and team-building workshop. After they agree upon the services to be performed by the facilitator and the range of compensation for the facilitator that would be acceptable to them, the Contractor will contract accordingly for the services of said facilitator. The Department will reimburse the Contractor for fifty percent (50%) of the payments made under that contract, so long as the activities paid for were appropriate and within the contemplation of the Partners.

At the Partners' initial partnering meeting, the Partners will also determine who should attend the first partnering workshop, what the workshop's agenda will be, how long the workshop should last, and when

and where it will be held. Unless the Partners agree otherwise, attendance at the first partnering workshop will be mandatory for the Department's District Engineer for the Project and the Department's other key Project personnel, the Contractor's on-Site Project manager and other key supervisory Project personnel, and, if the Contractor agrees to it, the key supervisory personnel of the Contractor's principal Project subcontractors. The Partners will also request that the Project design engineers and key local government personnel send Regional/District and Corporate/State-level managers to the workshop and direct them to participate in Project partnering activities as and when requested to do so by the Partners.

With the agreement of the Partners, follow-up Project partnering workshops will be held periodically until the Department closes out the Contract.

If the Partners agree on a formal partnering charter for the Project, the establishment of that charter will not change the legal relationship of the Partners to the Contract; it will not alter, supplement, or eliminate any of the Partners' rights or obligations under the Contract.

Replace Article 1.20-1.05.13 with the following:

1.20-1.05.13—Facilities Construction - Examining and Copying Contractor's Records: The Contractor shall permit the Department and its duly-authorized representatives to examine and copy all documents and other records of the Contractor that are relevant to charges for extra work, alleged breaches of Contract, or any formal or informal claim for additional compensation or for damages in connection with the Project.

With the exception noted below, the Contractor shall also permit the Department to examine and copy such of its documents and other records pertaining to the Project as the Department may deem necessary in order to determine whether or not the Contractor has complied with all laws, regulations and other governmental mandates, e.g., those relating to labor compliance, affirmative action programs, and equal employment opportunity. Documents and other records relating to the Project, if they were created prior to the opening of bids for the Contract, and if they are sought by the Department only for the purpose of confirming such compliance with legal requirements, shall, however, not be subject to examination by the Department pursuant to this Article without the consent of the Contractor.

The Contractor further agrees that it shall keep all documents and other records relating to the Project at least until the expiration of 3 years after the date of acceptance of the Project by the Department, as designated in a "Certificate of Acceptance of Work and Acceptance of Project" issued by the Department. If any claims are brought by the Department or the Contractor prior to that expiration, however, the Contractor shall keep all such records until the Department has given the Contractor a full and final release from all pending and potential claims regarding the Project. If the Contractor does not so keep any such records, it may not assert any formal or informal claim for compensation or damages that could have been substantiated or disproven with such records.

The Contractor shall ensure that the requirements of this provision are made applicable to its subcontractors and suppliers, for the State's benefit, by including the operative language of this Article in its Project subcontracts and purchase agreements.

Replace Article 1.20-1.05.14 with the following:

1.20-1.05.14—Facilities Construction - Termination for Convenience: The State may terminate the Contract whenever the Engineer determines that such termination is in the best interests of the State. Any such termination shall be effected by delivery to the Contractor of a written Notice of Termination specifying the extent to which performance of work under the Contract is terminated and the date upon which said termination shall be effective.

In the case of such a termination, the Department will pay the Contractor at the Contract unit prices for the actual number of units or items of Contract work completed prior to the effective date of termination, or as may be agreed by the parties for such items of work partially completed. No claim for loss of overhead or anticipated profits shall be allowed.

When the volume of work completed is too small to compensate the Contractor under Contract unit prices for its related expenses, the Department may consider reimbursing the Contractor for such expenses.

Materials obtained by the Contractor for the Project, if they have been inspected, tested as required, and accepted by the Engineer, but have not been incorporated into the Project construction, shall, if the Engineer and the Contractor so agree, be purchased by the Department from the Contractor at their actual cost as shown by receipted bills. To this cost shall be added all actual costs for delivery at such points of delivery as may be designated by the Engineer, as shown by actual cost records. If the Engineer does not

agree to purchase such materials, the Department shall reimburse the Contractor for any reasonable restocking fees and handling costs incurred by the Contractor in returning said materials to the vendor.

Termination of the Contract shall not relieve the Contractor of its responsibilities for the completed Project, nor shall it relieve the Contractor's surety of its obligation concerning any claims arising out of the work performed, until the requirements of 1.20-1.08.13 and 1.20-1.08.14 have been met.

**SECTION 1.20-1.06
CONTROL OF MATERIALS FOR
FACILITIES CONSTRUCTION**

Replace Section 1.20-1.06 in its entirety with the following:

**SECTION 1.20-1.06
CONTROL OF MATERIALS FOR
FACILITIES CONSTRUCTION**

1.20-1.06.01—Facilities Construction - Source of Supply, Buy America and Material Quality

1.20-1.06.02—Facilities Construction - Samples and Test

1.20-1.06.03—Facilities Construction - Storage

1.20-1.06.04—Facilities Construction - Defective Materials

1.20-1.06.05—Facilities Construction - Shipping Material

1.20-1.06.06—Facilities Construction - Vacant

1.20-1.06.07—Facilities Construction - Certified Test Reports and Materials Certificates

1.20-1.06.08—Facilities Construction - Warranties

1.20-1.06.25—Facilities Construction- Product Selection

1.20-1.06.01—Facilities Construction - Source of Supply, Buy America and Material Quality:

1. Source of Supply: A source of supply is defined as the original manufacturer of material(s) used within a project. A source of supply may fabricate material(s) such as precast concrete structures or hot mix asphalt from components originally manufactured by others. A broker or distributor of material(s) must not be identified as a source of supply.

The Contractor must notify the Engineer of the proposed source of supply for each of the materials listed on the Anticipated Source of Material (CON-083) Form within 30 days after bid award. Should it become necessary for the Contractor to obtain material from sources other than those indicated in the submitted Anticipated Source of Material (CON-083) Form, the Contractor shall notify the Engineer. The Engineer reserves the right to request additional information regarding such sources.

If, at any time, the Department discovers that materials from a source of supply do not consistently conform to the Contract specifications, the Engineer will notify the Contractor of its nonconformance and that source of supply shall no longer be used for said application.

2. Buy America: All permanently incorporated steel and iron used in the construction of the Project must have been produced and fabricated in the United States. It is the intent of this specification to require that all manufacturing processes for all steel and iron materials and products to be used for the Project, including the coating of steel and iron, occur within the United States, with the following exceptions:

The Contractor may request, in accordance with Section 635.410(b)(4) of Title 23 CFR, approval to include a minimal amount of foreign steel in the Project construction. This amount is defined as 1/10 of 1% of the total Contract price or \$2,500.00, whichever is greater. The cost of the foreign steel or iron is defined as its Contract value when delivered to the Project site.

Additionally, the FHWA has granted a nationwide waiver of the requirements of 23 CFR 635.410, Buy America requirements, for the production of pig iron and processed, pelletized, and reduced iron ore. Items not specifically included in the waiver remain subject to the Buy America requirements. The Contractor may request the Engineer to seek from the FHWA a further waiver of said requirements, but it shall be at the sole discretion of the Engineer whether or not to seek such a waiver.

3. Material Quality: Only materials conforming to the Contract and accepted by the Engineer shall be permanently incorporated into the Project.

Prior to installation, material that is damaged or otherwise changed in a way that it no longer meets Contract specifications shall not be incorporated into the Project.

When one manufacturer's product is specified in the Contract, it shall be understood that this represents the standard required. Unless otherwise stated, a comparable product of another manufacturer may be proposed by the Contractor unless the plans or special provisions indicate that no equal will be allowed. The Contractor shall submit a complete description of the proposed product, together with shop drawings, catalog cuts, product data or other descriptive literature for review in accordance with 1.20-1.05.02. Should a product be designated as an equal, this will not relieve the Contractor from any material testing requirements or a related Certified Test Report and/or Materials Certificate that may be required.

The identification of a manufacturer or fabricator in the Contract does not imply acceptability of products from the named entity. All products must satisfy the Contract criteria for performance, efficiency, materials, and special accessories.

To the fullest extent possible, the Contractor shall provide products of the same kind from a single source. When specified products are available only from sources that do not or cannot produce a quantity adequate to complete Project requirements in a timely manner, the Contractor shall consult with the Engineer to determine the most important product qualities before proceeding. Such qualities may include attributes such as visual appearance, strength, durability, or compatibility. When the Engineer has made such a determination, the Contractor shall select products in accordance with said determination to the fullest extent possible.

With respect to the Project, all products selected by the Contractor must be compatible with its previously selected products.

The Contractor shall place a permanent nameplate on each item of service-connected or power-operated equipment. In occupied spaces, the nameplate shall be located on an easily-accessible but inconspicuous surface. The nameplate shall contain: name of product and manufacturer, model and serial number, capacity, speed, ratings, and other essential operating data.

Except for required labels and operating data, the Contractor shall not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products that will be exposed to view in occupied spaces or on a structure's exterior. The Contractor shall locate required product labels and stamps on concealed surfaces or, if required for observation after installation, on accessible but inconspicuous surfaces.

1.20-1.06.02—Facilities Construction - Samples and Test: The Contractor shall furnish all required samples without charge, and provide secure facilities for their storage. The Contractor shall provide means for, and shall assist in the verification of, all scales, measures and other devices that it operates or uses in connection with the Project. The Contractor shall provide calibration documentation when requested.

The minimum number and size of material samples per Contract item that are required by the Department are listed in the "Minimum Schedule for Acceptance Testing" found in Chapter 8 contained in the [Department's Materials Testing Manual](#). The acceptance methods used to determine compliance with the Contract are also listed. Where applicable, physical testing will be performed in accordance with the test standards which are in effect at the time of bidding, unless otherwise indicated in the Contract. Any item or material not listed in the "Minimum Schedule for Acceptance Testing" or Contract shall be sampled and tested and/or certified, as directed by the Engineer.

Certification may be used as the basis for approval of such materials, as the Contract documents specify or as the Engineer may require. With regard to such materials, the Contractor shall furnish the Engineer a Certified Test Report (CTR) and/or Materials Certificate (MC), in accordance with 1.20-1.06.07 for each type of material, as may be required in the "Minimum Schedule for Acceptance Testing." The Contractor shall bear any costs involved in furnishing the CTR and MC.

If the Contractor has purchased materials for use on a previous Department project, and if they meet the requirements of this Contract, then those materials, with the approval of the Engineer, may be used for the Project provided that the Contractor, acting as the "supplier," submits a related MC meeting the requirements of 1.20-1.06.07. This MC shall further identify the project for which the material was originally purchased and shall be accompanied by a copy of the original MC.

Materials will be rejected by the Engineer whenever, in their judgment, they fail to meet Contract requirements. The Engineer may accept material or the combination of materials and thereby waive noncomplying test results, provided that the following conditions are met:

1. The Engineer finds results of prior and subsequent series of tests of the material or materials from the same source or sources to be satisfactory.
2. The incidence and degree of nonconformance with the Contract requirements are, in the Engineer's judgment, within reasonable limits.
3. The Contractor, in the Engineer's judgment, had diligently exercised material controls consistent with good practices.
4. No adverse effect on the value or serviceability of the completed work could result from said degree of nonconformance.

The Engineer may, in their discretion, waive testing of minor quantities of a particular material if said material was obtained from sources that have furnished supplies of the material that have consistently met Department testing standards.

1.20-1.06.03—Facilities Construction - Storage: The Contractor shall store all materials for the Project in a way that ensures that their quality and fitness for the Project will be preserved, and that the Engineer will have easy and prompt access to them for inspection purposes. Materials shall be kept on wooden

platforms or on other hard, clean surfaces and not on the ground. When so directed by the Engineer, the Contractor shall store materials in a weatherproof building.

The Contractor shall not store materials in any way that would lead to a violation of these specifications including but not limited to 1.20-1.10. Stored materials, even if they have been approved by the Engineer prior to their storage, must be inspected by the Engineer and meet all pertinent Contract requirements immediately prior to use of those materials for the Project.

The Contractor shall

- (1) store products in accordance with the manufacturer's recommendations;
- (2) store products at the Site in a manner that will facilitate inspection and measurement or counting of units;
- (3) store heavy materials away from Project structures so as not to endanger the supporting construction;
- (4) if the products are subject to damage by the elements, store them off the ground, under cover in a weatherproof enclosure, with ventilation adequate to prevent condensation; and
- (5) maintain temperature and humidity within any range recommended by the manufacturer.

Off-site staging and storage of materials and equipment may be required due to restrictive Project Limits and other operational constraints. Arrangement for off-site staging and storage of materials and equipment shall be the responsibility of the Contractor. Payment for off-site staging and storage of materials and equipment shall be in accordance with 1.20-1.09.06.

1.20-1.06.04—Facilities Construction - Defective Materials: Unless otherwise permitted by the Engineer, all materials not meeting Contract requirements shall be considered defective, shall be rejected, and shall be removed immediately from the Project site.

If deemed necessary, the Engineer may require retesting of materials previously tested, accepted and incorporated into the Project. If materials do not meet the Contract requirements after retesting, the Engineer will make a determination whether to allow materials be left in place (with an equitable reduction of payment) or be removed and replaced. No rejected material, the defects of which have been subsequently corrected, shall be used until approval has been given by the Engineer. Should the Contractor fail to comply with these requirements, the Engineer has the authority to order the removal and replacement of defective material and deduct the cost of such removal and replacement from any future payment to the Contractor.

When a material is fabricated or treated with another material, or when any combination of materials is assembled to form a product, any or all of which are covered by the Contract specifications, the failure of any components of the product to meet the requirements of the specifications may be sufficient cause for the rejection of the whole combination or product.

1.20-1.06.05—Facilities Construction - Shipping Material: Any conveyance used for transporting materials must be clean when used, be in proper working condition, have a strong and substantial body that will prevent the loss of materials during transportation, and be approved by the Engineer.

1.20-1.06.06—Facilities Construction - Vacant

1.20-1.06.07—Facilities Construction - Certified Test Reports and Materials Certificates: The Contractor shall furnish the Engineer with any Certified Test Report and Materials Certificate required by the Contract or the "Minimum Schedule for Acceptance Testing" found in Chapter 8 contained in the [Department's Materials Testing Manual](#).

The Contractor shall forward the Certified Test Report and Materials Certificate to the Engineer, and, in addition, shall deliver a copy of same to the Department's inspector at the Site. Materials for which such documentation is required may be conditionally incorporated into the Project prior to the Engineer's acceptance of a Certified Test Report and a Materials Certificate; however, payment for such incorporated material may not be made prior to acceptance by the Department of a Certified Test Report and Materials Certificate indicating that the material meets the Contract requirements.

1. A Certified Test Report (CTR) is a document containing a list of the dimensional, chemical, metallurgical, electrical and physical results obtained from a physical test of the materials involved, and shall demonstrate that the materials meet the requirements of the Contract. The CTR shall be signed by a duly-authorized and responsible agent of the original manufacturer of the material(s), and the signature must include the date the CTR was signed and notarized.

The CTR shall also include the following information:

- a. Description of material(s)
- b. Date of manufacture of the material(s)

- c. Date of test(s)
- d. Name of organization to which the material has been consigned
- e. Quantity of material represented
- f. Means of identifying the consignment, such as label, marking, lot number, etc.
- g. Date and method of shipment
- h. Name of organization performing the test(s)

2. A Materials Certificate (MC) is a document certifying that the materials, components and equipment furnished meet all requirements of the Contract. The MC shall be signed by a duly-authorized and responsible agent of the organization assembling or fabricating the material and the signature must include the date the MC was signed and notarized.

The MC shall also include the following information:

- a. Project for which the material has been consigned
- b. Name of Contractor to which material is supplied
- c. Item number and description of material
- d. Quantity of material represented by the MC
- e. Means of identifying the consignment, such as label, marking, lot numbers, etc.
- f. Identification of all sources of supply of material components
- g. Means of verifying Buy America requirements for steel and/or steel components
- h. Date and method of shipment

1.20-1.06.08—Facilities Construction - Warranties: Warranties shall be delivered to the Designer prior to acceptance of the Project.

Standard warranties are written warranties published by individual manufacturers for particular products, which are specifically endorsed by the manufacturer to the State. Special warranties are written warranties required by the Contract, either to extend time limits provided by standard warranties or to provide greater rights for the State. All required warranties shall be endorsed to, or have named as obligee, the State.

Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the Contractually-required warranty, that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required by the Contract to countersign special warranties with the Contractor.

Unless otherwise directed by the Engineer, the commencement date for warranties shall be the date of the issuance of the Certificate of Compliance. When a designated portion of the Project is completed and used by the Engineer or occupied by the Owner, by separate agreement with the Contractor during the construction period, the Contractor shall coordinate with the Engineer the submission date for properly-executed warranties and commencement date for those affected warranties. When a special warranty is required to be executed by the Contractor, or by the Contractor and a subcontractor, supplier or manufacturer, the Contractor shall prepare a written document that contains appropriate terms and identification, ready for execution by the required parties.

Written warranties made to the Engineer shall be deemed to supplement implied warranties, and shall not limit the duties, obligations, rights or remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations of the time in which the Engineer can enforce such other duties, obligations, rights, or remedies.

The Contractor shall submit draft warranties for approval prior to final execution. The Engineer reserves the right to reject warranties and to limit selections to products with warranties that do not conflict with Contract requirements.

Where the Contract requires a special warranty, or similar commitment regarding the Project or part of the Project, the Engineer reserves the right to refuse to accept the related work until evidence is presented that entities required to countersign such commitments are willing to do so.

Prior to the date for the Substantial Completion Inspection, the Contractor shall compile 3 copies of each required warranty, properly executed by the Contractor or any other required party. The Contractor shall place the warranty documents in an orderly sequence based on the organization of the Contract provisions (including specific CSI-formatted specifications contained within a particular Special Provision).

The Contractor shall:

- (a) Bind warranties in heavy-duty, commercial-quality, durable 3-ring vinyl-covered loose-leaf binders, thick enough to accommodate the contents, and sized to receive 8 1/2 inch × 11 inch paper.
- (b) Identify the binder's contents on the binder's front and spine with the typed or printed title "WARRANTIES," the Project title or name, and the name of the Contractor.
- (c) Provide a heavy paper divider with a tab for each separate warranty.

- (d) Mark the tab to identify the related product or installation.
- (e) Provide a typed description of the product or installation, including the name of the product, and the name, address and telephone number of the Contractor or pertinent subcontractor.
- (f) Furnish to the Department a written warranty for all Project work accompanied by a cover letter with the following contents:

[Addressed to:]

Commissioner of Transportation
 Department of Transportation
 P.O. Box 317546
 Newington, Connecticut 06131-7546

Project Title and Number

[We] hereby warrant all materials and workmanship for all work performed under this Contract for a period of one (1) year from [date of issuance of C.O.C.] against failures of workmanship and materials in accordance with the Contract. Furthermore, as a condition of this warranty, [we] agree to have in place all insurance coverage identified in the Contract for the performance of any warranty work.

[Signature:] [Name of authorized signatory]
 [Title]

- (g) Submit to the Engineer, upon completion of installation of materials or assemblies that are required to have either a flame-rating or a fire-endurance hourly rating, a detailed letter certifying that the required rating has been attained.

Upon determination by the Engineer that Project work covered by a warranty has failed, the Contractor shall replace or rebuild the work to an acceptable condition complying with Contract requirements. The Contractor is responsible for the cost of replacing or rebuilding defective construction or components and those which may have needed to be damaged or removed in order to cure the defective work including costs of material, equipment, labor, and material disposal, regardless of whether or not the State has benefited from use of the work through a portion of its anticipated useful service life. The Contractor shall respond to the Project Site when Project work covered by a warranty has failed within 3 calendar days, unless in the Engineer's opinion said failure is deemed to be an emergency, in which case the Contractor shall respond to the Project Site as directed by the Engineer.

When Project work covered by a warranty has failed and been corrected by replacement or rebuilding, the Contractor shall reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the time that remains on the original warranty period at the time of the failure.

1.20-1.06.25—Facilities Construction - Product Selection: The Contractor shall provide products that comply with the Contract, that are undamaged and, unless otherwise indicated, unused at the time of installation. The Contractor shall provide products complete with accessories, trim, finish, safety guards and other devices and details needed for a complete installation and the intended use and effect. The Contractor shall provide standard products of types that have been produced and used successfully in similar situations on other projects, when such products are available, unless the Contract requires otherwise. Descriptive, performance, and reference standard requirements in the Contract provisions establish salient characteristics of products.

Contractor's options for selecting products are limited by the Contract and governing regulations, and are NOT controlled by industry traditions or procedures used by the Contractor on previous construction projects. Procedures governing product selection include the following:

- (a) The Contractor shall not use product substitutes as defined in 1.20-1.01.01.
- (b) Semi-proprietary Specification Requirements: When the Contract lists 3 or more acceptable products or manufacturers unaccompanied by the term "Or Equal," the Contractor shall provide one of the products indicated. In such a case, no "Equal" will be permitted.
- (c) Non-Proprietary Specification Requirements: When the Contract lists products or manufacturers whose products are available and may be incorporated into the Project, or when the list is accompanied by the term "Or Equal," then the Contractor is not restricted to use those products, but may propose any available product that complies with Contract requirements.
- (d) Descriptive Specification Requirements: When the Contract describes a product or assembly, listing

exact characteristics required, with or without use of a brand or trade name, the Contractor shall provide a product or assembly that provides those characteristics and otherwise complies with the Contract.

- (e) Performance Specification Requirements: When the Contract contains performance requirements, the Contractor shall provide products that comply with those requirements, and that are recommended by the manufacturer for the application indicated. Such recommendations may be derived from the manufacturer's published product literature or by the manufacturer's certification of performance.
- (f) Visual Matching: When the Contract requires matching an established sample, the Engineer's decision will be final as to whether or not a proposed product matches satisfactorily. When no product available within the specified category matches satisfactorily and complies with other specified requirements, the Contractor shall comply with Contract provisions concerning "Or Equal" submissions for selection of a matching product in another product category.
- (g) Visual Selection: When a Contractual product requirement includes the phrase "...as selected by the Designer from manufacturer's full range ..." or a similar phrase, the Contractor shall select a product line that complies with Contract requirements. The Designer will select the color, gloss, pattern, density, or texture from the product line that includes both standard and premium items. Bids will be based on premium items.
- (h) Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers.

SECTION 1.20-1.07 LEGAL RELATIONS AND RESPONSIBILITIES FOR FACILITIES CONSTRUCTION

Replace Article 1.20-1.07.08 with the following:

1.20-1.07.08—Facilities Construction - Use of Explosives: To the extent possible, the Contractor shall avoid using explosives in proximity to existing structures. When the use of explosives is necessary for the prosecution of the Project, the Contractor shall take the utmost care not to endanger life or property.

The Contractor shall take adequate protective measures when engaging in blasting operations, and shall be responsible for any damage resulting from such operations.

The Contractor shall notify each utility with facilities in proximity to the site of such blasting operations, and any other individuals and entities that may be affected thereby, of the Contractor's intention to use explosives. Such notice shall be given sufficiently in advance of any blasting to enable such affected parties to take steps to prevent such blasting from injuring persons or property. Such notice shall not relieve the Contractor of responsibility for damage resulting from its blasting operations.

Replace Article 1.20-1.07.09 with the following:

1.20-1.07.09—Facilities Construction - Protection and Restoration of Property: The Contractor shall not enter upon public or private property for any purpose without having obtained written permission to do so from the owner of such property and having provided the Engineer with a copy of same. The Department is not, and may not be deemed, a party to any agreement between the Contractor and a property owner unless the Department executes said agreement.

The Contractor shall use every reasonable precaution to avoid disturbing or damaging public or private property, including, but not limited to, trees and monuments. The Contractor shall use suitable precautions to avoid disturbing or damaging underground or overhead structures or facilities, whether or not they are shown on the plans.

If the Project requires the moving or removal of a land monument or property marker, the Contractor shall not disturb it until a duly-authorized agent of the public or private property's owner has witnessed or recorded the monument or marker's location. The Contractor shall not move or remove such property until and unless directed to do so by the Engineer.

The Contractor shall not remove, cut, injure or destroy trees or shrubs without the Engineer's prior approval.

The Contractor shall be responsible for all damage to property resulting from any act, omission, neglect or misconduct in the Contractor's manner or method of executing its work, or due to its defective work or materials. When or where any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the Project work, the Contractor shall restore, at its own expense, such property to a condition as close as possible to that which existed before such damage was done, by repairing, rebuilding or otherwise restoring the property, as may be directed by the Engineer; or the Contractor shall make good such damage in another manner acceptable to the Engineer. If the Contractor fails to restore such property or make good such damage in a way acceptable to the Engineer, the Engineer may, upon 48 hours' notice, proceed to have such property repaired, rebuilt or restored as he may deem necessary; and the cost thereof will be deducted from any monies due or which may become due the Contractor under the Contract or under any other contract(s) that the Contractor may have with the State.

The Engineer shall mark the locations of underground facilities belonging to the State when given 3 calendar days (excluding Saturdays, Sundays, and State holidays) notice by the Contractor that it will be excavating or driving material into the ground near such facilities as a part of necessary Contract work. After the Engineer marks the location of such facilities, it will be the Contractor's responsibility to maintain the location markers until no longer needed. Repairs of State facilities located further than 1 ft from the line delineated by such markers shall be paid for by the State.

In Article 1.20-1.07.10, add the following paragraph:

“ It is further understood and agreed by the parties hereto, that the Contractor shall not use the defense of Sovereign Immunity in the adjustment of claims or in the defense of any suit, including any suit between the State and the Contractor, unless requested to do so by the State.”

Replace Article 1.20-1.07.18 with the following:

1.20-1.07.18—Facilities Construction - Use of State Property: The Contractor may not use State property for any purpose or activity other than carrying out the construction activities required by the Contract, except with the prior written consent of the Engineer.

Such other activities, which require the Engineer's advance consent, include, but are not limited to, the establishment of staging areas, storage areas, asphalt plants, concrete plants, or gravel/borrow pits; or the conduct of screening, crushing, manufacturing, or mining operations.

Any permitted use of the Project site or other State property for such other purposes or activities must be for the performance of the specific Contract only, and must be at no cost to the State. In addition, the Contractor may not assert or bring any claim or formal proceeding for damages or additional compensation based on either the approval or denial of a request to make such use of the Project site or other State property.

Under no circumstances shall the bulk storage of fuel or lubricants by the Contractor or its agents be permitted on State property. The Contractor shall not conduct work processes or store any construction materials or supplies of such types, quantities or configuration, either individually or in total, on, under or near a structure, that creates an unreasonable risk of substantial damage to State property. The Contractor shall not store any hazardous materials on State property other than those that are integral to the Contractor's performance of the Contract, as allowed by the Contract and in accordance with 1.20-1.10, or in writing from the Engineer. The Contractor shall have the responsibility and duty to ensure the proper storage, handling, management and disposal of any such hazardous materials. The Contractor shall be liable to the Department for all remedial or punitive costs, damages or penalties incurred by the Department as a result of the Contractor's failure to fulfill this duty.

The Engineer may require environmental testing of the affected site at the Contractor's expense both prior to and upon completion of the Contractor's permitted use of the site or of other related State property. The Contractor shall be responsible for ensuring that such a site is restored to the condition required by the Engineer and that all contaminants deposited on the site by the Contractor or its agents are removed and properly disposed of. All such restoration and removal activities must be carried out at the Contractor's expense, and must be carried out in accordance with the provisions of the Department's Required Best Management Practices, any applicable environmental permits, and all other applicable State or Federal laws or regulations.

The Contractor must submit any request to use State property for a staging or storage area to the District Engineer at the District Construction Office. The following information, at a minimum, must accompany

such written request:

- (a) A detailed description of the proposed operation or use of State property.
- (b) A site plan detailing the proposed location of any operations, materials, or facilities related to the requested use, including any appropriate sedimentation or erosion controls.
- (c) An area plan detailing anticipated ingress to and egress from the site of the proposed activity or the Project site, as appropriate, and indicating the location of and proximity to residential or occupied buildings in the vicinity.
- (d) Copies of any related, required or affected environmental permits.
- (e) A detailed listing or description of the anticipated dates and hours of the proposed operations or activities.
- (f) Photo documentation (a minimum of 12 - 8 inch × 10 inch color photographs) as follows:
 - (i) the preconstruction condition of each site of the proposed activities and
 - (ii) adjacent property at the boundaries of those areas.

If the site to be used or affected is State property that lies outside of any Department right-of-way, the Contractor must also obtain from other State agencies all necessary or appropriate authorizations for the proposed use(s) of State property.

Any request by the Contractor relating to a proposed use of State property for activities other than the establishment of a construction staging or storage area must also be submitted to the District Engineer at the District Construction Office, and must include the same information required by (a) through (f) of the preceding paragraph. In addition, in connection with such other requests, the Contractor must submit to the District Engineer:

- (g) written confirmation from the municipality or municipalities in which each affected site is located that each such municipality has no objection to the proposed use or activity; and
- (h) a license agreement with the Department, executed by the Contractor, on terms acceptable to the Department, defining the nature and scope of the proposed use or activity.

Gore areas are not available for disposal of surplus material.

For any request to establish or operate an asphalt batching or continuous mix facility, the Contractor must also provide to the District Engineer at the District Construction Office a map detailing the outermost perimeter of the proposed facilities and operations, showing all related and potentially-affected structures, land uses, watercourses, wetlands, and other areas of environmental concern within 1/3 of a mile of the facility or operation perimeter. No such facility will be permitted on State property where any hospital, nursing home, school, area of environmental concern, watercourse, or residential housing exists within 1/3 of a mile of the perimeter of the facility or operation (as per Public Act 98-216).

SECTION 1.20-1.08 PROSECUTION AND PROGRESS FOR FACILITIES CONSTRUCTION

In the list of Articles, change the title of Article 1.20-1.08.10 "Annulment of Contract" as follows:

1.20-1.08.10—Facilities Construction - Termination of Contract for Cause

Replace Article 1.20-1.08.08 with the following:

1.20-1.08.08—Facilities Construction - Extension of Time: The Contractor may present to the Engineer a request in writing for an extension of Contract time if the time necessary for completion of the Project has been increased due to extra or added work or delays resulting from unforeseeable causes beyond the control and without the fault or negligence of the Contractor, except for weather or seasonal conditions (unless extraordinary and catastrophic). Such causes include, but are not limited to, natural catastrophes, acts of the State in either its sovereign or contractual capacity, acts of another contractor in the performance of a contract with the State, the presence of utility facilities (including railroads), fires, strikes, floods, or delays by suppliers arising from unforeseeable causes beyond the control and without the fault or negligence of either the Contractor or such suppliers.

The Contractor's plea that insufficient Contract time was allowed under the Contract before commencement of the Project is not a valid reason for extending the Contract time. Requests for an extension of time with adequate substantiation must be presented within 60 calendar days from the event that is the basis of the request or from the first effect of such an event on the Project. The Contractor will be responsible for providing all the documentation necessary to support the reasonableness of the additional

time requested. This shall include a Critical Path Method Schedule Analysis and accompanying narrative that includes the specific dates and number of days for which the extension is sought, the basis or bases for the extension, and the schedule analysis illustrated in a graphic representation of the schedule impacts such as a bar chart or other type of graphical schedule. The critical path is a sequence of activities in a project wherein none of the activities can be delayed without affecting the final project end date.

Such requests will be considered by the Engineer and granted to the extent that he deems to be fair and reasonable. Requests will not be considered if based on delays caused solely by conditions existing at the time the bids were received and of which the Contractor might reasonably be expected to have had full knowledge at the time, or upon delays caused by failure on the part of the Contractor to anticipate properly the requirements of the Project as to materials, labor, or equipment. For all Project delays or time increases, except as provided below, additional Contract time is the sole remedy that the Contractor may have, and such periods of additional Contract time shall be deemed "Non-Compensable Delays." For delays caused by the State in its Contractual capacity, the Contractor may, in addition to a time extension, request additional compensation to reimburse it for damages sustained as a direct result of such delay, and such periods of extended Contract time may be deemed "Compensable Delays."

The period of compensable delay is limited as follows:

- (1) it may not include time more than 60 days prior to the Engineer's receiving written notice from the Contractor, with adequate substantiation, of its intent to claim damages for the delay, and
- (2) and it may not include periods of delay for which the State was responsible, but during which the Contractor experienced concurrent delays for which the State was not responsible.

Damages for periods of Project delay for which the State had sole responsibility shall be limited to the increased costs incurred by the Contractor (which shall not include lost profits), which the Contractor substantiates and which the Contractor shows were caused by such delays.

The Critical Path Method Schedule Analysis shall include at a minimum:

1. The manner in which the Contractor planned to construct the Project, in terms of activities, logical interrelationships of activities, work sequences, activity durations, and calendars.
2. The actual duration and sequences of the activities, based on what actually occurred on the Project.
3. The variances between the planned and actual performance of the work, listed in a chronological and cumulative manner, summing to the net total delay on the Project at the time of the request.
 - a. The causes of the variances between the planned and actual performance of the work, specifically allocating legal responsibility for each to either the Department or the Contractor.
 - b. The effects of the variances in work sequences, activity durations, manpower, and resources on the incurred costs of the affected party or parties.
4. An identification analysis of the causes of any concurrent delays on the Project.
5. Statements as to whether the time extension days sought are compensable or non-compensable, along with a specific statement of any compensation requested in connection with the time extension. Any request for a time extension that does not include a corresponding request for compensation will be assumed to be a request for a non-compensable time extension.
6. All associated analysis documents, worksheets, schedules and contemporaneous documents supporting the Critical Path Method Schedule Delay Analysis.

Replace Article 1.20-1.08.10 with the following:

1.20-1.08.10—Facilities Construction - Termination of Contract for Cause: The Commissioner may give notice in writing to the Contractor and its surety of any delay, neglect, or default of the Contractor which the Commissioner believes has occurred, including one or more of the following:

1. Failure to begin the Project on the date specified in the Notice to Proceed.
2. Failure to perform the Project with sufficient personnel, equipment or materials to ensure timely Project completion.
3. Unsuitable performance of the Project or failure to perform Project work in accordance with the Contract.
4. Failure or refusal to remove or correct work rejected by the Engineer.
5. Discontinuance of suitable prosecution of the Project for a period of 72 hours, excluding Sundays and holidays, without written authorization to do so from the Engineer.
6. Failure to recommence discontinued work within 48 hours (excluding Sundays and holidays) after

being ordered to do so by the Engineer.

7. Insolvency, filing for bankruptcy, or any act or occurrence which may render the Contractor financially incapable of completing the Project.
8. Failure to satisfy any final judgment for a period of 30 calendar days.
9. Making of any assignment for the benefit of creditors.
10. Violation of any provisions of the Contract.
11. Any other cause which, in the judgment of the Commissioner, warrants termination, including, but not limited to, violations of the antitrust or criminal laws, and attempts to deceive or defraud the Department in material matters.

If the Contractor or surety within a period of 10 calendar days after such notice does not proceed in conformance with the directions set forth in the notification, or fails to present a remedial plan of operation satisfactory to the Commissioner, then the Commissioner may, at his discretion, order the surety to complete the Project or, without violating the Contract, take the right to control and prosecute the Project out of the hands of said Contractor and surety. No termination of the Contract for such cause will be deemed to have occurred, however, unless the Commissioner himself or herself (and not merely a designated representative of his or hers) expressly declares it in a writing to the Contractor.

The Department may acquire or rent whatever materials or equipment are necessary in order to complete the Project and may seize and use for purposes of the Project (with any appropriate compensation to the Contractor) any material or equipment that the Contractor acquired or purchased expressly for the Project in accordance with a specific Contract requirement.

The Department may also enter into an agreement, either by negotiation or public letting, for the completion of the Contract according to the terms and provisions thereof, or use such other methods or combinations thereof as in the Commissioner's opinion shall be required or desirable for the completion of the Contract in an acceptable manner. All costs and charges incurred by the Department, in connection with completing the Project under the Contract, or as a result of the Contractor's default, shall be deducted from any monies due to or which may become due to the Contractor. In case such expense exceeds the sum which would have been payable under the Contract, then the Contractor and the surety shall be liable for, and shall pay to the State, the amount of the excess.

SECTION 1.20-1.09 MEASUREMENT AND PAYMENT FOR FACILITIES CONSTRUCTION

In the list of Articles, add the following:

1.20-1.09.00—Facilities Construction - Unit Price Items, Lump Sum Items, Major Lump Sum Items

Add Article 1.20-1.09.00 as follows:

1.20-1.09.00—Facilities Construction - Unit Price Items, Lump Sum Items, Major Lump Sum Items: Facilities Construction projects are bid with both lump sum and unit price items which are in addition to the Major Lump Sum Item (MLSI) of the Project. These separate items will be measured for payment on a unit price or lump sum basis (whichever is applicable) for which a separate bid price is required, at the quantities indicated in the Bid Proposal Form. Each item to be measured is more specifically described in a corresponding Standard Specification or a special provision.

Standard Items are referenced by their item numbers; refer to the applicable article for the requirements for this item. Special provisions are referenced by their item number followed by an "A" suffix; refer to the special provisions for requirements for this item.

All work depicted on the Contract Plans and described in the Contract Specifications, including mobilization and project closeout, is included in the MLSI of the Project, with the exception of the unit price or other lump sum items listed in the Bid Proposal Form. Any work incidental to an item which is not specifically described or included in the item, but which is required for performance and completion of the work required under the Contract, is included in the MLSI.

Replace Article 1.20-1.09.04 with the following:

1.20-1.09.04—Facilities Construction - Extra and Cost-Plus Work: Extra work shall be performed only under the conditions and subject to the requirements outlined in 1.20-1.04.05. Payment for extra work

may be made on any unit price or lump sum price or other basis to which the Engineer and the Contractor agreed in writing, or the Engineer may order that the Contractor will be paid for the work on the cost-plus basis described in this Article.

The following sets forth the components of the cost-plus basis for making payments:

(a) Labor:

- (1) For all labor used by the Contractor for the subject work, the Department will pay the Contractor the wage rate that it actually paid for same, as shown by its certified payroll, which shall be at least the minimum rate established for the Project by the CT Department or the U.S. Department of Labor. For all foremen in direct charge of Project work, the Department will pay the Contractor the actual wage paid to the foremen as shown on the Contractor's certified payroll.
- (2) The Department will reimburse the Contractor for the actual costs paid to, or on behalf of, workers by reason of allowances, health and welfare benefits, pension fund benefits and other such benefits in connection with the subject work, when such amounts are required by a collective bargaining agreement or another employment contract generally applicable to the classes of labor employed on the Project. The Contractor shall certify all such costs in writing to the Engineer.
- (3) For property damage, liability and workmen's compensation insurance premiums, unemployment insurance contributions and social security taxes on Project cost-plus work, the Department will reimburse the Contractor for its actual Project costs. The Contractor shall provide to the Engineer documentation, satisfactory to the Engineer in form and substance, of all such costs.
- (4) The Department will also pay to the Contractor an amount equal to 20% (15% for overhead, 5% for profit) of the total sums described in **(a)** (1) through (3) above.

No part of the salary or expenses of anyone connected with the Contractor's forces above the grade of project superintendent, who provides general supervision of Project work, will be included in the above payment calculations, except when the Contractor's organization is entirely occupied with cost-plus work, in which case the salary of a superintendent may be included in said labor item when the nature of the pertinent Project work is such that, in the opinion of the Engineer, a superintendent was required for that work. The Engineer and the Contractor may agree in writing to the allowable rate of pay for such superintendent, or the Engineer may make payment based on such rate as he deems reasonable.

The Engineer reserves the right to determine the number and type of personnel to be employed for the cost-plus Project work.

(b) Specialized Work: When the Engineer directs the Contractor to perform specialized work requiring skills, tools and equipment substantially unlike those ordinarily used by the Contractor or its authorized Project subcontractors, the Department will pay the Contractor for the use of a specialist to perform the specialized work. For such specialized services, including materials incorporated into the Project, the Department will pay the Contractor its actual costs, plus additional compensation in accordance with subparagraph (e) below. If so requested by the Engineer, the Contractor shall obtain and submit to the Engineer, prior to performing such specialized work, a minimum of three price quotes for the work.

(c) Materials: For all materials necessary for cost-plus Project work, the Department will pay the Contractor its actual cost for such materials, including delivery charges as shown by original receipted bills, plus 15 % of the sum of said cost and charges.

In lieu of receipted bills for materials used for the Project, but which were not specifically purchased for the Project, but rather were taken from the Contractor's stock, the Contractor shall provide to the Engineer an affidavit certifying that such materials were not purchased for the Project, that the materials were taken from the Contractor's stock, that the quantity claimed to have been used on the Project was actually so used, and that the price claimed for the materials reflects their fair market value at the time of their use on the Project. The Department will pay for costs of transporting the materials to the Project site, in accordance with subparagraphs (a) and (d) hereof.

The Department will not reimburse the Contractor for any penalty or charge incurred by the Contractor due to the Contractor's late or delayed payment for the pertinent materials.

(d) Equipment: All equipment used for cost-plus Project work must, in the judgment of the Engineer, be in good working condition and suitable for its Project purpose; and the Engineer reserves the right to determine the size and number of units of equipment to be used for such work. The manufacturer's ratings shall be the basis for all Rental Rate Blue Book classifications used for payment purposes. ("Rental Rate Blue Book" as used in these specifications refers to the current edition of the Rental Rate Equipment Watch Blue Book Services, taking into account all current Rate Adjustment Tables, and amendments thereof.) Trucks will be classified by cubic-yard capacity.

No percentage mark-up will be added for payment purposes to amounts charged by the Contractor based

on equipment rental rates.

The Department will not pay rental rates for small tools needed to complete the cost-plus Project work.

For payment purposes, estimated operating costs per hour from the Rental Rate Blue Book will apply only to the actual time during which the equipment is actively being used to perform cost-plus Project work.

For equipment that is also being used for non-cost-plus Project work, the Department will pay the applicable hourly rate only for the actual time that the equipment was assigned to cost-plus Project work. The applicable period of assignment for each piece of equipment shall start when the equipment commences to be used for cost-plus Project work ordered by the Engineer, and shall end at the time designated by the Engineer.

For equipment brought to the Site exclusively for cost-plus work, the Department will reimburse the Contractor for loading and unloading costs and costs of transporting such equipment to and from the Project site; provided, however, that payment for return transportation from the Site shall not exceed the cost of moving the equipment to the Site. If such a piece of equipment is self-propelled, and is driven to the Site under its own power, then the Department will pay only operating costs and labor costs for its transport to and from the Project site. The Department will not, however, pay for any loading, unloading and transportation costs if the equipment is used for any Project work on the Site other than cost-plus work.

- (1) Owned Equipment: The Department will pay the Contractor the applicable rental rate set forth in the Rental Rate Blue Book for any equipment (1) which the Contractor uses, with the Engineer's authorization, to perform cost-plus Project work, and (2) which is owned by the Contractor or a subsidiary, affiliate, or parent company of the Contractor (no matter how far up or down the chain of ownership from the Contractor).

The maximum hourly rate to be used in paying for Contractor-owned equipment assigned to cost-plus work shall be the applicable monthly rate in the Rental Rate Blue Book, divided by 176 (176 working hours per month).

Should the proper completion of the cost-plus Project work require equipment of a type not covered by the Rental Rate Blue Book, the Engineer will determine, and the Department will make payment to the Contractor at, a reasonable rental rate based on relevant rates prevailing in the area of the Project. If practicable, such rates shall be determined by the Engineer before the affected work is begun. If the Contractor proposes that the Engineer use a particular rate in such an instance, the Contractor must disclose to the Engineer the specific sources of, or support for, said rate.

If a piece of equipment owned by the Contractor is assigned to cost-plus Project work, but remains idle for some portion of the period of the cost-plus work, the Department will pay for that idle time at 50% of the applicable rental rate (exclusive of operating costs) in the Rental Rate Blue Book.

For payment purposes, the period of equipment usage shall be deemed to start when the Contractor begins to use the equipment for cost-plus Project work and shall be deemed to end when the equipment is released by the Engineer from use for such work. Any hours during which the equipment is used for work other than cost-plus Project work will be deducted from the pertinent payment period.

For any piece of Contractor-owned equipment assigned to cost-plus Project work, the Department will reimburse the Contractor for an aggregate minimum of 8 hours (of use time, idle time, or a combination thereof) in each 24-hour day (measured from one midnight to the following midnight) during the assignment period. No such reimbursement will be made, however, for Saturdays, Sundays and legal holidays during which the Contractor does no Project work, or for any other day on which the Engineer orders the Contractor to do no Project work. If the equipment is used to perform cost-plus Project work for more than 8 hours in a day, the Department will pay the Contractor at the applicable hourly rate computed on a monthly basis for the actual time of use; however the Department will not pay the Contractor for more than 8 hours of idle time for a piece of equipment during a given day.

The Department shall have the right to limit its aggregate Project payments for idle time for a given piece of equipment to the replacement value of that equipment.

- (2) Rented Equipment: If the Engineer determines that in order to perform the cost-plus Project work the Contractor must rent certain machinery, trucks or other equipment not owned by the Contractor or a subsidiary, affiliate, or parent company of the Contractor (no matter how far up or down the chain of ownership from the Contractor), the Contractor shall provide to the Engineer in writing, in advance of such rental,
 1. the specific nature of the rental(s),
 2. the reasons for its need for such rental(s),

3. the anticipated or proposed rental rate(s), and
4. the estimated duration for the use of each piece of such rented equipment.

Proposed rates for such rented equipment must be based on the following:

- A daily rate per hour when the equipment is to be specifically assigned to Project work by the Engineer for a period of 7 consecutive calendar days or less.
- A weekly rate per hour when such assigned time exceeds 7 consecutive calendar days, but does not exceed 21 consecutive calendar days.
- A monthly rate per hour when such assigned time exceeds 21 consecutive calendar days.

The applicable daily, weekly, or monthly rate will be determined at the expiration of 21 calendar days or upon release of the equipment by the Engineer, whichever occurs first. Interruptions of the rental period, when equipment is used for work other than assigned cost-plus work, will not entitle the Contractor to payment at a rental rate that would be applicable to a shorter period that might arguably have been occasioned by such interruptions.

If so requested by the Engineer, the Contractor shall, prior to renting such equipment, obtain and submit to the Engineer in writing a minimum of three rate quotes for rental of the equipment.

The Department will pay the Contractor for such rental at the rate actually paid by the Contractor, provided that the given use and rental rate are acceptable to the Engineer. In order to obtain such payment, the Contractor must provide the Engineer with a copy of the original receipted bill for the rental expenses incurred.

(e) Administrative Expense: When extra work is performed on a cost-plus basis by a subcontractor acceptable to the Engineer, the Department will pay the Contractor an additional 7.5% for that work; such payment will be in addition to the percentage payments described in (a), (b), (c) and (d) above, as a reimbursement for the Contractor's administrative expense in connection with such work. The Engineer will approve such additional payments only if and when the Contractor provides to the Engineer receipted invoices for all relevant costs.

(f) Miscellaneous: The compensation provided for in (a), (b), (c), (d) and (e) above shall be deemed to be payment in full for the extra work, and shall be deemed as full compensation for same, including costs of superintendence, use of small tools, equipment for which no rental is allowed, safety equipment, consumables, field office overhead, home office overhead, bonding, other insurance, and profit. The Contractor's representative and the Engineer shall compare their respective records related to the extra work done on a cost-plus basis at the end of each day. Copies of these records shall be signed by both the Engineer and the Contractor's representative. The Engineer will then forward a copy of same to the Contractor and to any affected subcontractor in accordance with Department procedures. Upon payment of such costs by the Contractor, the Contractor shall immediately furnish the Engineer with original receipted bills covering the costs, including transportation charges, for all materials used for such work.

Replace Article 1.20-1.09.05 with the following:

1.20-1.09.05—Facilities Construction - Eliminated Items: The Engineer may eliminate from the Contract any pay unit item, or any portion of Project work contained in a lump sum item by giving written notice of said elimination to the Contractor. Such elimination shall in no way invalidate the Contract.

The Engineer will make final payment to the Contractor for materials at the actual cost of the materials for eliminated pay unit items or portions of work contained in a lump sum item only under the following terms and conditions:

1. the materials were ordered by the Contractor prior to the Engineer's issuance to the Contractor of a written notice of the unit or work's elimination (as evidenced by a dated invoice from the vendor);
2. the materials conformed to all Contract requirements; and
3. the Contractor could not have cancelled its order within 2 days after the issuance of the elimination notice.

Any materials paid for by the Department on these conditions shall then be property of the State, and the State shall assume, or shall reimburse the Contractor for, the actual cost of any further handling necessary to deliver said materials to a location designated by the Engineer.

If the relevant materials purchased by the Contractor are returnable to their vendor and if the Engineer so directs, the Contractor shall return the materials to the vendor, in which case the Department will reimburse the Contractor for any reasonable changes made to the Contractor by the vendor for the return of the materials, and for the actual costs to the Contractor of its handling the materials in returning them to the vendor. Such reimbursements by the Department shall be computed as though the work were being paid for on a cost-plus basis under 1.20-1.09.04.

If the Engineer determines that an elimination of a pay unit item or portion of work contained in a lump sum item constitutes a "significant change" in the character of the Contract work, as defined under 1.20-1.04.03, necessitated by a written order of the Engineer, the terms of 1.20-1.04.03 shall govern the payment to be made in relation to the eliminated item or work.

**SECTION 1.20-1.10
ENVIRONMENTAL COMPLIANCE FOR
FACILITIES CONSTRUCTION**

In the list of articles, add the following:

1.20-1.10.09—Facilities Construction – Compliance with Existing Site Permits

Add Article 1.20-1.10.09 as follows:

1.20-1.10.09—Facilities Construction – Compliance with Existing Site Permits: The Contractor shall conduct its operations in conformance with the permit requirements established by Federal, State and municipal laws and regulations.

In addition to permits obtained by the Department specifically for the Project, facilities have existing site specific permits and regulatory requirements related to site operational activities. The specific permits and regulatory requirements will be identified in the Contract. The Contractor shall become familiar with these requirements and shall conduct their operations in conformance with these requirements.

The Contractor shall be responsible for, and hold the State harmless from, any penalties or fines assessed by any authority due to the Contractor's failure to comply with any term of an applicable environmental permit.

**SECTION 1.20-1.11
CLAIMS FOR
FACILITIES CONSTRUCTION**

Replace Section 1.20-1.11 in its entirety with the following:

**SECTION 1.20-1.11
CLAIMS FOR
FACILITIES CONSTRUCTION**

1.20-1.11.01—Facilities Construction - General

1.20-1.11.02—Facilities Construction - Notice of Claim

1.20-1.11.03—Facilities Construction - Record Keeping

1.20-1.11.04—Facilities Construction - Claim Compensation

1.20-1.11.05—Facilities Construction - Required Claim Documentation

1.20-1.11.06—Facilities Construction - Auditing of Claims

1.20-1.11.01—Facilities Construction - General: When the Contractor files against the Department or the State a formal claim (a “formal” claim being one that seeks resolution through binding arbitration or court litigation, rather than through negotiation or mediation) under CGS Section 4-61 as revised (“Section 4-61”), whether as a Section 4-61 notice of claim, demand for arbitration or as a complaint in the Superior Court, the Contractor must follow the procedures and comply with the requirements set forth in this Section of the Specifications, as well as those set forth in Section 4-61. If this Section sets forth additional, more specific, or demanding requirements than does Section 4-61 in any respect, this Section shall govern the matter. While the requirements of this Section may not strictly apply to informal claims (“informal” claims being those which the Contractor seeks to resolve through negotiations with the Department, in or outside of a mediation) for additional compensation or other relief from the Department, the Contractor should understand that the Department may need and may demand (in which case the Contractor must provide), the same kinds of documentation and other substantiation that are required under this Section for formal claims. In addition, any time extension request submitted as part of a claim, must satisfy the requirements of this specification and those of 1.20-1.08.08. It is the intent of the Department to compensate the Contractor for actual increased costs caused by or arising from acts or omissions on the part of the Department that violate legal or contractual duties owed to the Contractor by the Department.

1.20-1.11.02—Facilities Construction - Notice of Claim: Whenever the Contractor intends to file a demand for arbitration or a court complaint against the Department under Section 4-61, the Contractor must first notify the Commissioner of the details of said claim, in writing via certified mail (in strict compliance with Section 4-61), and such written notice must contain all pertinent information described in 1.20-1.11.05 below.

Once a formal notice of a claim under Section 4-61 has been given to the Commissioner, the claimant may not change the claim in any way, in either concept or monetary amount, except insofar as the claim seeks damages that will continue to accrue after submission of the notice, in ways described and anticipated in that notice.

1.20-1.11.03—Facilities Construction - Record Keeping: The Contractor shall keep daily records identifying:

- (1) Each aspect of the Project affected by matters related to any claim for additional compensation or relief that the Contractor has filed, intends to file, or has reason to believe that it may file against the Department
- (2) The specific Project locations where Project work has been so affected
- (3) The number of people working on the affected aspects of the Project at the pertinent time(s)
- (4) The types and number of pieces of equipment on the Project site at the pertinent time(s)

All events or conditions that have a potential or anticipated effect on the Project’s progress or schedule and that may result in a claim by the Contractor shall be documented contemporaneously with the event or discovery of the pertinent condition(s), or immediately thereafter. If this is not done, the Contractor may not file the related claim and may not be awarded relief upon it. Without such information, the Department and the Office of the Attorney General may not be able to adequately determine what claims have merit or to what extent they have merit, or what amounts of compensation may be warranted and supportable. Moreover, State officials involved in the analytic or negotiation process may not be able to properly substantiate and support the recommendations that they must make to their superiors, including the Attorney General, and sometimes the Governor, in the course of a settlement process.

1.20-1.11.04—Facilities Construction - Claim Compensation: If the Contractor proves entitlement for damages, payment shall be made in accordance with the following provisions:

(a) **Compensable Items:** The liability of the Department for claims will be limited to the following specifically-identified items of cost, insofar as they have not otherwise been paid for by the Department (for instance, through payment for extra work, which under 1.20-1.04.05 includes overhead and profit), and insofar as they were caused solely by the actions or omissions of the Department or its agents. The Department will pay for direct labor expenses, direct costs for materials, and direct costs for active equipment use, plus an additional ten percent (10%) of the total amount of such direct costs as payment for home office overhead and profit.

Compensable delay-related costs: The Department will pay for any additional field office overhead and idle equipment costs for each day of Project Critical Path delay or suspension caused solely by action or inaction of the Department.

If the Critical Path delay or suspension period is less than 30 calendar days, the Department will pay an additional ten percent (10%) of the additional field office overhead costs as payment for home office overhead and profit. For delays less than 30 calendar days, idle equipment will be paid at 50% of the Rental Rate Blue Book rate.

For delays equal to or longer than 30 calendar days, the Department will pay a per diem rate, calculated as six percent (6%) of the original total Contract amount divided by the original number of days of Contract time, as payment for home office overhead and profit.

In paying for idle equipment equal to or longer than 30 calendar days, the Department will pay for actual equipment costs. Actual equipment costs shall be based upon records kept in the normal course of business and in accordance with generally-accepted accounting principles. Under no circumstances shall Rental Rate Blue Book or other guide or rental rates be used for this purpose (unless the Contractor had to rent the equipment from an unrelated party, in which case the actual rental charges paid by the Contractor, so long as they are reasonable, shall be reimbursed by the Department).

If the final Contract Value is greater than the original Contract Value, any delay-related costs that are compensable under this Article shall be reduced by eight percent (8%) of the difference between the final Contract Value and the original Contract Value.

Such payments for compensable delay-related costs shall be deemed to be complete and mutually-satisfactory compensation for field and home office overhead related to the period of delay or suspension.

Subcontractor costs of any kind, however, may be paid for by the Department only (a) in the context of a negotiated claims settlement or (b) if the Contractor has itself paid or legally-assumed, present unconditional liability for those subcontractor costs.

(b) **Non-Compensable Items:** The Department will have no liability for the following specifically-identified non-compensable items:

- (1) Profit, in excess of that provided for herein.
- (2) Loss of anticipated profit.
- (3) Loss of bidding opportunities.
- (4) Reduction of bidding capacity.
- (5) Home office overhead in excess of that provided for herein.
- (6) Attorney's fees, claims preparation expenses, or other costs of claims proceedings or resolution.
- (7) Any other consequential or indirect expenses or costs, such as tort damages, or any other form of expense or damages not provided for in these Specifications or elsewhere in the Contract.

1.20-1.11.05—Facilities Construction - Required Claim Documentation: All claims shall be submitted in writing to the Commissioner, and shall be sufficient in detail to enable the Engineer to ascertain the basis and the amount of each claim, and to investigate and evaluate each claim in detail. When submitting any claim over \$50,000, the Contractor shall certify in writing, under oath and in accordance with the formalities required by the Contract, that the following are true:

1. That supporting data is accurate and complete to the Contractor's best knowledge and belief;
2. That the amount of the dispute and the dispute itself accurately reflects what the Contractor in good faith believes to be the Department's liability.

The certification shall be executed by an officer or general partner of the Contractor having overall responsibility for the conduct of the Contractor's affairs.

When submitting a claim to the Commissioner, as a minimum, the Contractor must provide the following information for each and every claim and sub-claim asserted:

- (a) A detailed factual statement of the claim, with all dates, locations and items of work pertinent to the claim.

- (b) A statement of whether each requested additional amount of compensation or extension of time is based on provisions of the Contract or on an alleged breach of the Contract. Each supporting or breached Contract provision and a statement of the reasons why each such provision supports the claim, must be specifically identified or explained.
- (c) Excerpts from manuals or other texts which are standard in the industry, if available, that support the Contractor's claim.
- (d) The details of the circumstances that gave rise to the claim.
- (e) The date(s) on which any and all events resulting in the claim occurred, and the date(s) on which conditions resulting in the claim first became evident to the Contractor.
- (f) Specific identification of any pertinent document, and detailed description of the substance of any material oral communication, relating to the substance of such claim.
- (g) The name, function, and pertinent activity of each Contractor's or subcontractor's official, or employee involved in or knowledgeable about events that give rise to, or facts that relate to, the claim.
- (h) The amount(s) of additional compensation sought and a breakdown of the amount(s) into the categories specified as payable under 1.20-1.11.04 above.
- (i) The name, function, and pertinent activity of each Department official, employee or agent involved in or knowledgeable about events that give rise to, or facts that relate to, the claim.

1.20-1.11.06—Facilities Construction - Auditing of Claims: All claims filed against the Department shall be subject to audit by the Department or its agents at any time following the filing of notice of such claim. The Contractor and its subcontractors and suppliers shall cooperate fully with the inquiries and document requests of the Department's auditors. Failure of the Contractor, its subcontractors, or its suppliers to maintain and retain records that are sufficient to enable the Department or its agents to fully evaluate the claim shall constitute a waiver of any portion of such claim that cannot be verified by specific, adequate, contemporaneous records, and shall bar recovery on any formal claim or any portion of such a claim for which such verification is not produced. Without limiting the foregoing requirements, and as a minimum, the Contractor shall make available to the Department and its agents the following documents in connection with any claim that the Contractor submits:

- (1) Daily time sheets and project superintendent's daily reports.
- (2) Union agreements, if any.
- (3) Insurance, welfare, and benefits records.
- (4) Payroll register.
- (5) Earnings records.
- (6) Payroll tax returns.
- (7) Records of property tax payments.
- (8) Material invoices, purchase orders, and all material and supply acquisition contracts.
- (9) Materials cost distribution worksheets.
- (10) Equipment records (list of company equipment, rates, cost pools, etc.).
- (11) Vendor rental agreements
- (12) Subcontractor and vendor subcontracts, purchase orders, and/or agreements including all change orders and modifications.
- (13) Subcontractor and vendor invoices to the Contractor, and the Contractor's certificates of payments to subcontractors and vendors.
- (14) Subcontractor payment certificates.
- (15) Canceled checks (payroll, subcontractors, and vendors).
- (16) Job cost reports.
- (17) Job payroll ledger.
- (18) General ledger, general journal (if used), and all subsidiary ledgers and journals, together with all supporting documentation pertinent to entries made in these ledgers and journals.
- (19) Cash disbursements journals.
- (20) Financial statements for all years reflecting the operations on the Project.
- (21) Income tax returns for all years reflecting the operations on the Project.
- (22) Depreciation records on all company equipment, whether such records are maintained by the company involved, its accountant, or others.
- (23) If a source other than depreciation records is used to develop costs for the Contractor's internal purposes in establishing the actual cost of owning and operating equipment, all such other source documents.

- (24) All documents which reflect the Contractor's actual profit and overhead during the years that the Project was being performed, and for each of the five (5) years prior to the commencement of the Project.
- (25) All documents related to the preparation of the Contractor's bid, including the final calculations on which the bid was based.
- (26) All documents which relate to the claim or to any sub-claim, together with all documents that support the amount of damages as to each claim or sub-claim.
- (27) Worksheets used to prepare the claim, which indicate the cost components of each item of the claim, including but not limited to the pertinent costs of labor, benefits and insurance, materials, equipment, and subcontractors' damages, as well as all documents which establish the relevant time periods, individuals involved, and the Project hours and the rates for the individuals.

SECTION 2.02
ROADWAY EXCAVATION, FORMATION OF
EMBANKMENT AND DISPOSAL OF
SURPLUS MATERIAL

In Article 2.02.03, change the last sentence of the first paragraph as follows:

Where buildings have been removed to clear the way for construction or where old foundations, concrete or masonry walls exist, they shall be removed to 2 feet below the directed or finished grade; and all cellar and other holes shall be filled with suitable material.

In Article 2.03.03, revise Subarticle 6. Compaction as follows:

6. Compaction: The entire area of each layer of the embankment and the subgrade in the excavated areas shall be uniformly compacted to at least the required minimum density by use of compaction equipment consisting of rollers, compactors or a combination thereof. Earth-moving and other equipment not specifically manufactured for compaction purposes will not be considered as compaction equipment.

The dry density after compaction shall not be less than 95% of the maximum dry density for that soil when determined by the Contractor in accordance with AASHTO T 180 and measured in-place with ASTM D6938 or other methods approved by the Engineer.

The Contractor shall perform in-place density testing at a sufficient frequency to ensure that the specified test results are continuously met. The Contractor shall submit complete field density testing and inspection records to the Engineer within 48 hours (excluding weekends and holidays) of the test in a manner acceptable to the Engineer.

Replace Article 2.02.04 with the following:

2.02.04—Method of Measurement: Payment lines for earth excavation shall coincide with the slope and subgrade lines or the top of the payment lines for ditch excavation, whichever applies, as shown on the plans or as ordered. The amount of excavation will be determined as described below by the average end area method, or by a method approved by the Engineer.

Payment lines for unsuitable material excavation shall be the area designated by the plans, special provisions or the Engineer as unsuitable material below the subgrade in cut sections, below the original ground line in fill sections and beyond the normal payment lines for ditch and channel excavation.

Unsuitable material within the slope and subgrade lines or the top of the normal payment lines for ditch and channel excavation shall be measured as earth excavation, ditch excavation or channel excavation.

Any stockpiling, drying or re-excavation necessary to utilize such material on the Project shall not be measured for payment, but shall be included in the payment for unsuitable material.

Also measured for payment shall be the volume of earth moved in cutting or plowing of steps on steep slopes, as described in 2.02.03, and the removal of existing flexible pavement where shown on the plans or ordered by the Engineer.

The stockpiling, re-excavation and final placement of material will not be measured for payment, unless such has been made a part of the Contract or unless the State has created conditions different from those that existed or could have been foreseen or anticipated when the Contract was bid.

Payment lines for Channel Excavation—Earth shall coincide with the side slopes and bottom of channel as shown on the plans or as directed.

Payment lines for Channel Excavation-Rock shall coincide with the depth shown on the plans or to the depth ordered. Payment lines for slopes will be extended to a limit of 12 inches outside of and parallel to the slope lines shown on the plans, or as ordered, to include rock actually removed within this limit. In case of natural faults or fissures which make the removal of additional rock necessary for reasons of safety, or which produce slides clearly not attributable to the Contractor's method of operation, the slope payment lines will be fixed to coincide with the natural faults or fissures of the rock.

Payment lines for rock excavation, where presplitting bedrock is required by these specifications, will extend to the slope and depth line shown on the plans or as directed, to include only the rock actually removed within this limit.

Payment lines for rock excavation, where presplitting bedrock is not required by these specifications, shall

coincide with the depth shown on the plans or to the depth directed; and payment lines for the slopes will be extended to a limit of 1 foot outside of and parallel to the slope lines shown on the plans, or as directed, to include rock actually removed within this limit. Where removal of rock is necessary for reasons of safety or due to conditions clearly not attributable to the Contractor's method of operation, the payment lines will be fixed to coincide with limits ordered by the Engineer.

Presplitting of bedrock performed in accordance with these specifications will not be measured for payment.

Where removal of rock is necessary for reason of safety or due to conditions clearly not attributable to the Contractor's methods of operation, the payment lines for rock excavation where presplitting is required will be fixed to coincide with limits ordered by the Engineer. Payment lines for Rock Excavation (No Explosives), where mechanical means of removal are required by these specifications, will extend to the slope and depth line(s) shown on the plans or as directed, to include only the rock actually removed within these limits.

Concrete and masonry foundation walls, or portions thereof, to be removed will be measured for payment by the volume in cubic yards, in place, before removal.

Existing concrete pavement and concrete base over 5 s.y., including any bituminous surfacing material immediately thereon, shall be measured in place before removal.

Existing concrete and cement masonry structures over 1 c.y., shall be measured in place before removal.

When rock is encountered, and its removal is to be paid for as "Rock Excavation" or "Channel Excavation—Rock," the Contractor shall strip or expose the rock to such an extent that in the Engineer's opinion the necessary measurements can be taken. The Contractor shall notify the Engineer at least 2 days prior to disturbing any of the rock to allow ample time to obtain the necessary measurements. If the Contractor shall fail to give such notice, or remove any rock prior to the taking of the measurements, the Engineer shall presume that measurements taken at the time the Engineer first sees the material in question will give a true quantity of excavation.

The amount of excavation will be determined by the average end area method, or by a method approved by the Engineer.

The work of scarifying existing pavement will not be measured for payment, but the cost shall be considered as included in the general cost of the Contract.

The work of cutting concrete pavement will be measured for payment by the number of linear feet of saw cut made with an approved concrete saw to the lines delineated by the Engineer on the concrete pavement.

The cutting of bituminous concrete pavement will be measured for payment by the number of linear feet of cut made by an approved method to the lines delineated on the plans or as directed by the Engineer.

Cuts made necessary by the Contractor's operation, such as, but not limited to, patching, bituminous concrete samples, continuance of previous runs, faulty work or faulty materials will not be measured for payment. Bituminous parking areas are considered as bituminous concrete pavement.

The work, materials, tools, equipment and labor incidental to the disposal of unsuitable excavated material or breaking concrete pavement will not be measured for payment.

In Article 2.02.05, revise the first paragraph as follows:

2.02.05—Basis of Payment: Roadway excavation will be paid for at the Contract unit price per cubic yard for "Earth Excavation," "Rock Excavation," "Rock Excavation (No Explosives)," "Channel Excavation—Earth," or "Channel Excavation—Rock" as the case may be, in accordance with the classification given herein and subject to the method of measurement described above. The price shall include all equipment, tools, compaction testing and labor incidental to the completion of the excavation, the formation and compaction of embankments, and the disposal of surplus or unsuitable material in accordance with the provisions of the plans and of these specifications.

**SECTION 2.03
STRUCTURE EXCAVATION**

In Article 2.03.03, revise Subarticle 6. Fill Adjacent to Structures as follows:

2.03.03—Construction Methods:

6. Fill Adjacent to Structures: All spaces excavated and not occupied by the abutments, piers, other permanent work or pervious structure backfill shall be filled to the surface of the surrounding ground with suitable material. Such backfill shall be thoroughly compacted and neatly graded.

Fill placed around arches, rigid frames, box culverts and piers shall be deposited on both sides of the structure to approximately the same elevation at the same time.

Each layer of backfill shall be spread to a thickness not exceeding 6 inches deep after compaction and shall be thoroughly compacted by the use of power rollers or other motorized vehicular equipment, by tamping with mechanical rammers or vibrators, or by pneumatic tampers. Any equipment not principally manufactured for compaction purposes or which is not in proper working order in all respects shall not be used within the area described above.

Special attention shall be given to compaction in places close to walls where motorized vehicular compaction equipment cannot reach. Within 3 feet of the back face of walls and within a greater distance at angle points of walls, each layer of backfill shall be compacted by mechanical rammers, vibrators or pneumatic tampers.

The dry density of each layer of backfill after compaction shall not be less than 95% of the maximum dry density for that material when determined by the Contractor in accordance with AASHTO T180 and measured in-place with ASTM D6938 or other methods approved by the Engineer.

The Contractor shall perform in-place density testing at a sufficient frequency to ensure that the specified results are continuously met. The Contractor shall submit complete field density testing and inspection records to the Engineer within 48 hours (excluding weekends and holidays) of the test in a manner acceptable to the Engineer.

Adequate provision shall be made for the drainage of all fill in accordance with the provisions of the plans, or as ordered by the Engineer.

No fill shall be placed against any structure until the Engineer has given permission to do so, and in no case until after the permitted time for removal of forms.

In Article 2.03.05, revise the first paragraphs of Subarticles (a) and (b) as follows:

2.03.05—Basis of Payment: Payment for this work will be made at the Contract unit price per cubic yard for:

(a) **Structure Excavation—Earth (complete) or "Structure Excavation—Rock (complete),"** whichever applies, in whole or in part, which price shall include all materials, tools, and equipment; all work related to cofferdams, including their design, construction, dewatering, repair, removal of obstructions, and any required reconstruction; all labor necessary to complete the excavation in accordance with the requirements of the plans or as ordered by the Engineer; the preparation of foundations as described under 2.03.03 including compaction testing; all necessary filling, except as otherwise provided in the Contract; and the removal of all surplus or unsuitable material resulting from the excavations. Any suitable surplus material shall be placed in the embankments, if so ordered by the Engineer, without additional compensation.

(b) **"Structure Excavation—Earth (excluding Cofferdam and Dewatering)" or "Structure Excavation—Rock (excluding Cofferdam and Dewatering),"** whichever applies in whole or in part, which price shall include all materials, tools, equipment and labor necessary to complete the excavations in accordance with the requirements of the plans or as ordered by the Engineer. It shall also include the preparation of foundations as described under 2.03.03 including compaction testing, the necessary filling, except as otherwise provided in the Contract, and the removal of all surplus or unsuitable material resulting from the excavations. Any suitable surplus material shall be placed in the embankments, if so ordered by the Engineer, without additional compensation.

**SECTION 2.04
COFFERDAM AND DEWATERING**

Replace Section 2.04 in its entirety with the following:

**SECTION 2.04
COFFERDAM AND DEWATERING
COFFERDAM MATERIAL LEFT IN PLACE**

2.04.01—Description: Work under this item shall consist of the design, construction, maintenance and removal of a cofferdam, and necessary dewatering within the cofferdam, as shown on the plans.

If designated on the plans, the installed cofferdam material shall be left in place.

For the purposes of this specification, cofferdam shall be understood to mean a structure, the type of which the Contractor elects to build, to fully enclose and confine an area to be pumped dry to enable construction to be carried out.

2.04.03—Materials: Sheet pile material left in place shall meet the requirements of ASTM A328.

2.04.03—Construction Methods: The Contractor shall submit to the Engineer cofferdam working drawings in accordance with 1.05.02. The Contractor's proposed design must meet all requirements established in regulatory permits for the Project, the requirements of 1.10, and any stage construction configurations.

1. Cofferdams: Construction of the cofferdam shall be carried to the height shown on the plans and to an adequate depth. The cofferdam shall be constructed so that the work within can be safely carried to the bottom of the structure excavation.

The interior dimensions of the cofferdam shall be sufficient for the unobstructed and satisfactory completion of all necessary substructure work, including but not limited to pile driving, form building, inspection and pumping.

The Contractor shall be responsible for maintenance of the cofferdam. If the cofferdam becomes tilted or displaced prior to the completion of all work to be done within, the cofferdam shall be righted, reset, or enlarged as may be necessary to provide the clearance for the unobstructed performance of all necessary work.

The cofferdam shall be completely dewatered as required to complete the work entirely in the dry, except as specified below.

When conditions are encountered that render it impractical to dewater the cofferdam, the Engineer may require the placing of underwater concrete of such dimensions as will be necessary to allow the Contractor to complete the work in the dry. The placement of underwater concrete shall comply with 6.01.03-6.

The cofferdam must be constructed to protect uncured masonry and concrete against damage from a sudden rising of the water and prevent damage to structure foundations by erosion. No part of the cofferdam which extends into the substructure may be left in place without written permission from the Engineer.

2. Dewatering: Pumping from the interior of any cofferdam shall be done in such a manner as to preclude the possibility of water moving through uncured masonry or concrete. During the placement of concrete or masonry, and for at least 24 hours thereafter, any pumping shall be done from a suitable sump located outside the horizontal limits and below the elevation of the work being placed or as directed by the Engineer.

The pumped water must be discharged in accordance with the requirements of 1.10. Pumping to dewater a cofferdam shall not start until any underwater concrete has sufficiently set to withstand the hydrostatic pressure created by pumping.

3. Removal of Cofferdam: Unless designated on the plans or directed by the Engineer, the Contractor shall remove all parts of the cofferdam and associated dewatering components after completion of the required work. This shall be done in such a way as not to disturb or otherwise damage any permanent construction.

4. Cofferdam Material Left in Place: Sheet piling used in constructing the cofferdam may be designated on the plans to be left in place. The sheet piling shall be cut off at elevations shown on the plans or approved in advance by the Engineer, and the cut off portions shall be removed from the Site by the Contractor.

2.04.04—Method of Measurement:

- 1. Cofferdam and dewatering will be measured for payment by the actual quantity installed and accepted, in linear feet along the centerline of the top of the cofferdam.
If the cofferdam becomes tilted or displaced prior to the completion of all work to be done within, the corrections and adjustments of the cofferdam will not be measured for payment.
- 2. Cofferdam material left in place will be measured for payment by the actual quantity of linear feet of material left in place and accepted by the Engineer.

2.04.05—Basis of Payment:

- 1. Cofferdam and Dewatering: Payment for this work will be made at the Contract unit price per linear foot for "Cofferdam and Dewatering," measured as described above, which price shall include all costs of design, materials, equipment, labor, work, and any related environmental controls used in dewatering operations, which are required for the construction of the cofferdam shown in the plans; of any repair, correction, adjustment or reconstruction of such cofferdam as required by the plans; removal of obstructions; pumping and dewatering; removal of such cofferdam and related environmental controls used in dewatering operations.

If the total number of linear feet of the cofferdam as accepted by the Engineer is greater than the quantity as designated on the original Contract plans, the Department will pay the Contractor for the revised quantity of such linear feet at the Contract unit price, subject to the provisions of 1.04.02 and 1.04.03.

If the Engineer allows the addition or enlargement of a cofferdam for the convenience or other benefit of the Contractor, but does not deem it essential for the performance of the Contract work, no additional payment will be made for the cofferdam or portion of the cofferdam which the Engineer does not deem essential.

- 2. Cofferdam Material Left in Place: In addition to Cofferdam and Dewatering, that portion of the cofferdam designated on the plans or ordered to be left in place will be paid for at the Contract unit price per linear foot for "Cofferdam Material Left in Place," which price shall include the cost of the sheet piling material left in place, the work to cut the sheet piling and removal of the cut off portions from the Site and all work incidental thereto.

Pay Item	Pay Unit
Cofferdam and Dewatering	l.f.
Cofferdam Material Left in Place	l.f.

**SECTION 2.07
BORROW**

In Article 2.07.04, replace the first paragraph with the following:

2.07.04—Method of Measurement: Except as provided under (a), (b), (c), (d) and (e) below, the amount of borrow to be paid for will be determined by using the results of cross-sectional elevations taken before and after the borrow material has been excavated from the pit or stockpile in the average end area method, or by a method approved by the Engineer. Measurements of stockpiles will not be taken until they are firm and can be measured safely and accurately.

SECTION 2.08
FREE-DRAINING MATERIAL

In Article 2.08.04, replace the first paragraph with the following:

2.08.04—Method of Measurement: The amount of free-draining material to be paid for will be determined by using the results of cross-sectional elevations taken before and after the free-draining material has been excavated in the average end area method, or by a method approved by the Engineer.

**SECTION 2.09
SUBGRADE**

In Article 2.09.01, revise the second paragraph as follows:

2.09.01—Description

Where precast concrete barrier curb or curbing is to be permanently installed, the work of formation of subgrade shall be performed on the area under the precast concrete barrier curb or curbing.

In Article 2.09.03, revise the only sentence in the third paragraph as follows:

The maximum dry density after compaction shall be as specified in 2.02.03-6.

In Article 2.09.05, revise the first paragraph as follows:

2.09.05—Basis of Payment: Formation and protection of subgrade, including all work provided for hereinbefore, will be paid for at the Contract unit price per square yard for "Formation of Subgrade," which price shall include all materials, equipment, tools, compaction testing and labor necessary thereto.

**SECTION 2.11
ANTI-TRACKING PAD**

Replace Articles 2.11.02 and 2.11.03 with the following:

2.11.02—Materials:

The crushed stone shall meet the gradation requirements of M.01.02 for No. 3 stone.

Geotextile filter fabric shall meet the requirements of 7.55 and M.08.01-19.

Topsoil, if necessary, shall meet the requirements of M.13.01.

Seed, if necessary, shall meet the requirements of M.13.04.

Fertilizer, if necessary, shall meet the requirements of M.13.03.

Mulch, if necessary, shall meet the requirements of M.13.05.

2.11.03—Construction Methods: Clear area of anti-tracking pad of all vegetation and excavate to a maximum depth of 4 inches. Place geotextile filter fabric over the full width and length of excavated area and cover with No. 3 crushed stone to a minimum depth of 6 inches.

The anti-tracking pad shall be uniformly graded to produce the entry and exit path to the Site for all construction equipment. The pad shall be maintained of sufficient grading and stone surface to capture all soils and sediment from equipment tires prior to such exiting from the Site.

Crushed stone shall be replenished or replaced as necessary or as ordered by the Engineer to assure sufficient capture of sediment at the construction Site. Any sediment or crushed stone tracked off the Site shall be immediately cleaned, swept and removed by the Contractor at no cost to the State.

**SECTION 2.12
SUBBASE**

Replace Article 2.12.03 with the following:

2.12.03—Construction Methods: The prepared foundation for the subbase shall be carefully shaped to the required cross-section and compacted. Where underdrains and outlets are specified on the plans or ordered by the Engineer, they shall be in place and functioning before any subbase material is placed.

The subbase material shall be spread uniformly upon the required grade, in courses not to exceed 6 inches thick after final compaction. However, if the required thickness of subbase does not exceed 8 inches it may be placed in a single course.

After each course has been placed as specified above, its entire area shall be compacted with equipment specifically manufactured for that purpose. The use of hauling and spreading equipment shall not be considered as a substitute for compacting equipment. Compaction shall be continued until the entire course is uniformly compacted to the required minimum density. The dry density after compaction shall not be less than 95% of the maximum dry density for that subbase material when determined by the Contractor in accordance with AASHTO T 180 and measured in-place with ASTM D6938 or other methods approved by the Engineer. If a subbase course is formed from reclaimed miscellaneous aggregate containing bituminous concrete, the wet density after compaction on this course shall not be less than 95% of the maximum wet density for that subbase when determined by the Contractor in accordance with AASHTO T180 and measured in-place with ASTM D6938 or other methods approved by the Engineer.

The Contractor shall perform in-place density testing at a sufficient frequency to ensure that the specified results are continuously met. The Contractor shall submit complete field density testing and inspection records to the Engineer within 48 hours (excluding weekends and holidays) of the test in a manner acceptable to the Engineer.

Should the foundation material beneath the subbase become churned up and mixed with subbase material at any time, the Contractor shall, without additional compensation, remove the mixture and replace it with new subbase material to the required thickness shown on the plans or as previously required by the Engineer. Such replaced subbase material shall be compacted to the required minimum density.

Replace Article 2.12.05 with the following:

2.12.05—Basis of Payment: This work will be paid at the Contract unit price per cubic yard for "Subbase," which price shall include all materials, equipment, tools, compaction testing and labor incidental thereto.

Pay Item	Pay Unit
Subbase	c.y.

**SECTION 2.14
COMPACTED GRANULAR FILL**

Replace Article 2.14.03 with the following:

2.14.03—Construction Methods: After all excavation has been completed, gravel or reclaimed miscellaneous aggregate shall be deposited in layers not exceeding 8 inches deep over the areas. In exceptional cases, the Engineer may permit the first layer to be thicker than 8 inches. Each layer shall be leveled off by the use of blade graders or bulldozers with adequate power for the work involved. The entire area of each layer shall be compacted by use of vibratory, pneumatic tire or tread type compaction equipment approved by the Engineer. The compaction shall be continued until the dry density over the entire area of each layer is not less than 95% of the maximum dry density for that material when determined by the Contractor in accordance with AASHTO T180 and measured in-place with ASTM D6938 or other methods approved by the Engineer.

If a layer is formed from reclaimed miscellaneous aggregate containing bituminous concrete, the wet density after compaction on this layer shall not be less than 95% of the maximum wet density for that compacted granular fill when determined by the Contractor in accordance with AASHTO T180 and measured in-place with ASTM D6938 or other methods approved by the Engineer.

The Contractor shall perform in-place density testing at a sufficient frequency to ensure that the specified results are continuously met. The Contractor shall submit complete field density testing and inspection records to the Engineer within 48 hours (excluding weekends and holidays) of the test in a manner acceptable to the Engineer.

The embankment adjacent to the compacted granular fill shall be placed simultaneously with the compacted granular fill, and at no time shall there be a difference of more than 2 feet in elevation between the classes of material. The embankment material to be placed simultaneously with the compacted granular fill shall extend at least 20 feet in every direction beyond the limits of the compacted granular fill, except that where a narrower width is shown on the plans, such narrower width of material shall be placed as prescribed above.

Replace Article 2.14.04 with the following:

2.14.04—Method of Measurement: Compacted granular fill will be measured in place after compaction, by the average end area method, or by a method approved by the Engineer.

Replace Article 2.14.05 with the following:

2.14.05—Basis of Payment: This work will be paid for at the Contract unit price per cubic yard for "Compacted Granular Fill," complete in place, which price shall include all materials, equipment, tools, compaction testing and labor incidental thereto.

The cost of water and work involved in puddling, admixtures and protective materials shall be included in the Contract unit price per cubic yard for "Compacted Granular Fill."

Pay Item	Pay Unit
Compacted Granular Fill	c.y.

**SECTION 2.16
PERVIOUS STRUCTURE BACKFILL**

Replace Articles 2.16.02, 2.16.03 and 2.16.05 with the following:

2.16.02—Materials: Pervious structure backfill shall meet the requirements of M.02.05.

The materials for bagged stone shall meet the following requirements:

1. The crushed stone or gravel shall meet the gradation requirements specified in Table M.01.02-2 for No. 3 or No. 4 coarse aggregate or a combination of both.
2. The bag shall be of permeable material sized to contain 1 c.f. of loosely packed granular material.

2.16.03—Construction Methods: Pervious structure backfill shall be placed adjacent to abutments, retaining walls, box culverts, and elsewhere as called for. It shall be placed above a plane extending on a 2 to 1 slope from the upper edge of the footing to the top of the embankment, or as shown on the plans. Where the face of undisturbed material is above or beneath this slope plane, the amount of pervious structure backfill shall be decreased or increased accordingly, if ordered by the Engineer.

In filling behind abutments, retaining walls, box culverts, or other structures, the fill is placed against undisturbed material, or against compacted embankments having a length in a direction at right angles to the abutment wall or culvert not less than twice the height of the structure against which the fill is placed. The slope of the embankment on which the pervious structure backfill is to be placed shall be plowed deeply or cut into steps before and during the placing of pervious structure backfill so both types of material will be thoroughly bonded and compacted.

Each layer of pervious structure backfill shall be spread to a thickness not exceeding 6 inches deep after compaction and shall be thoroughly compacted as directed by the Engineer by the use of power rollers or other motorized vehicular equipment, by tamping with mechanical rammers or vibrators, or by pneumatic tampers. Any equipment not principally manufactured for compaction purposes and equipment which is not in proper working order in all respects shall not be used within the area described above.

Special attention shall be given to compaction in places close to walls where motorized vehicular equipment cannot reach. Within 3 feet of the back face of walls and within a greater distance at angle points of walls, each layer of pervious structure backfill shall be compacted by mechanical rammers, vibrators, or pneumatic tampers.

The dry density of each layer of pervious structure backfill formed from broken or crushed stone, broken or crushed gravel or reclaimed miscellaneous aggregate free of bituminous concrete shall have a dry density after compaction that is not less than 98% of the maximum dry density for that material when determined by the Contractor in accordance with AASHTO T180 and measured in-place with ASTM D6938 or other methods approved by the Engineer.

If a layer formed from reclaimed miscellaneous aggregate containing bituminous concrete is placed as pervious structure backfill, the wet density of this layer after compaction shall not be less than 98% of the maximum wet density for that material when determined by the Contractor in accordance with AASHTO T180 and measured in-place with ASTM D6938 or other methods approved by the Engineer.

The Contractor shall perform in-place density testing at a sufficient frequency to ensure that the specified results are continuously met. The Contractor shall submit complete field density testing and inspection records to the Engineer within 48 hours (excluding weekends and holidays) of the test in a manner acceptable to the Engineer.

Where weep holes are installed, bagged stone shall be placed around the inlet end of each weep hole, to prevent movement of the pervious material into the weep hole. Approximately 1 c.f. of crushed stone or gravel shall be enclosed in each of the permeable material bags. All bags shall then be securely tied at the neck with cord or wire so that the enclosed material is contained loosely. The filled bags shall be stacked at the weep holes to the dimensions shown on the plans or as directed by the Engineer. The bags shall be unbroken at the time pervious material is placed around them, and bags which are broken or burst prior to or during the placing of the pervious material shall be replaced at the Contractor's expense.

2.16.05—Basis of Payment: Pervious structure backfill will be paid for the Contract unit price per cubic yard for "Pervious Structure Backfill," complete in place and the price shall include compaction testing.

There will be no direct payment for bagged stone, but the cost thereof shall be included in the cost of the work for "Pervious Structure Backfill."

Pay Item	Pay Unit
Pervious Structure Backfill	c.y.

**SECTION 3.04
PROCESSED AGGREGATE BASE**

Replace Articles 3.04.03 and 3.04.05 with the following:

3.04.03—Construction Methods: The same type of coarse aggregate shall be used throughout a Project unless otherwise permitted by the Engineer.

Prior to placing the processed aggregate base, the prepared subbase or subgrade shall be maintained true to line and grade, for a minimum distance of 200 feet in advance of the work. None of the aggregate courses shall be placed more than 500 feet ahead of the compaction and binding operation on that particular course.

The processed aggregate base shall be spread uniformly by a method approved by the Engineer. The thickness of each course shall not be more than 4 inches after compaction, unless otherwise ordered.

After the aggregate is spread, it shall be thoroughly compacted and bound by use of equipment specifically manufactured for that purpose. Rollers shall deliver a ground pressure of not less than 300 lb./in of contact width and shall have a weight not less than 10 tons. Vibratory units shall have a static weight of not less than 4 tons. Water may be used during the compaction and binding operation and shall be applied from an approved watering device. The compacting and binding operation shall begin at the outside edges, overlapping the shoulders for a distance of not less than 6 inches and progress towards the middle, parallel with the centerline of the pavement. The work shall cover the entire surface of the course with uniform overlapping of each preceding track or pass. Areas of super-elevation and special cross slope shall be compacted by beginning at the lowest edge and proceeding towards the higher edge, unless otherwise directed by the Engineer. The compacting and binding operation shall be continued until the voids in the aggregates have been reduced to provide a firm and uniform surface satisfactory to the Engineer. The amount of compactive effort shall in no case be less than 4 complete passes of the compacting and binding operations. All aggregate shall be completely compacted and bound at the end of each day's work or when traffic is to be permitted to operate on the road. The dry density of each layer of processed aggregate base after compaction shall not be less than 95% of the maximum dry density for that material when determined by the Contractor in accordance with AASHTO T180 and measured in-place with ASTM D6938 or other methods approved by the Engineer.

The Contractor shall perform in-place density testing at a sufficient frequency to ensure that the specified results are continuously met. The Contractor shall submit complete field density testing and inspection records to the Engineer within 48 hours (excluding weekends and holidays) of the test in a manner acceptable to the Engineer.

Should the subbase or subgrade material become churned up or mixed with the processed aggregate base at any time, the Contractor shall, without additional compensation remove the mixture. The Contractor shall add new subbase material, if required, and reshape and recompact the subbase in accordance with the requirements of 2.12.03. New aggregate material shall be added, compacted and bound, as hereinbefore specified, to match the surrounding surface.

Any surface irregularities which develop during, or after work on each course, shall be corrected by loosening material already in place and removing or adding aggregate as required. The entire area, including the surrounding surface, shall be re-compacted and rebound until it is brought to a firm and uniform surface satisfactory to the Engineer.

3.04.05--Basis of Payment: This work will be paid for at the Contract unit price per cubic yard for "Processed Aggregate Base," complete in place, which price shall include all materials, tools, equipment, compaction testing and work incidental thereto.

Pay Item	Pay Unit
Processed Aggregate Base	c.y.

STRUCTURES
SECTION 5.01
GENERAL CLAUSES

Delete Section 5.01 in its entirety.

**SECTION 5.03
REMOVAL OF AND ALTERATIONS TO
EXISTING BRIDGES**

Rename and replace Section 5.03 in its entirety as follows:

**SECTION 5.03
REMOVAL OF SUPERSTRUCTURE**

5.03.01—Description**5.03.02—Vacant****5.03.03—Construction Methods****5.03.04—Method of Measurement****5.03.05—Basis of Payment**

5.03.01—Description: This work shall include the full or partial removal and disposal of superstructure(s), as indicated on the plans.

5.03.02—Vacant**5.03.03—Construction Methods:****1. Submittals:**

The Contractor shall prepare and submit written procedures and working drawings, in accordance with 1.05.02. The submittals shall address the following:

- proposed equipment and removal method(s)
- operating and storage location(s) of equipment and materials
- containment and disposal of debris, including lead paint where required
- installation and removal of
 - a. debris shields
 - b. working platforms
 - c. falsework
- temporary support(s) for maintenance of traffic
- modification to and restoration of the structure to remain in place

2. Removal: Superstructures which are to be fully or partially removed by the Contractor shall be removed to the limits shown on the plans or as directed by the Engineer. Where components to be removed are designated on the plans for salvage, the Contractor shall carefully remove, preserve, deliver to and unload the components at the location specified in the Contract.

General removal may be performed by excavator-mounted demolition equipment or other methods except where prohibited on the plans or as directed by the Engineer.

If partial removal of concrete is required, it shall be sawcut to the neat lines as indicated on the plans. Near reinforcing steel that is to remain, the Contractor must use limited methods for removal, such as 15 pound hammers or other methods accepted by the Engineer.

Reinforcing steel shall be cut and removed where shown on the plans. Reinforcing steel to remain shall be cleaned of all concrete and corrosion products by oil-free abrasive blasting, high-pressure water blasting or other methods accepted by the Engineer. The reinforcing steel and concrete surfaces shall be free from dirt, oil, cement fines (slurry), or any material that may interfere with the bond of the proposed concrete. Tightly-bonded light rust on the reinforcing surface is acceptable.

Where staged construction requires concrete to be removed adjacent to the existing superstructure that will continue to support live load, the Contractor shall cut the concrete in accordance with the accepted working drawings.

When the existing structure is to carry traffic during the staged construction of the new work, the Contractor shall alter the structure as required by the plans. The structure and approaches shall be kept in a safe and satisfactory condition for the use of traffic at all times until the new structure is completed and open to traffic. The Contractor shall take all precautions and do such work as may be necessary to prevent damage to the structure or approaches due to the construction operations. When no longer required for traffic, the temporary alteration to the structure shall be removed in accordance with the requirements of the plans or as directed by the Engineer.

3. Disposal of Debris: The Contractor shall properly dispose of all construction debris either off-Site, or on-Site in accordance with 2.02.03-5.

4. Damage Mitigation: When removing the superstructure or a portion thereof, the Contractor shall take necessary precautions to prevent debris from dropping to areas below the superstructure, onto adjacent traffic lanes or onto adjacent property. Any damage to adjoining areas, including but not limited to new construction, public

utility installations, abutting property and to the portions of the structure that will remain shall be repaired by the Contractor in accordance with 1.05.11.

5.03.04—Method of Measurement: This work, being paid on a lump sum basis, will not be measured.

5.03.05—Basis of Payment: Prior to beginning work, the Contractor shall submit a proposed schedule of values for review and concurrence by the Engineer.

This work will be paid for at the Contract lump sum price for "Removal of Superstructure," at the location designated, which price shall include all equipment, tools and labor incidental to the full or partial removal of the superstructure (including saw cutting and the erection and removal of temporary falsework or supports of any kind) and shall include the proper disposal thereof.

Payment for the full or partial removal of bridge substructure(s) will be made at the Contract unit price per cubic yard for "Removal of Existing Masonry," in accordance with 9.74.05.

Pay Item	Pay Unit
Removal of Superstructure	l.s.

**SECTION 5.04
RAILROAD PROTECTION**

Replace Section 5.04 in its entirety with the following:

**SECTION 5.04
RAILROAD PROTECTION**

5.04.01—Description: This item shall consist of securing protective services of workers such as flagmen, electric traction linemen, inspectors, track foremen, signalmen, or other such protective services deemed necessary by a railroad engaged in or affected by the Project operations of the Contractor on, over, under or adjacent to the railroad's right-of-way. This item shall also include any material or equipment incidental to or required for the provision of such required protective services. The Contractor shall secure such services as are required by the railroad, and if said services are obtained from the railroad, the Contractor shall reimburse the railroad for them, in accordance with relevant Contract terms or with the railroad's customary terms for such transactions. The Contractor must understand that the railroad may require advance payment of all or a portion of the estimated costs for the services, in which case the Contractor shall make such advance payment.

5.04.02—Vacant

5.04.03—Vacant

5.04.04—Method of Measurement: Only Project-related protective services billed by the railroad and approved by the Engineer will be measured for payment. Protective services which the Engineer did not approve or deem necessary for the proper completion of the Project will not be measured for payment.

5.04.05—Basis of Payment: The sum of money for this item shown in the bid Estimate and in the itemized bid proposal as "Estimated Cost" for this work will be considered and treated as the bid price for it, even though payment for it will be made as described below. The estimated cost figure is not to be altered in any manner by the bidder. Should the bidder alter the amount shown, the altered figures will be disregarded and the original bid price will be used as the total amount for the Contract item. The Department will pay the Contractor for "Railroad Protection" at the actual hourly rate charged to the Contractor for railroad protection services approved by the Engineer (shown in the monthly statement or receipted bills to the Contractor from the entity that provided the actual services), plus a 5% markup. This price shall include all labor, material and equipment provided by a railroad for protective services required for Project operations.

Protective services used solely for the convenience or benefit of the Contractor shall be the legal and financial responsibility of the Contractor and will not be included in this item.

Final acceptance of the Project and resolution of financial Project obligations by the Department will be contingent upon the Contractor's providing the Department with proof that each railroad involved in the Project has been reimbursed for all necessary protective services provided by the railroad or that the Contractor has made some other arrangements satisfactory to said railroad(s) for such reimbursement.

Pay Item	Pay Unit
Railroad Protection	est.

**SECTION 6.03
STRUCTURAL STEEL**

*Replace Article 6.03.03-4(f), **High Strength Bolted Connections**, with the following
(to delete Direct Tension Indicator (DTI) washers as an acceptable method of checking tension):*

(f) High Strength Bolted Connections: The assembly of structural connections using ASTM A 325 or ASTM A 490 high-strength bolts shall be installed so as to develop the minimum required bolt tension specified in Table A. The Manufacturer's certified test report; including the rotational capacity test results must accompany the fastener assemblies. Fastener Assemblies delivered without the certified reports will be rejected.

Table A: Minimum Bolt Tension in kips*

Bolt Size (Inches)	ASTM A 325	ASTM A 490
5/8	19	24
3/4	28	35
7/8	39	49
1	51	64
1 1/8	56	80
1 1/4	71	102
1 3/8	85	121
1 1/2	103	148

*Equal to 70% of specified minimum tensile strength of bolts (as specified in ASTM Specifications for tests of full-size A 325 and A 490 bolts with UNC threads, loaded in axial tension) rounded to the nearest kip.

Bolts, nuts and washers from each rotational-capacity lot shall be shipped in the same container. If there is a single production lot number for each size of nut and washer, the nuts and washers may be shipped in separate containers. Each container shall be permanently marked with the rotational-capacity lot number such that identification will be possible at any stage prior to installation. Assemblies of bolts, nuts and washers shall be installed from the same rotational-capacity lot. Pins, small parts and packages of bolts, washers, and nuts shall be shipped in boxes, crates, kegs, or barrels. A list and description of the contained materials shall be plainly marked on the outside of each shipping container.

Bolted Parts: All material within the grip of the bolt shall be steel; there shall be no compressible material, such as gaskets or insulation, within the grip. Bolted steel shall fit solidly together after the bolts are tensioned. The length of the bolts shall be such that the end of the bolt will be flush with or outside of the face of the nut when properly installed.

Surface Conditions: At the time of assembly, all connection surfaces, including surfaces adjacent to the bolt head and nut, shall be free of scale, except tight mill scale, and shall be free of dirt or other foreign material. Burrs that would prevent solid seating of the connected parts in the snug tight condition shall be removed.

Paint is permitted on the faying surface, including slip critical connections, only when shown on the plans. The faying surfaces of slip-critical connections shall meet the requirements of the following paragraphs, as applicable:

1. Connections specified to have uncoated faying surfaces: any paint, including any inadvertent over spray, shall be excluded from areas closer than 1 bolt diameter, but not less than 1.0 in, from the edge of any hole and all areas within the bolt pattern.
2. Connections specified to have painted faying surfaces shall be blast cleaned and coated in accordance with the Contract, and shall not be assembled until the coating system has been properly cured.
3. Connections specified to have galvanized faying surfaces shall be hot-dip galvanized in accordance with ASTM A 123, and shall subsequently be roughened by means of hand wire brushing. Power wire brushing is not permitted.

Installation: At the pre-erection meeting, the Contractor shall inform the Engineer of its planned method of tensioning high strength bolts. Acceptable methods are:

1. Turn-of-Nut
2. Calibrated Wrench

Fastener Assemblies: A "fastener assembly" is defined as a bolt, a nut, and a washer. Only complete fastener assemblies of appropriately assigned lot numbers shall be installed.

Fastener assemblies shall be stored in a sheltered area protected from dirt and moisture. Only as many fastener assemblies as are anticipated to be installed and tensioned during a work shift shall be taken from protected storage. Fastener assemblies not used shall be returned to protected storage at the end of the shift. Prior to installation, fastener assemblies shall not be cleaned of lubricant. Fastener assemblies which accumulate rust or dirt resulting from site conditions shall be cleaned, relubricated and tested for rotational-capacity prior to installation. All galvanized nuts shall be lubricated with a lubricant containing a visible dye. Plain bolts must be oily to the touch when delivered and installed. Lubricant shall be removed prior to painting.

All bolts shall have a hardened washer under the turned element (nut or bolt head). All hardened washers shall conform to the requirements of ASTM F436.

Where necessary, washers may be clipped on 1 side to a point not closer than 7/8 of the bolt diameter from the center of the washer.

Bolt Tension Measuring Device: The Contractor shall provide a calibrated bolt tension measuring device (a Skidmore-Wilhelm calibrator (Skidmore) or other acceptable bolt tension indicating device) at all times when, and at all locations where high-strength fasteners are being installed and tensioned. The tension measuring device (Skidmore) shall be calibrated by an approved testing agency at least annually. The Skidmore shall be used to perform the rotational-capacity test of the fastener assemblies. The Skidmore will also be used to substantiate

- (1) the suitability of the fastener assembly to satisfy the requirements of Table A, including lubrication as required,
- (2) calibration of the installation wrenches, if applicable, and
- (3) the understanding and proper use by the Contractor of the selected method of tensioning to be used.

Complete fastener assemblies shall be installed in properly aligned holes and then tensioned by the Turn-of-Nut or Calibrated Wrench method to the minimum tension specified in Table A. Tensioning may be done by turning the bolt while the nut is prevented from rotating when it is impractical to turn the nut. Impact wrenches, if used, shall be of adequate capacity and sufficiently supplied with air to perform the required tensioning of each bolt in approximately 10 seconds.

Bolts shall be installed in all holes of the connection and the connection brought to a snug condition. Snug is defined as having all the plies of the connection in firm contact. Snugging shall progress systematically from the most rigid part of the connection to the free edges. The bolts of the connection shall then be tightened in a similar manner as necessary until the connection is properly tensioned.

Nuts shall be located, whenever practical, on the side of the connection which will not be visible from the traveled way.

Unless otherwise approved by the Engineer fastener assemblies shall be brought to full tension immediately following snugging.

Fully tensioned fastener assemblies shall not be reused. Retightening previously tensioned bolts which may have been loosened by the tensioning of adjacent bolts shall not be considered as reuse.

Rotational-Capacity Tests: In addition to the certified test reports, on site Rotational-capacity tests may be required by the Engineer. This test shall be performed by the Contractor at the location where the fasteners are installed and tensioned. When performed in the field, the procedure shall meet the requirements of ASTM A 325 Appendix A-1.

Turn-of-Nut Installation Method: At the start of the work, the Contractor shall demonstrate that the procedure used by the bolting crew to develop a snug condition and to control the turns from a snug condition develops the tension required in Table A. To verify their procedure, the Contractor shall test a representative sample of not less than 3 complete fastener assemblies of each diameter, length and grade to be used in the work. This shall be performed at the start of work using a Skidmore. Periodic retesting shall be performed when ordered by the Engineer.

After snugging the connection, the applicable amount of rotation specified in Table B shall be achieved.

During the tensioning operation there shall be no rotation of the part not turned by the wrench.

Tensioning shall progress systematically from the most rigid part of the connection to its free edges.

**TABLE B: Nut Rotation from the Snug Condition
Geometry^{a,b,c} of Outer Faces of Bolted Parts**

Bolt Length (measured from underside of head to end of bolt)	Both Faces Normal to Bolt Axis	One Face Normal to Bolt Axis and Other Face Sloped Not More Than 1:20, Bevel Washer Not Used	Both Faces Sloped Not More Than 1:20 From Normal to Bolt Axis, Bevel Washer Not Used
Up to and including 4 diameters	1/3 turn	1/2 turn	2/3 turn
Over 4 diameters but not exceeding 8 diameters	1/2 turn	2/3 turn	5/6 turn
Over 8 diameters but not exceeding 12 diameters	2/3 turn	5/6 turn	1 turn

- (a) Nut rotation, as used in Table B, shall be taken as relative to the bolt, regardless of the element (nut or bolt) being turned. For bolts installed by 1/2 turn and less, the tolerance should be plus or minus 30 degrees; for bolts installed by 2/3 turn and more, the tolerance should be plus or minus 45 degrees.
To determine the nut rotation for installation and inspection of the fasteners, the nut and the end of the bolt or the head of the bolt and the adjacent steel shall be match marked.
- (b) The values, given in Table B, shall be applicable only to connections in which all material within grip of the bolt is steel.
- (c) No research work has been performed by the Research Council on Riveted and Bolted Structural Joints to establish the turn-of-nut procedure when bolt lengths exceed 12 diameters. For situations in which the bolt length, measured from the underside of the head to the end of the bolt, exceeds 12 diameters, the required rotation shall be determined by actual tests in a suitable tension device simulating the actual conditions.

Calibrated Wrench Installation Method: Calibrated wrench method may be used only when the installation wrenches are properly calibrated daily, or as determined by the Engineer. Standard torques determined from tables or from formulas which are assumed to relate torque to tension shall not be acceptable.

The Contractor shall demonstrate to the Engineer periodically that all equipment and wrenches are providing a torque which has been calibrated to produce the minimum tension specified in Table A. The installation procedures shall be verified periodically, as determined by the Engineer, for each bolt diameter, length and grade using the fastener assemblies that are being installed in the work. This verification testing shall be accomplished in a Skidmore by tensioning 3 complete fastener assemblies of each diameter, length and grade from those being installed with a hardened washer under the element turned.

When significant difference is noted in the surface condition of the bolts, threads, nuts or washers, as determined by the Engineer, wrenches shall be recalibrated. The Contractor shall verify during the installation of the assembled steel work that the wrench adjustment selected by the calibration does not produce a nut or bolt head rotation from snug greater than that permitted in Table B. If manual torque wrenches are used, nuts shall be turned in the tensioning direction when torque is measured.

When calibrated wrenches are used to install and tension bolts in a connection, bolts shall be installed with hardened washers under the element turned to tension the bolts. Once the connection has been snugged, the bolts shall be tensioned using the calibrated wrench. Tensioning shall progress systematically from the most rigid part of the connection to its free edges. A calibrated torque wrench shall be used to "touch up" previously tensioned bolts which may have been relaxed as a result of the subsequent tensioning of adjacent bolts until all bolts are tensioned to the prescribed amount.

Inspection: The Contractor shall provide all the material, equipment, tools and labor necessary for the inspection of the bolted connections. Access to the bolted parts and fastener assemblies, both before and after the fasteners are installed and tensioned, shall be provided.

The Contractor is responsible for Quality Control (QC). The Contractor shall review this specification with its Project personnel prior to performing the work. The Contractor shall verify the proper markings, surface conditions and storage of fastener assemblies. The Contractor shall inspect the faying surfaces of connections for compliance with the plans and specifications. The Contractor shall

provide to the Engineer a copy of their written QC report for each shift of the calibration or verification testing specified. This report shall confirm that the selected procedure is properly used and that the fastener assemblies installed meet the tensions specified in Table A. The Contractor shall monitor the installation of fasteners in the work to assure that the selected procedure, as demonstrated in the initial testing to provide the specified tension, is routinely and properly applied.

The Contractor, in the presence of the Engineer, shall inspect the tensioned bolts using an inspection torque wrench, as defined below.

Inspection tests shall be performed within 24 hours of bolt tensioning to prevent possible loss of lubrication or corrosion influence on tensioning torque.

The inspection torque wrench shall be calibrated as follows: Three (3) bolts of the same grade, size, and condition as those under inspection shall be placed individually in a device calibrated to measure bolt tension. This calibration operation shall be done at least once each inspection day. There shall be a washer under the part turned in torquing each bolt. In the calibrated device, each bolt shall be tightened by any convenient means to the specified tension. The inspection wrench shall then be applied to the tensioned bolt to determine the torque required to turn the nut or head 5 degrees in the tightening direction. The average of the torque required for all 3 bolts shall be defined as the job-inspection torque.

Twenty-five percent (25%), but a minimum of 2, of the tensioned bolts shall be selected by the Engineer for inspection in each connection. (The Engineer may reduce the number of bolts tested at a connection to 10% based on the Contractor's past performance and splice location .) The job-inspection torque shall then be applied to each selected assembly with the inspection torque wrench turned in the tightening direction. If all inspected bolt heads or nuts do not turn, the bolts in the connection shall be considered to be properly tensioned. If the torque turns 1 or more bolt heads or nuts, the job-inspection torque shall then be applied to all bolts in the connection or to the satisfaction of the Engineer. Any bolt whose head or nut turns shall be re-tensioned and re-inspected. The Contractor may, however, re-tension all the bolts in the connection with the inspection torque wrench and resubmit it for inspection, so long as the bolts are not over-tensioned or damaged by this action.

**SECTION 7.02
PILES**

In Subarticle 7.02.03-1(a) Timber Piles, replace the first paragraph with the following:

7.02.03—Construction Methods:**1. Pile Types:**

(a) Timber Piles: The method of storing and handling timber piles shall be in accordance with AWWA M4 Standards. Special care shall be taken to avoid damaging the surface of treated piles. Cant dogs, hooks, or pile-poles shall not be used. Cuts or breaks in the surface of treated piling shall be addressed by the Contractor.

**SECTION 8.03
PAVED DITCHES AND CHANNELS**

Replace Section 8.03 in its entirety with the following:

**SECTION 8.03
PAVED DITCHES, PAVED APRONS AND
PAVED CHANNELS**

- 8.03.01—Description**
- 8.03.02—Materials**
- 8.03.03—Construction Methods**
- 8.03.04—Method of Measurement**
- 8.03.05—Basis of Payment**

8.03.01—Description: The work under this item includes placing and compacting of a bituminous concrete course on a pre-excavated foundation forming paved ditches, aprons or channels in accordance with the line, grade, compacted final thickness and typical cross-section shown on the plans.

8.03.02—Materials: The materials for this work shall meet the following requirements:
Bituminous Concrete Curb Mix shall meet the requirements of 4.06 and M.04.01.
Processed Aggregate Base shall meet the requirements of M.05.01.

8.03.03—Construction Methods: The processed aggregate base course shall be placed in a single course, 4 inches compacted thickness, in accordance with 3.04.03. The surface shall be a 2 inch course of bituminous concrete curb mix. The bituminous concrete shall be placed and thoroughly compacted with compaction equipment suitable for small areas.

8.03.04—Method of Measurement: The quantity to be measured for these items will be the surface area in square yards of paved ditch, paved apron or paved channel constructed and accepted.
Formation of Subgrade and Processed Aggregate Base will not be measured for payment.

8.03.05—Basis of Payment: This work will be paid for at the Contract unit price per square yard for "Paved Ditch," "Paved Apron" or "Paved Channel." The price shall include all materials, tools, equipment and work incidental thereto.

Excavation will be paid for in accordance with 2.06.
Bituminous Concrete Lip Curbing for Paved Channels will be paid for in accordance with 8.15.

Pay Item	Pay Unit
Paved Ditch	s.y.
Paved Apron	s.y.
Paved Channel	s.y.

**SECTION 8.11
CONCRETE CURBING**

Replace Section 8.11 in its entirety with the following:

**SECTION 8.11
CONCRETE CURBING**

8.11.01—Description: This item shall consist of concrete curbing, furnished in accordance with the dimensions and details of the plans, and installed to the lines and grades shown on the plans.

8.11.02—Materials: All concrete curbing shall be constructed with Class "F" concrete as defined in M.03.02.

Precast curbing shall meet the requirements of M.08.02-4.

Joint filler shall meet the requirements of M.03.08-2.

Base material, if required, shall meet the requirements of M.02. 01, M.02.02 or M.05.01.

8.11.03—Construction Methods: Construction methods shall meet the requirements of 6.01.03, as supplemented by the following:

1. Excavation: Excavation shall be made to the required depth, and the base upon which the curbing is to be set shall be compacted to a firm, even surface.

2. Section Lengths and Joints: All straight curbing sections shall be uniform length and a minimum of 8 feet.

Curved curb section lengths may vary with radii of curves.

When a gap of less than 8 feet is required for closure, the length of curbing may be varied, but no section less than 2 feet will be permitted.

For both precast and cast-in-place concrete curbing, a 1/2 inch joint shall be filled with joint filler at intervals of approximately 50 feet; and contraction joints shall be placed at intervals of approximately 15 feet.

3. Cast-In-Place Curbing: Forms shall be clean and founded on a moist, firm, unfrozen base and the curbing shall be constructed so that the exposed faces may be accessed before the concrete has taken final set to allow finishing. Cast-in-place curbing shall be finished in accordance with 6.01.03-10(b).

4. Precast Concrete Curbing: The Contractor shall stabilize the precast concrete curbing during installation until backfilling is complete.

Precast curbing set on a radius of 50 feet or less shall be fabricated to the required radius within the manufacturer's tolerance.

5. Backfilling: The backfill shall consist of approved material placed in 6 inch layers and each layer shall be thoroughly compacted. The final elevation of the backfill shall match the lines shown on the plans, or as ordered by the Engineer.

8.11.04—Method of Measurement: This work will be measured for payment along the top of the curb and will be the actual number of linear feet of concrete curbing completed and accepted.

8.11.05—Basis of Payment: Payment for this work will be made at the Contract unit price per linear foot for "Concrete Curbing" of the type specified, complete and accepted in place, which price shall include all excavation, materials, equipment, tools, backfilling, disposal of surplus material, and labor incidental thereto.

There will be no direct payment for furnishing, placing and compacting base material, but the cost of this work shall be considered as included in the general cost of the work.

Pay Item	Pay Unit
Concrete Curbing (Type)	l.f.

**SECTION 8.13
STONE CURBING**

Replace Section 8.13 in its entirety with the following:

**SECTION 8.13
STONE CURBING**

8.13.01—Description: This item shall consist of stone curbing, furnished in accordance with the dimensions and details of the plans, and installed to the lines and grades shown on the plans.

8.13.02—Materials: The stone curbing shall meet the requirements of M.12.06.

The mound of concrete required at all stone curbing joints shall meet the requirements of any mix design type listed in Table M.03.02-1.

Mortar shall meet the requirements of M.11.04.

Base material, if required, shall meet the requirements of M.02.01, M.02.02 or M.05.01.

8.13.03—Construction Methods:

1. Excavation: Excavation shall be made to the required depth and the base upon which the curbing is to be set shall be compacted to a firm, even surface.

2. Section Lengths and Joints: For straight curbing, approximately 80% of the stones shall be furnished in lengths of not less than 6 feet and the remaining 20% in lengths of not less than 4 feet, interspersed at random in order to allow for closures.

Curved curb section lengths may vary with radii of curves, but no section less than 2 feet will be permitted.

The space between each section of curbing shall be 1/2 inch and shall be pointed with mortar for the full depth of the curbing. At uniform intervals of approximately 50 feet, one joint shall be left unfilled

A mound of concrete, as shown on the plans, shall be placed at each joint prior to placing sections adjacent to the joint.

Break back of stone curbing shall be as shown on the plans.

The ends of the curbing at driveways and intersections shall be cut at a bevel or rounded, as directed by the Engineer.

3. Curved Stone Curbing: This shall be defined as curbing set on a radius of 100 feet or less and shall be fabricated to the required radius within the manufacturer's tolerance.

4. Backfilling: The backfill shall consist of approved material placed in 6 inch layers and each layer shall be thoroughly compacted. The final elevation of the backfill shall match the lines shown on the plans, or as ordered by the Engineer.

8.13.04—Method of Measurement: This work will be measured for payment along the top of the curb and will be the actual number of linear feet of stone curbing or curved stone curbing completed and accepted.

8.13.05—Basis of Payment: Payment for this work will be made at the Contract unit price per linear foot for "Stone Curbing" or "Curved Stone Curbing," of the type and size specified, complete and accepted in place, which price shall include all excavation, materials, equipment, tools, backfilling, disposal of surplus material and labor incidental thereto.

There will be no direct payment for furnishing, placing and compacting base material, beveling or rounding the ends of the curbing and pointing the joints with mortar, but the cost of this work shall be considered as included in the general cost of the work.

Pay Item	Pay Unit
Stone Curbing (Type-Size)	l.f.
Curved Stone Curbing	l.f.

**SECTION 8.16
GRANITE SLOPE CURBING**

Delete Section 8.16 in its entirety.

**SECTION 9.06
WIRE FENCE**

Replace Section 9.06 in its entirety with the following:

**SECTION 9.06
WIRE FENCE**

9.06.01—Description: Work under this item shall consist of furnishing and installing wire fence with wood or metal posts as shown on the plans.

9.06.02—Materials: Materials for this work shall meet the requirements of M.10.04. Concrete or grout, with the permission of the Engineer, may be hand mixed.

9.06.03—Construction Methods: Wire fence posts shall be set plumb and to the lines and grades shown on the plans. Posts shall be set in holes, and the area adjacent to the posts shall be backfilled with suitable material and thoroughly compacted. Any surplus or unsuitable material remaining after the completed installation shall be removed and disposed of by the Contractor. The Contractor is cautioned that underground utilities, which may be energized, may be present within the Project limits.

If an obstruction is encountered while driving or placing the metal or wood post, the Contractor shall notify the Engineer who will determine whether the obstruction shall be removed, the post or posts relocated, or the metal post in rock detail shall apply. Backfill shall be thoroughly tamped after the posts have been set plumb.

All end, corner and brace posts shall be set in concrete footings as shown on the plans. Braces shall be fastened to the post as shown on the plans.

1. Wire Fence with Wood Posts: For wire fence with wood posts the posts shall be set butt end down. The wire fencing shall be placed on the side of the posts facing the roadway. It shall be attached to the wood posts by wire staples. The fencing shall be stretched taut and fastened to the posts at each horizontal wire. Wood braces shall be fastened to notches in the posts to hold them firmly when the wire is pulled tight.

When exposed ledge rock is encountered, the fence shall be attached to metal posts which shall be set in a 6 inch minimum diameter hole drilled into the rock at least 12 inches deep and shall be grouted in correct position.

2. Wire Fence with Metal Posts: For wire fence with metal posts the line post shall be set with anchor plate at the bottom. On metal line posts set in rock, the anchor plate shall be omitted.

Steel posts shall be driven using suitable driving caps to prevent damage to the posts. When exposed ledge rock is encountered, the metal posts shall be set in a 6 inch minimum diameter hole drilled into the rock at least 12 inches deep and shall be grouted in correct position.

Adjustable brace bands shall be fastened to the metal corner, end and brace posts as shown on the plans.

9.06.04—Method of Measurement: This work will be measured for payment by the number of linear feet of completed and accepted wire fence measured from outside to outside of end posts.

9.06.05—Basis of Payment: This work will be paid for as follows:

1. Wire Fence with Wood Posts: This work will be paid for at the Contract unit price per linear foot for "Wire Fence with Wood Posts," complete in place, which price shall include all excavation, backfilling, materials, equipment, tools, labor, disposal of any surplus material and work incidental thereto.

No additional compensation will be made for furnishing and installing metal fence posts where required or for the drilling and grouting necessary to place them.

2. Wire Fence with Metal Posts: This work will be paid for at the Contract unit price per linear foot for "Wire Fence with Metal Posts," complete in place, which price shall include all excavation, backfilling, materials, equipment, tools, labor, disposal of any surplus material and work incidental thereto.

Pay Item	Pay Unit
Wire Fence with Wood Posts	l.f.
Wire Fence with Metal Posts	l.f.

**SECTION 9.08
FARM WALL FENCE**

Delete Section 9.08 in its entirety.

SECTION 9.10
METAL BEAM RAIL

Change the last sentence of Article 9.10.03 as follows:

“ Before final erection, all galvanized elements which have been cut or worked so as to damage the zinc coating and cause the base metal to be exposed shall have the exposed base metal thoroughly cleaned and brush coated with 2 coats of zinc-rich touch-up material.”

Replace Articles 9.10.04 and 9.10.05 with the following:

9.10.04—Method of Measurement:

1. Metal Beam Rail (Type): The length of metal beam rail measured for payment will be the number of linear feet of accepted rail of the type or designation installed, including radius rail other than Curved Guide Rail Treatment, measured along the top of rail between centers of end posts in each continuous section.

2. Metal Beam Rail Span Section (Type II or III): Metal Beam Rail Span Section (Type II or III) measured for payment will be the actual number of each type accepted and installed in accordance with the “Pay Limit” shown on the plans.

3. (Type) Attachment: The number of rail attachments to bridge parapets, barriers or other fixed objects measured for payment will be the actual number of accepted attachments of each type or designation installed in accordance with the “Pay Limit for Attachment” shown on the plans.

4. Convert Metal Beam Rail (Type) to (Type): The conversion of existing metal beam rail (Type) to the (Type) specified will be measured for payment by the number of linear feet of rail installed measured along the top of rail between centers of end posts in each continuous section. If a new end anchorage for the converted rail is needed, it shall be measured for payment in accordance with 9.11.

5. (Type) Curved Guide Rail Treatment: The (Type) Curved Guide Rail treatment measured for payment will be the actual number of each type installed and accepted in accordance with the "Pay Limit Curved Guide Rail Treatment" shown on the plans.

9.10.05—Basis of Payment:

1. Metal Beam Rail (Type): This work will be paid for at the Contract unit price per linear foot for the type or designation indicated on the plans or ordered by the Engineer, complete in place. Prices shall include all materials, posts of all lengths, equipment, tools, removal and disposal of surplus material, and labor incidental to the installation of the rail.

2. Metal Beam Rail Span Section (Type II or III): This work will be paid for at the Contract unit price each for the types specified on the plans complete in place. Prices shall include all materials, equipment, tools, removal and disposal of surplus material, backfilling, and labor incidental to the installation of the rail.

3. (Type) Attachment: This work will be paid for at the Contract unit price each for the type of attachment complete in place. The price shall include all materials, drilling & grouting including anchor bolts, removal of existing rail system, removal and disposal of surplus material, equipment, tools, and labor incidental to the installation of the attachment.

4. Convert Metal Beam Rail (Type) to (Type): The conversion of existing metal beam rail will be paid for at the Contract unit price per linear feet for the type shown on the plans complete in place. The price shall include all materials (excluding new parts for damaged or missing parts), backfilling, punching or drilling of holes in existing posts, removal and resetting of existing railing, removal of the end anchorages where indicated on the plans, removal and disposal of surplus material, equipment, tools and labor incidental to the conversion of the existing rail. Surplus material not needed for the conversion, unless specified otherwise in the Contract, shall become the property of the Contractor.

Payment for new parts approved by the Engineer, which replace damaged or missing parts will be paid for at the applicable Contract unit prices, or in their absence, in accordance with 1.04.05.

5. (Type) Curved Guide Rail Treatment: This work will be paid for at the Contract unit price for each type indicated or as ordered by the Engineer, complete in place. The price shall include all materials, excavation, backfilling, removal and disposal of surplus material, equipment, tools and labor incidental to the installation of the rail treatment.

Drilling in or removal of rock or boulders and backfilling with suitable material when required for the

installation of posts will be paid for in accordance with 1.04.05, unless an item for the removal of rock appears in the Contract.

Payment for temporary terminations for metal beam rail and galvanized coating touch-up will be included in the general cost of the work.

Pay Item	Pay Unit	
Metal Beam Rail (Type)	l.f.	
Metal Beam Rail Span Section (Type II or III)	ea.	
(Type) Attachment	ea.	
Convert Metal Beam Rail (Type) to (Type)	l.f.	
(Type) Curved Guide Rail Treatment	ea.	

**SECTION 9.13
CHAIN LINK FENCE**

Replace Article 9.13 in its entirety with the following:

9.13.01—Description**9.13.02—Materials****9.13.03—Construction Methods****9.13.04—Method of Measurement****9.13.05—Basis of Payment**

9.13.01—Description: Work under this item shall consist of furnishing and installing or removing chain link fence and gates of the type and height specified on the plans.

9.13.02—Materials: The fence materials for this work shall meet the requirements of M.10.05. Concrete footings shall be Portland cement concrete, minimum compressive strength of 3,300 psi, as defined in M.03.02. Where posts are to be grouted into rock, the grout shall meet the requirements of M.03.05.

9.13.03—Construction Methods: Chain link fence posts shall be spaced in line of fence not further than 10 feet on centers. Intermediate or line posts, may be driven by mechanical means. A suitable driving cap shall be used to ensure that no damage is caused to the post, galvanization or polyvinyl chloride coating. Posts not driven, and all other type posts shall be set in Portland cement concrete acceptable to the Engineer.

Concrete footings shall extend a minimum of 4 inches below the bottom of the post. The footing diameter shall be 12 inches for terminal, corner, pull or brace posts. All tops of concrete footings shall be crowned to shed water.

When ledge rock is encountered, the posts shall be set in 6 inch minimum diameter holes drilled into rock to a minimum 12 inches deep and shall be grouted in correct position.

All fence end posts shall be braced. Braces shall be installed at 100 foot intervals to maintain tension. Corner posts shall be braced at each change in direction.

Brace posts with 2 braces shall be provided for all heights where changes in horizontal or vertical alignment of 10 degrees or more occur.

Where additional braces are required, they shall be spaced as indicated on the plans.

Where a top rail is used, it shall pass through the line post loop cap and form a continuous brace from end to end of fence. The rail shall be provided with sleeve connectors approximately every 20 feet. The sleeve connectors shall be at least 7 inches long.

Fabric shall be fastened to line posts with tie wires spaced approximately 12 inches apart. The fabric shall be fastened to the top rail with tie wires spaced approximately 18 inches apart.

If a top rail is not specified, a top tension wire shall be provided. The tension wire shall be a continuous length between pull posts. Sufficient tension shall be applied to provide a wire without a visible sag between posts. Tension wires shall be tied or otherwise fastened to end, gate, corner or pull posts by a method acceptable to the Engineer. Hog rings shall be provided for attaching the tension wire to the fabric at intervals not exceeding 18 inches.

Where it is not practicable to conform the fence to the general contour of the ground, as at ditches, channels, etc., the opening beneath the fence shall be enclosed with chain link fabric and sufficiently braced to preclude access, but not to restrict the flow of water.

Fabric shall be fastened to the end of the gate frames by tension bars and tension bands, and to the top and bottom of the gate frames by tie wires in the same manner as specified for the chain link fence fabric.

The drop bar locking device for the gate shall be provided with a footing of Portland cement concrete crowned at the top to shed water and provided with a hole to receive the locking bar. A heavy-duty padlock with 2 keys shall be furnished by the Contractor for each gate. The size of the footing and depth of penetration of the locking bar into the footing shall be as shown on the plans.

Where indicated, the removal of existing chain link fence and gate shall be to the nearest post as shown on the plans. If any existing fence is to remain, the new terminal post shall be modified to ensure proper bracing as directed by the Engineer. Chain link mesh shall be disconnected and secured to the terminal post using appropriate hardware.

If the fence post being removed is located in pavement or concrete, the Contractor shall fill all holes with

non-shrink grout. Concrete footings shall be removed and backfilled unless directed otherwise by the Engineer.

9.13.04—Method of Measurement: Chain link fence will be measured for payment by the number of linear feet of completed and accepted chain link fence or polyvinyl chloride chain link fence of the height specified, measured from outside to outside of terminal posts.

Gates will be measured for payment by the number of gates installed, of the type and size specified, completed and accepted.

Removal of chain link fence will be measured for payment by the number of linear feet of chain link fence and gate removed, including posts and bracing, measured from outside to outside of terminal posts.

9.13.05—Basis of Payment: Chain link fence work will be paid for at the Contract unit price per linear foot for "Chain Link Fence" or "Polyvinyl Chloride Chain Link Fence" of the height specified, complete in place, which price shall include all materials, equipment, tools, excavation, backfill, concrete, grout, disposal of surplus material and labor incidental thereto.

Gate work will be paid for at the Contract unit price each for "Chain Link Gate" or "Polyvinyl Chloride Chain Link Gate" of the type and size specified, complete in place, which price shall include gate frame, gate posts, chain link fabric, lock, concrete, excavation, backfill, fabrication, installation, disposal of surplus material, and all materials, equipment, tools, labor and any work incidental thereto.

Removal of chain link fence work will be paid for at the Contract unit price per linear foot for "Remove Chain Link Fence." The price shall include removal and disposal of posts, footings, fence fabric, gates, excavation, backfill, equipment, tools, labor, and any work incidental thereto.

Pay Item	Pay Unit
(Height) Chain Link Fence	l.f.
(Height) Polyvinyl Chloride Chain Link Fence	l.f.
(Type) (Size) Chain Link Gate	ea.
(Type) (Size) Polyvinyl Chloride Chain Link Gate	ea.
Remove Chain Link Fence	l.f.

**SECTION 9.25
PAVEMENT FOR RAILING**

Delete Section 9.25 in its entirety.

**SECTION 9.44
TOPSOIL**

Replace Articles 9.44.02, 9.44.03 and 9.44.05 with the following:

9.44.02—Material: The material shall meet the requirements of M.13

9.44.03—Construction Methods: Any material delivered to the Project, which does not meet the proper pH requirements for that soil must be amended on Site prior to final acceptance.

The areas on which topsoil is to be placed shall be graded to a reasonably true surface. Topsoil shall then be spread and shaped to the lines and grades shown on the plans, or as directed by the Engineer. The required depth to which the topsoil is to be placed is to be the depth after settlement of the material has taken place. All stones, roots, debris, sod, weeds and other undesirable material shall be removed. After shaping and grading, all trucks and other equipment shall be excluded from the finished areas to prevent excessive compaction. The Contractor shall perform such work as required to provide a friable surface for seed germination and plant growth prior to seeding.

During hauling and spreading operations, the Contractor shall immediately remove any material dumped or spilled on the shoulders or pavement.

It shall be the Contractor's responsibility to restore to the line, grade and surface all eroded areas with approved material and to keep the finished areas in acceptable condition until the completion of the construction work.

9.44.05—Basis of Payment: Payment for this work will made at the Contract unit price per square yard for "Furnishing and Placing Topsoil" which price shall include all materials, application of lime if necessary, equipment, tools, labor and work incidental thereto.

Pay Item	Pay Unit
Furnishing and Placing Topsoil	s.y.

SECTION 9.49
FURNISHING, PLANTING and MULCHING
TREES, SHRUBS, VINES and GROUND COVER PLANTS

9.49.01—Description**9.49.02—Materials****9.49.03—Construction Methods****9.49.04—Method of Measurement****9.49.05—Basis of Payment**

9.49.01—Description: The work under these items shall consist of furnishing trees, shrubs, vines and ground cover, preparation of planting areas, plant layout, planting, staking and guying, fertilizing, watering and mulching, as indicated on the plans or in the Contract. It shall also include all incidental procedures, such as the care of the living plants and the replacement of dead and unsatisfactory plants or unsatisfactory materials before final acceptance of the Contract.

9.49.02—Materials: The materials for these items shall meet the requirements of M.13.

9.49.03—Construction Methods: Construction methods shall be performed in accordance with the details shown on the landscape plans.

At the discretion of the Engineer, a pre-planting meeting may be held to discuss the source of supply, location of plantings, preparation of soil, time frame of delivery, temporary storage location, Contract specifics and any other incidental procedures relating to this item.

The Contractor is cautioned that within the limits of any project, buried cable for illumination or utilities, which may be energized may be present on Site. The requirements of 1.05.15 shall apply.

1. Planting Season: The planting seasons shall be those indicated below, as specified in the Contract or directed by the Engineer. Planting shall not be done if the ground is frozen, covered in snow, or if the soil is in an unsatisfactory condition as determined by the Engineer.

Deciduous Material

Spring: March 1st to May 31st (inclusive), except for balled and burlapped material. Balled and burlapped material may be planted any time from March 1st to June 15th (inclusive).

Fall: From October 15th until the ground freezes.

Evergreen Material

Spring: March 1st to May 31st (inclusive).

Fall: August 15th to October 31st (inclusive).

2. Delivery and Storage of Plants: The Contractor shall ensure that plants arrive to the Project location undamaged. The following care shall be taken during transport from the nursery through final planting location:

- a. Plants shall have mulch and water as necessary to keep moist and fresh at all times.
- b. Plants shall be protected against overexposure to sun, wind and freezing temperatures at all times.
- c. Bare-root plants, if not planted immediately upon receipt, shall be separated upon delivery and stored in an area where their roots are kept covered to keep air away until they are ready for planting.
- d. Balled and burlapped plants shall be stored with their earth balls covered by soil, wood chips, cloth, straw or other suitable material and kept moist until planting.
- e. Unless specified, all plants shall be stored in a shady location until planted.

3. Field Coordination: The Contractor shall submit a Source of Supply per M.13.07-4 to initiate the inspection and approval of all material. The Contractor shall review Site conditions and inform the Engineer of any conflicts. The Contractor shall coordinate planting layout with the Engineer for approval. The Contractor must notify the Engineer no less than 48 hours in advance, excluding weekends and holidays, of the completion of layout for approval. The planting layout must be approved by the Engineer prior to the commencement of work. The installation of plant material shall occur only after the completion of paving, the installation of footings or other operations which could damage the plants or alter the finished grades.

4. Planting Layout: Plant material locations and bed outlines shall be staked in the presence of the Engineer before any plant pits or beds are excavated. Labor, equipment and new, smooth stakes of approved quality are to be furnished by the Contractor for this purpose.

5. Preparation of Planting Areas: Planting areas shall be prepared by use of approved tools. All undesirable vegetation, roots or other obstructions shall be removed from the planting areas. Any unsuitable material shall be removed from the Site and disposed of by the Contractor in a manner

satisfactory to the Engineer.

If backfill is required, as determined by the Engineer, it shall meet the planting soil requirements of M.13.01-2.

In planting areas, but not less than 14 day before the installation of plant material, the remaining turf grasses and unwanted vegetation may be sprayed at the Contractor's expense, unless otherwise directed by the Engineer, with Glyphosate or approved equal at the manufacturer's recommended rate.

6. Pit Excavation: Planting pits may be excavated or hand dug at the discretion of the Engineer. Suitable excavated soil may be set aside to be incorporated into the planting mix. The planting pit shall be excavated so that the horizontal dimension of the hole is twice the diameter of the root ball, container, or bare root spread, as shown on the plans. The depth of the plant pit excavation shall be 2 inches less than the distance between the bottom of the root ball, container, or bare root mass, and the location of the root flare or top of the root structure. It may be required to remove the burlap and some soil from the top of the root ball to expose the root structure. Care must be taken so that soil will not loosen from the roots inside the ball.

Any rock or underground obstruction shall be removed to the depth necessary for planting as specified, unless other locations for the planting are approved by the Engineer. If removal of obstructions results in a deeper hole than needed for planting, or if the pit is overexcavated, backfill shall be added, and must be thoroughly compacted to the proper depth prior to setting plants. If backfill is required, it shall meet the planting soil requirements of M.13.01-2.

7. Setting Plants: The Contractor shall move the plants from storage to the planting location, retying any untied burlap to prevent shifting while placing the plant into the planting pit. Carefully place the plant into the center of the pit. Ensure that the root flare or the top of the root system is 2 inches above finished grade. Correct pit depth if the plant is less than 2 inches, or more than 4 inches above finished grade. All plants shall be set plumb. Backfill with planting soil to 1/2 the depth of the planting pit and thoroughly tamp around the ball. Fill the remaining area of the pit with water. Once water has completely drained, fill the remainder of the pit with planting soil. Water the planting area, re-tamp, and add additional planting soil to correct any low spots. Saucers shall be formed outside of individual plants (exclusive of plant beds) by placing ridges of planting soil around each, or as directed by the Engineer. In addition, the following shall be completed for each respective type of plant:

- a. **Balled and Burlapped Plants (B&B):** If wire baskets are used, the Contractor shall cut all of the horizontal wires in the top 2/3 of the rootball and bend down or remove the top 1/3 of the wire basket. Remove excess soil from the top of the root ball to expose the root structure, and cut away any small feeder or girdling roots. Roots that have been wrapped around the ball within the burlap shall be straightened.
- b. **Container Grown Plants (CG):** Carefully remove the plant from the container over the prepared pits. Gently loosen the soil and straighten all roots as naturally as possible. It may be required to cut and remove excessive amounts of root mass if roots are tightly wrapped or bound.
- c. **Bare-roots Plants (BR):** Carefully spread roots as naturally as possible and place into the bottom of the pit. All broken or frayed roots shall be cleanly cut off.

8. Fertilizing: All plants shall be fertilized at the rate of 3 lb. per 100 s.f. of surface area (broadcast). The fertilizer shall be uniformly applied to the surface of the beds and worked into the upper 2 inches of soil. Individual trees shall be fertilized at the rate of 2 lb. per inch of trunk diameter, and the fertilizer shall be mixed into the upper 2 inches of soil.

A second application of fertilizer shall be applied to all plant items at the same specified rates over the wood-chip mulch at the end of the period of establishment.

9. Watering: All plants shall be watered upon setting and as many times thereafter as conditions warrant. The following is a guide for minimum requirements per application:

- Trees: 2 1/2 inch Caliper and less – 15 gal. each.
- 3 inch to 5 inch Caliper – 20 gal. each.
- 5 1/2 inch Caliper and above – 25 gal. each.
- Shrubs: 24 inches and less – 6 gal. each.
- More than 24 inches - 10 gal. each.
- Vines, Perennials, and Ornamental Grasses – 3 gal. each.
- Groundcovers and Bulbs – 2 gal. per s.f.

Water shall be applied at a controlled rate and in such a manner to ensure that the water reaches the root zone of each plant and does not run off to adjacent areas. Watering shall be applied in a manner that does not dislodge plants, erode soil or mulch, or cause damage to saucer.

The Contractor may use slow-release, drip irrigation bags for watering at the Contractor's expense in accordance with manufacturer's instructions.

Overhead hydro-seeder spray nozzles shall not be used as watering devices.

10. Guying and Staking: Immediately after planting, trees shall be guyed or staked as shown on the plans. Guy wires, hose and tree support stakes shall be removed after the initial establishment period.

11. Pruning: As directed by the Engineer, plants shall be pruned before or immediately after planting. No leader shall be cut unless directed by the Engineer. Broken, or badly bruised branches, sucker growth, etc., shall be removed with clean cuts.

12. Spraying: Spraying with antidesiccant shall be at the Contractor's discretion and as approved by the Engineer, at the Contractor's expense.

13. Mulching: After installation of the plantings, the type of mulch specified in the Contract shall be hand placed and spread to a depth of 3 inches and raked to an even surface over all saucer areas for individual trees and shrubs and over the entire area of shrub beds and elsewhere as directed.

14. Repair: Repair of existing grass areas damaged by the Contractor in the progress of the work shall be the responsibility of the Contractor, who shall restore the disturbed areas to their original condition at the Contractor's expense.

15. One-Year Establishment Period: All plant material shall be subject to a One-Year Establishment Period. During this time, the Contractor shall use currently accepted horticultural practices to keep all plant material installed in a healthy, vigorous growing condition at the date of final acceptance. The date of final acceptance shall be 1 full calendar year following the satisfactory completion of the planting activities as confirmed by the Engineer.

An inspection will be held 1 year from the date of installation with the Contractor, Engineer, and Landscape Designer to determine the acceptability of the plant establishment. An inventory of losses and rejected materials will be made and corrective and necessary clean up measures will be determined at the plant inspection.

9.49.04—Method of Measurement:

1. Planting: The quantity for which payment will be made will be the number of each size and kind of plant counted in place, planted and accepted.

2. Mulching: This work will be measured for payment by the number of square yards surface measurement of the specified thickness for the area on which the type of mulch specified in the plans has been completed and accepted.

9.49.05—Basis of Payment:

1. Planting: Payment for this work will be made at the Contract unit price each for the kind and size of plant and method of planting, as the case may be, completed and accepted in place.

2. Mulching: This work will be paid for at the Contract unit price per square yard for mulch complete in place.

3. The unit prices shall include all materials, equipment, tools, labor, transportation, operations and all work incidental thereto, including the removal of guy wires, hose and tree support stakes after the initial establishment period, except that payment for excavation of solid ledge rock, concrete pavement and boulders 1/2 cubic yard in volume or greater will be made under 9.51, "Rock Excavation for Planting."

Pay Item	Pay Unit
(Plant Name) (Caliper)	ea.
(Plant Name) (Height)	ea.
(Plant Name) (Size)	ea.
(Vine Name) (Size)	ea.
(Ground Cover Name) (Size)	ea.
Wood Chip Mulch	s.y.
Gravel Mulch	s.y.

**SECTION 9.74
REMOVAL OF EXISTING MASONRY**

Replace Section 9.74 in its entirety with the following:

**SECTION 9.74
REMOVAL OF EXISTING MASONRY**

9.74.01—Description: This work shall include the full or partial removal and disposal of substructures, walls, approach slabs and other masonry components, as indicated on the plans. These structures may be constructed of dry masonry, cement rubble masonry, concrete or reinforced concrete.

9.74.03—Construction Methods:

1. Submittals:

The Contractor shall prepare and submit written procedures for removal. Working drawings, in accordance with 1.05.02, shall also be prepared and submitted as warranted by the complexity and safety considerations of the work. The submittals shall address the following:

- proposed equipment and removal method(s)
- operating and storage location(s) of equipment
- containment and disposal of debris
- installation and removal of:
 - a. debris shields
 - b. working platforms
 - c. falsework
- temporary support(s) for maintenance of traffic
- modification to and restoration of the structure to remain in place

2. Removal: Structures and bridge components shall be removed to the limits shown on the plans or as directed by the Engineer.

General removal may be performed by excavator-mounted demolition equipment or other methods except where prohibited on the plans or as directed by the Engineer.

If partial removal of concrete is required, it shall be sawcut to the neat lines as indicated on the plans. Near reinforcing steel that is to remain, the Contractor must use limited methods for removal, such as fifteen (15) pound hammers or other methods accepted by the Engineer.

Reinforcing steel shall be cut and removed where shown on the plans. Reinforcing steel to remain shall be cleaned of all concrete and corrosion products by oil-free abrasive blasting, high-pressure water blasting or other methods accepted by the Engineer. The reinforcing steel and concrete surfaces shall be free from dirt, oil, cement fines (slurry), or any material that may interfere with the bond of the proposed concrete. Tightly-bonded light rust on the reinforcing surface is acceptable.

Where stage construction requires concrete to be removed adjacent to the existing structure that will continue to support live load, the Contractor shall cut the concrete in accordance with the accepted working drawings at the demolition limit shown on the plans to minimize disturbance to the section that is to remain in place.

3. Disposal of Debris: The Contractor shall properly dispose of all construction debris either off-Site, or on-Site in accordance with 2.02.03-5.

4. Damage Mitigation: When removing the structures or a portion thereof, the Contractor shall take necessary precautions to prevent debris from dropping to areas below the structure, onto adjacent traffic lanes or onto adjacent property. Any damage to adjoining areas, including but not limited to new construction, public utility installations, abutting property and to the portions of the structure that will remain shall be repaired by the Contractor in accordance with 1.05.11.

9.74.04—Method of Measurement: This work will be measured for payment by the volume in cubic yards in place prior to removal, to the limits shown on the plans or as directed by the Engineer.

9.74.05—Basis of Payment:

Payment for “Removal of Existing Masonry” will be made at the Contract unit price per cubic yard, which price shall include all equipment, tools and labor incidental to the removal and shall include the proper disposal thereof.

The cost of furnishing, installing and removing protective debris shielding, falsework and working platforms is included in the cost of this item.

Payment for the full or partial removal of bridge superstructure(s) will be made at the Contract lump sum price for “Removal of Superstructure,” in accordance with 5.03.05.

Pay Item	Pay Unit
Removal of Existing Masonry	c.y.

**SECTION 11.30
HIGH MOUNTED INTERNALLY ILLUMINATED
FLASHING ARROW**

Replace Section 11.30 in its entirety as follows:

**SECTION 11.30
HIGH MOUNTED INTERNALLY ILLUMINATED
FLASHING ARROW**

11.30.01—Description: Work under this item shall include furnishing and maintaining a high-mounted internally-illuminated flashing arrow, trailer-mounted or truck-mounted, at the locations indicated on the plans or as directed by the Engineer.

11.30.02—Materials: A Materials Certificate for the flashing arrow shall be submitted to the Engineer. The flashing arrow shall be Type C, meet the requirements of MUTCD Chapter 6F, and the following:

1. Physical Characteristics of the Flashing Arrow

- a. Flashing Arrow Display Dimensions - Width 8 feet, height 4 feet
- b. Height off Roadway - Minimum 7 feet from the roadway to the bottom of the display, except on truck-mounted flashing arrows, which shall be as high as practical
- c. Power Source - Battery or solar power, including backup
- d. Secure Controller - Flashing arrow shall be equipped with a lockable cabinet for controller storage

2. Visual Characteristics of the Flashing Arrow Display

- a. Matrix - Minimum of 15 illuminated elements
- b. Display Modes - Left arrow, right arrow, double arrow, caution (bar or corners)
- c. Color - Non-reflective black background with yellow or amber elements
- d. Flash Rate - 25 to 40 flashes per minute
- e. Dimming - Flashing arrow shall be equipped with a photocell for automatic sign dimming, with at least 50% from full brilliance, based on lighting conditions
- f. Legibility - Flashing arrow brightness must provide for legibility within 1 mile

11.30.03—Construction Methods: The Contractor shall furnish, place, operate, and relocate the flashing arrow as required on the plans or as directed by the Engineer, in accordance with Chapter 6F of the MUTCD.

The Contractor shall maintain the flashing arrow in accordance with the ATSSA "Quality Standards for Temporary Traffic Control Devices and Features." Any flashing arrow that does not meet these guidelines shall be removed and replaced.

When the flashing arrow is no longer required, it shall be removed from the Site.

11.30.04—Method of Measurement: This work will be measured for payment by the number of calendar days that the flashing arrow is in place and in operation. When a flashing arrow is in operation for less than a day, such a period of time shall be considered to be a full day regardless of actual time in operation.

11.30.05—Basis of Payment: This work will be paid for at the Contract unit price per day for "High Mounted Internally Illuminated Flashing Arrow," which price shall include furnishing, maintaining, relocating, removing the flashing arrow and its appurtenances, and all material, labor, tools and equipment incidental thereto.

Pay Item	Pay Unit
High Mounted Internally Illuminated Flashing Arrow	day

**SECTION 11.31
REMOTE CONTROLLED CHANGEABLE
MESSAGE SIGN**

Replace Section 11.31 in its entirety with the following:

**SECTION 11.31
REMOTE CONTROL CHANGEABLE
MESSAGE SIGN**

11.31.01—Description: Work under this item shall include furnishing and maintaining a trailer-mounted, changeable message sign (CMS) at the locations indicated on the plans or as directed by the Engineer.

11.31.02—Materials: A Materials Certificate for the CMS shall be submitted to the Engineer. The CMS shall meet the requirements of MUTCD Chapters 2L and 6F and the following:

- 1. Physical Characteristics of the CMS**
 - a. Sign Display Dimensions - Minimum width 10 feet, minimum height 5.5 feet
 - b. Height off Roadway - Minimum 7 feet from the roadway to the bottom of the display
 - c. Sign Rotation - Mounting post shall be capable of 180 degree rotation
 - d. Power Source - Battery or solar power, including backup
 - e. Protection - CMS shall have a secure, lockable controller cabinet and remote, and panel controller password protection
- 2. Visual Characteristics of the CMS Display**
 - a. Sign Type - CMS shall have LED display
 - b. Display - CMS shall be character, line or full matrix
 - c. Color - CMS shall have black background with orange, yellow or amber legend
 - d. Line - CMS shall be capable of displaying 3 lines and 8 upper-case characters per line
 - e. Characters - Letter height shall be 18 inches and letter width shall be 12 inches; Single stroke
 - f. Font - 5 × 7 pixels per character
 - g. Dimming - CMS shall be equipped with a photocell for automatic sign dimming based on lighting conditions
 - h. Memory - CMS shall be capable of storing a minimum of 50 messages
 - i. Communication - CMS shall be capable of remote offsite programming
 - j. Visibility and Legibility - CMS brightness must provide for visibility at 1/2 mile and be legible within 900 feet

11.31.03—Construction Methods: The Contractor shall furnish, place, operate, maintain and relocate the sign as required on the plans or as directed by the Engineer, in accordance with Chapter 6F of the MUTCD.

The message content and timing shall be in accordance with the CTDOT Portable Variable Message Signs [Operations Guide](#). The Engineer must approve the message and location prior to sign operation.

When the sign is not displaying a message, it shall be relocated beyond the clear zone or shielded behind a traffic barrier and turned away from traffic.

The Contractor shall maintain the changeable message sign in accordance with the ATSSA “Quality Guidelines for Temporary Traffic Control Devices and Features.” Any sign that does not meet these guidelines shall be removed and replaced.

When the sign is no longer required, it shall be removed from the Site.

11.31.04—Method of Measurement: This work will be measured for payment by the number of calendar days that the changeable message sign is in place and in operation. When a sign is in operation for less than a day, such a period of time shall be considered to be a full day regardless of actual time in operation.

11.31.05—Basis of Payment: This work will be paid for at the Contract unit price per day for "Remote Control Changeable Message Sign," which price shall include furnishing, maintaining, relocating, removing the sign and appurtenances, the remote controller, and all material, labor, tools and equipment incidental thereto.

Pay Item	Pay Unit
Remote Control Changeable Message Sign	day

**SECTION 12.04
SIGN PANEL OVERLAY**

Replace Section 12.04 in its entirety as follows:

**SECTION 12.04
SIGN-PANEL OVERLAY**

12.04.01—Description: Work under this item shall consist of furnishing and installing a plywood overlay of the type specified to cover an existing sign where shown on the plans or where directed by the Engineer.

12.04.02—Materials: Plywood shall have a minimum thickness of 1/4 inch and shall be exterior grade A-C as designated by APA.

The wood preservative shall be of a type that will have no adverse effect on paint adhesion and will not cause future paint discoloration.

Primer shall meet the requirements of A-A-2336.

The enamel paint to be used for the finish coat shall be as specified in Article M.18.08.

Copy shall meet the requirements contained in M.18.09 or M.18.10 of the Contract.

12.04.03—Construction Methods: The plywood overlay shall completely cover the existing sign, including the exit crown panel. The plywood sheets shall be joined together to form a single overlay by means of 1 inch x 4 inches construction grade fir wood battens securely fastened to adjoining panels with 1 inch galvanized wood screws. The battens shall be fastened to the Grade C back face of the overlay.

Before assembly and before painting, all wood shall be treated with a coat of wood preservative on all surfaces.

The entire overlay surface shall be painted with 1 coat of primer and 1 coat of enamel.

The plywood shall remain in place for the duration of the Project.

All work fabricating and clamping the plywood sign-panel overlay shall be done to ensure that no damage occurs to the existing sign.

12.04.04—Method of Measurement: Sign-panel overlay of the type specified will be measured for payment by the actual number of square feet installed and accepted.

12.04.05—Basis of Payment: This work will be paid for at the Contract unit price per square foot for "Sign Panel Overlay," of the type specified complete in place, which price shall include all materials, equipment, tools and labor incidental thereto.

Pay Item	Pay Unit
Sign Panel Overlay—Plain	s.f.
Sign Panel Overlay—with Copy	s.f.

**SECTION 12.07
SIGN FACE - EXTRUDED ALUMINUM**

Replace Section 12.07 in its entirety with the following:

**SECTION 12.07
SIGN FACE - EXTRUDED ALUMINUM**

12.07.01—Description: Work under this item shall consist of furnishing and installing sign face extruded aluminum with the Type IV retroreflective sheet facing at locations indicated on the plans or as directed by the Engineer.

12.07.02—Materials: Materials for this work shall meet the requirements of M.18.09, M.18.10, M.18.11 and M.18.12. Structural steel shall meet the requirements of ASTM A36. All members shall be galvanized after fabrication in accordance with the requirements of ASTM A123. Zinc paint shall meet the requirements of ASTM A780. Data Labels shall meet the requirements of M.18.16.

12.07.03—Construction Methods: Erection of completed sign panels shall be accomplished in a manner so as not to cause twisting, bending or deforming of sign panels or scratching of the sign face. Any sign panel damaged shall be repaired or replaced at the Contractor's expense. Sign panels shall be level, correctly aligned as indicated on the plans, and shall be properly fastened to the structure or supports with the necessary hardware as indicated on the plans.

Retroreflective sheeting shall be applied in such a manner that the finished sign will be wrinkle and bubble free. No splices of the retroreflective sheeting will be permitted on any sign face less than 30 square feet in area with 1 dimension of 4 feet or less and no more than 1 splice will be permitted on any sign without the approval of the Engineer.

Extruded aluminum signs shall be attached to existing supports with new post clip assemblies consisting of post clips, bolt, nut and washer as shown on the plans. All other hardware used for attachment of the overhead signs to the supports may remain in use and be relocated on the structure as required. Check and tighten all bolts and nuts for attachment hardware which is to remain in use.

New extruded aluminum signs shall be vertically centered on existing supports. Overhead sign support brackets (Z bar, I bar, channel shape or angle iron) that project beyond the top or bottom of a new sign shall be cut to fit even with the edge of the new sign, preferably at the bottom. If necessary, cuts may be made at both ends.

Where overhead signs having a vertical dimension exceeding the length of the existing sign support brackets, the existing brackets shall be removed and replaced with new vertical brackets having the length equal to the sign height.

All galvanized areas damaged by field cuts or welds shall receive zinc paint that is brush applied to achieve a dry film thickness from 3 to 6 mils.

All overhead sign erections shall be made immediately upon removal of the sign being replaced.

All overhead sign foundations shall be field staked. The locations of the stakes shall be accepted by an Engineer from the Division of Traffic Engineering, a minimum of 7 days prior to installation.

For all side mounted signs, the edge of the sign closest to the roadway and the sign foundation shall be field staked and accepted by an Engineer from the Division of Traffic Engineering, a minimum of 7 days prior to installation.

For side-mounted signs, the offset to the near edge of the sign face shall exceed the maximum deflection of the guide rail, unless otherwise shown on the plans or directed by the Engineer.

The Contractor shall affix data labels to the back of each State-owned and maintained sign in the vicinity of the lower left hand corner or quadrant. The Contractor shall punch the month and year of sign fabrication and installation on each data label prior to affixing to the back of the sign.

12.07.04—Method of Measurement: This work will be measured for payment by the number of square feet of sign face-extruded aluminum of the type specified installed and accepted.

12.07.05—Basis of Payment: This work will be paid for at the Contract unit price per square foot for "Sign Face-Extruded Aluminum" of the type specified complete in place, which price shall include all data labels, materials, equipment, labor and work incidental thereto. Also included shall be any additional vertical sign support brackets required to attach new signs to existing supports.

Pay Item	Pay Unit
Sign Face - Extruded Aluminum (Type)	s.f.

**SECTION 12.08
SIGN FACE - SHEET ALUMINUM**

Replace Section 12.08 in its entirety with the following:

**SECTION 12.08
SIGN FACE - SHEET ALUMINUM**

12.08.01—Description: Work under this item shall consist of furnishing and installing sign face-sheet aluminum signs of the type specified, metal sign posts, span-mounted sign brackets and mast arm-mounted sign brackets at locations indicated on the plans or as directed by the Engineer.

12.08.02—Materials: Retroreflective sheeting shall meet the requirements of Article M.18.09, Type IV or IX. Sheet aluminum sign blanks shall meet the requirements of M.18.13. Silk screening of Type IV or IX retroreflective sheeting shall meet the requirements specified by the retroreflective sheeting manufacturer. Metal sign posts shall meet the requirements of M.18.14. Sign mounting bolts shall meet the requirements of M.18.15. Data Labels shall meet the requirements of M.18.16.

12.08.03—Construction Methods: Placement and dimensions of copy, border and mounting holes shall be as shown in details of the Department of Transportation for Regulatory Warning and Guide signs which are available for inspection at the Department of Transportation office. Non-reflective copy, border and background shall be applied by the silk-screen process in a manner specified by the retroreflective sheeting manufacturer. The silk screening of all copy, border and background on Type IV or IX retroreflective sheeting shall be accomplished prior to the application of the retroreflective sheeting to the finished aluminum sign blank. Type IV or IX retroreflective sheeting shall be of the heat activated adhesive type and shall be applied in a manner specified by the retroreflective sheeting manufacturer.

Retroreflective sheeting shall be applied in such a manner that the finished sign will be wrinkle and bubble free. No splices of the retroreflective sheeting will be permitted on any sign face less than 30 square feet in area with 1 dimension of 4 feet or less and no more than 1 splice will be permitted on any sign without the approval of the Engineer.

Direct application of cutout Type IV or IX retroreflective sheeting copy and border shall meet the requirements specified by the retroreflective sheeting manufacturer. Cutout copy and border shall be applied directly to clean, dust free retroreflective sheeting background panels. Borders shall be cut neatly and butt-joined at corners and panel joints. Type IV or IX retroreflective sheeting used for direct applied cutout copy and border shall be uniform in brightness and color.

The fabrication of aluminum sign blanks including cutting to size and shape and the punching of mounting holes shall be completed prior to metal degreasing and the application of reflective sheeting. Aluminum sign blanks shall be free of buckles, warp, dents, cockles, burrs and defects resulting from fabrication. Span-mounted sign brackets and mast arm-mounted sign brackets shall be installed as shown on the plans.

After complete fabrication of the sign as indicated on the plans and in compliance with the requirements contained in the Specifications, the sign shall be mounted on the type of support designated on the plans after the support has been satisfactorily installed at its proper location. The reinforcing plate shall be installed as shown on the plans.

Metal sign posts shall be driven or the holes augered and the backfill thoroughly tamped after the posts have been set level and plumb.

The Contractor shall affix data labels to the back of each State-owned and maintained sign in the vicinity of the lower left hand corner or quadrant. The Contractor shall punch the month and year of sign fabrication and installation on each data label prior to affixing to the back of the sign.

12.08.04—Method of Measurement: This work will be measured for payment by the number of square feet of sign face-sheet aluminum of the type specified, installed and accepted.

12.08.05—Basis of Payment: This work will be paid for at the Contract unit price per square foot for "Sign Face-Sheet Aluminum" of the type specified complete in place, which price shall include the completed sign, metal sign post(s), span-mounted sign brackets and mast arm-mounted brackets, mounting hardware, including reinforcing plates, data labels, and all materials, equipment, labor and work incidental thereto.

Pay Item	Pay Unit
Sign Face - Sheet Aluminum (Type)	s.f.

SECTION 12.10
EPOXY RESIN PAVEMENT MARKINGS

Replace Articles 12.10.01 and 12.10.03 with the following:

12.10.01—Description: This item shall consist of furnishing and installing retroreflective white and yellow epoxy resin pavement markings of the width and color specified and epoxy resin pavement markings, symbols and legends at the locations indicated on the plans, in conformity with the plans and as directed by the Engineer.

Epoxy resin pavement markings include epoxy resin installed with a truck-mounted machine, such as center lines, lane lines, and shoulder lines.

Epoxy resin pavement markings, symbols and legends installed with a hand striping machine such as: stop bars, crosswalks, parking stalls, lane arrows, legends, and markings within areas such as paved islands, gore areas and paved medians.

The exact location for passing zones will be determined by the Engineer prior to the application of the pavement markings. The Contractor shall notify the Engineer of the anticipated date of installation at least 2 weeks prior to that date, to allow time for the determination of the passing zone locations.

12.10.03—Construction Methods:

1. Equipment: Equipment furnished shall include an applicator truck of adequate size and power, together with

- (a) remote application equipment designed to apply an epoxy resin material in a continuous pattern and
- (b) portable glass bead applicators, 1 for each size bead, designed to provide uniform and complete coverage of the epoxy binder by a controlled free-fall method. Pressurized glass bead application shall not be used.

Before epoxy color is changed, equipment shall be cleaned out sufficiently to ensure that the color of material applied will be correct.

When working on a highway with more than 1 lane in either direction, the applicator truck (striper) shall have a permanently mounted direction variable illuminated arrow board, fully operational and visible to approaching traffic. There will be no additional payment for the arrow board, but the cost shall be included in the bid price for this item.

For markings applied on pavements over 1 year old, equipment furnished shall also include a power washing machine capable of cleaning the pavement with a pressure of 2,400 to 2,800 psi with water heated to between 180 and 195°F. No chemicals shall be added to the water used in the process. The power washer shall be equipped with a turbo blast tip with an oscillating head and shall be capable of supplying a minimum of 5 gal./minute gun.

All guns on the spray carriages shall be in full view of the operator(s) during operation.

Each vehicle furnished shall include at least 1 experienced operator, who shall be fully knowledgeable about all equipment operations and application techniques.

The Contractor shall also furnish 1 technical expert, who shall be fully knowledgeable about all equipment operations and application techniques, to oversee the Project operation.

2. Procedures: Pavement markings shall be applied in accordance with the details shown on the plans and the control points established by the Contractor and approved by the Engineer.

The road surface shall be cleaned at the direction of the Engineer just prior to application. Pavement cleaning shall consist of power washing using clean water heated to between 180 and 195°F at a pressure of 2,240 to 2,800 psi. The areas to be power washed shall include all areas where epoxy marking symbols and legends (including stop bars and crosswalks) are to be applied and at least 1 inch beyond the area to be marked. The surface shall be cleaned to the satisfaction of the Engineer. For other pavement areas, cleaning shall consist of brushing with rotary broom (non-metallic), and any additional work as recommended by the material manufacturer and acceptable to the Engineer. New Portland cement concrete surfaces shall be cleaned by abrasive blasting to remove any surface treatments or laitance. New bituminous concrete surfaces are not to be power washed.

All surfaces that are power washed shall be allowed to dry sufficiently prior to the application of the epoxy markings. The areas to be marked shall be broom cleaned immediately prior to the application of the epoxy markings. Glass beads shall be applied immediately after application of the epoxy resin marking to provide an immediate no-track system.

The Contractor will place necessary “spotting” at appropriate points to provide horizontal control for

striping and to determine necessary starting and cutoff points. Broken line intervals will not be marked. Longitudinal joints, pavement edges and existing markings shall serve as horizontal control when so directed.

A tolerance of 0.25 inch under or 0.25 inch over the specified width shall be allowed for striping provided the variation is gradual and does not detract from the general appearance. Alignment deviations from the control guide shall not exceed 2 inches provided the variation is gradual and does not detract from the general appearance. Material shall not be applied over a longitudinal joint. Establishment of application tolerances shall not relieve the Contractor of the responsibility to comply as closely as practicable with the planned dimensions.

Operations shall be conducted only when the road surface temperature is at least 40°F or as allowed by the Engineer. They shall be discontinued during periods of rain, and shall not continue until the Engineer determines that the pavement surface is dry enough to achieve adhesion.

The epoxy shall be uniformly applied to the surface to be marked to ensure a wet film thickness of the applied epoxy, without glass beads, of 20 mils +/- 1 mil.

Glass beads meeting the requirements of Type 4 (larger beads) shall be applied and the rate shall be 12 lb./gal. of epoxy pavement marking material, immediately followed by a second drop of glass beads meeting the requirements of Type 1 (smaller beads) applied and the rate shall be 13 lb./gal. of epoxy pavement marking material. For installation of crosswalk pavement markings, only glass beads meeting the requirements of Type 1 (smaller beads) shall be applied and the rate shall be 25 lb./gal. of epoxy pavement marking material. Traffic cones or other acceptable method shall be used to protect the pavement markings until cured.

Time to No-Track: The material shall be in “no-tracking” condition within 15 minutes, or as allowed by the Engineer. The no-tracking time shall be determined by passing over the line with a passenger car or pickup truck in the simulated passing maneuver. A marking showing no visual deposition of the material to the pavement surface when viewed from a distance of 50 feet shall be considered as showing “no-tracking” and meeting this requirement for time to no-track.

When stencils are used during the application of epoxy markings, care must be used when removing the stencils so that the epoxy resin does not drip on the road, sidewalk, grass, or other surfaces, and so that the applied markings have edges which are clean, straight and neat.

Epoxy resin pavement markings may be applied over existing painted markings provided they are sufficiently worn to allow adequate adhesion. If required by the Engineer, existing plastic, thermoplastic, epoxy or freshly painted markings shall be removed prior to the application of epoxy markings. Payment for removal will be made under the item “Removal of Pavement Markings.”

3. Initial Performance: The retroreflectivity of the markings applied must be measured by the Contractor using the procedures and equipment detailed below 3 to 14 days after installation. A Certified Test Report (CTR), in accordance with 1.06.07, must be submitted to the Engineer no later than 10 days after the measurements are taken.

Test Lots - The following test lots will be randomly selected by the Engineer to represent the line markings applied:

Table 12.10.03-3.1: Line Test Lots

Length of line	Number of Lots	Length of Test Lot
< 1000 feet	1	Length of Line
< 1.0 mile	1	1000 feet
≥ 1.0 mile	1 per 1.0 mile	1000 feet

Measurement Equipment and Procedure

Portable Retroreflectometer

1. Skip line measurements shall be obtained for every other stripe, taking no more than 2 readings per stripe with readings no closer than 20 inches from either end of the marking.
2. Solid line test lots shall be divided into 10 sub-lots of 100 foot length and measurements obtained at 1 randomly selected location in each subplot.
3. For symbols and legends, 10% of each type shall be measured by obtaining 5 measurements at random locations on the symbol or legend.
4. The Apparatus and Measurements shall be made in accordance with ASTM E1710 (Standard Test Method for Measurement of Retroreflective Pavement Marking Materials with CEN-Prescribed Geometry Using a Portable Retroreflectometer) and evaluated in accordance with ASTM D7585

(Standard Practice for Evaluating Retroreflective Pavement Markings Using Portable Hand-Operated Instruments).

Mobile Retroreflectometer

1. Calibration of the instruments shall be in accordance with the manufacturer's instructions.
2. Retroreflectivity shall be measured in a manner proposed by the Contractor and approved by the Engineer. The basis of approval of the test method will be conformance to a recognized standard test method or provisional standard test method.

The measurements shall be obtained when the pavement surface is clean and dry and shall be reported in millicandelas per square foot per foot candle - $\text{mcd}/\text{ft}^2/\text{fc}$. Measurements shall be obtained sequentially in the direction of traffic flow.

Additional Contents of Certified Test Report

The CTR shall also list:

1. Project and Route number
2. Geographical location of the test site(s), including distance from the nearest reference point
3. Manufacturer and model of retroreflectometer used
4. Most recent calibration date for equipment used
5. Grand Average and standard deviation of the retroreflectivity readings for each line, symbol or legend

Minimum Initial Performance:

In order to be accepted, all epoxy resin pavement markings must meet the following minimum retroreflectivity reading requirement:

White Epoxy (except Crosswalks): minimum retroreflectivity reading of $400 \text{ mcd}/\text{ft}^2/\text{fc}$

Yellow Epoxy: minimum retroreflectivity reading of $325 \text{ mcd}/\text{ft}^2/\text{fc}$

Crosswalks: minimum retroreflectivity reading of $250 \text{ mcd}/\text{ft}^2/\text{fc}$

At the discretion of the Engineer, the Contractor shall replace, at its expense, such amount of lines, symbols and legends that the grand average reading falls below the minimum value for retroreflectivity. The Engineer will determine the areas and lines to be replaced. The cost of replacement shall include all materials, equipment, labor and work incidental thereto.

**SECTION 12.14
PREFORMED BLACK LINE MASK PAVEMENT MARKING TAPE**

Replace Article 12.14.05 with the following:

12.14.05—Basis of Payment: This work shall be paid for at the Contract unit price per linear foot for “Preformed Black Line Mask Pavement Marking Tape” of the width specified. This price shall be for all the work required by this Section including the cleaning and preparing of the pavement surface, installation and removal, and all materials, equipment, tools and labor incidental thereto.

Any masking tape which is no longer effective, in the opinion of the Engineer, shall be replaced by the Contractor, at its own expense.

Removed masking tape shall become the property of the Contractor and shall be removed from the Project. Any damage to the underlying markings caused by the Contractor’s operations shall be repaired by the Contractor, at its own expense.

Pay Item	Pay Unit
(Width) Preformed Black Line Mask Pavement Marking Tape	l.f.

SECTION 12.16
BLACK EPOXY RESIN PAVEMENT MARKINGS
BLACK EPOXY RESIN SYMBOLS AND LEGENDS

Delete Section 12.16 in its entirety.

**SECTION 18.00
GENERAL CLAUSES –
IMPACT ATTENUATION SYSTEMS**

Delete Section 18.00 in its entirety.

**SECTION 18.02
TYPE A - IMPACT ATTENUATION SYSTEM**

Rename and replace Section 18.02 in its entirety as follows:

**SECTION 18.02
SAND BARRELS**

18.02.01—Description: Work under this item shall consist of furnishing, installing and maintaining permanent sand barrels at the locations shown on the plans. This item shall also include furnishing, installing, maintaining, relocating and removing temporary sand barrels at the locations shown on the plans.

18.02.02—Materials: The sand barrels shall be listed on the Department’s Qualified Products List. The sand shall meet the requirements of M.05.02-2, with a maximum moisture content of 3% and be thoroughly mixed with 20% sodium chloride by weight. Sodium chloride shall meet the requirements of AASHTO M 143, Type 1, and Grade 1.

The reflector shall meet the requirements of M.18.09.

18.02.03—Construction Methods: The sand barrels shall be placed at the location on the plans or as directed by the Engineer.

The sand barrels shall be maintained during all stages of construction. Any damaged sand barrels shall be replaced within 24 hours of notification from the Engineer. The Contractor shall be responsible for the removal and proper disposal of all damaged material and debris.

Sand barrels shall be relocated to locations shown on the plans or as directed by the Engineer.

All temporary sand barrels no longer required for the Project shall be removed immediately.

18.02.04—Method of Measurement: Permanent sand barrels will be measured for payment by the number of each sand barrel, of specified weight, installed and accepted by the Engineer.

Temporary sand barrels will be measured for payment by the number of each sand barrel of specified weight installed and removed, and accepted by the Engineer.

Relocation of temporary sand barrels will be measured for payment by the number of each sand barrel of specified weight relocated and accepted by the Engineer. There will be no measurement for relocating sand barrels to a storage location.

Adjustment or realignment of sand barrels will not be measured for payment.

18.02.05—Basis of Payment: Sand barrels designated for permanent installation on the Project will be paid for at the Contract unit price for each "Permanent Sand Barrel (Weight)" furnished, installed and maintained, which price shall include the reflector, all materials, equipment, tools and labor incidental thereto.

Sand barrels designated for temporary installation on the Project, will be paid for at the Contract unit price for each "Temporary Sand Barrel (Weight)" furnished, installed, maintained and removed, which price shall include the reflector, all materials, equipment, tools and labor incidental thereto.

Relocation of temporary sand barrels will be paid for at the Contract unit price for each "Relocation of Temporary Sand Barrel (Weight)." This price shall include transportation, equipment, tools and labor incidental to relocating the sand barrels.

Replacement of damaged barrels will be paid for at the Contract unit price for each barrel, for the type and weight specified.

Pay Item	Pay Unit
Permanent Sand Barrel (Weight)	ea.
Temporary Sand Barrel (Weight)	ea.
Relocation of Temporary Sand Barrel (Weight)	ea.

After Section 18.02, add the following section:

**SECTION 18.03
IMPACT ATTENUATION SYSTEM
TEMPORARY IMPACT ATTENUATION SYSTEM**

18.03.01—Description: Work under this item shall consist of furnishing, installing and maintaining an impact attenuation system of the type specified at the location shown on the plans. Work under this item shall also include repair of the impact attenuation system.

18.03.02—Materials: The impact attenuation system shall be listed on the Department’s Qualified Products List for the compatible barrier type.

The reflector shall meet the requirements of M.18.09.

18.03.03—Construction Methods: The impact attenuation system shall be installed or repaired according to the manufacturer’s recommendations at the location shown on the plans.

Any damaged impact attenuation system shall be repaired within 24 hours of notification from the Engineer. The Contractor shall be responsible for the removal and the proper disposal of all damaged material and debris.

18.03.04—Method of Measurement: The impact attenuation system will be measured for payment by the number of each system installed and accepted by the Engineer.

The sum of money shown on the estimate and in the itemized proposal as “Estimated Cost” for repair of impact attenuation system will be considered the price bid even though payment will be made only for actual work performed. The estimated cost figure is not to be altered in any manner by the bidder. Should the bidder alter the amount shown, the altered figures will be disregarded and the original price will be used to determine the total amount bid for the Contract.

18.03.05—Basis of Payment: Impact attenuation system will be paid at the Contract unit price for each “Impact Attenuation System (Type)” furnished and installed, which price shall include the reflector and all materials, transportation, equipment, tools and labor incidental thereto.

Temporary impact attenuation system will be paid at the Contract unit price for each “Temporary Impact Attenuation System (Type)” furnished, installed and removed, which price shall include the reflector and all materials, transportation, equipment, tools and labor incidental thereto.

“Repair of Impact Attenuation System” will be paid for in accordance with 1.09.04 as required to restore the system to its full working condition in accordance with the manufacturer’s recommendations. Maintenance and protection of traffic will only be paid for when, in the opinion of the Engineer, it is solely required for repair of the system.

Pay Item	Pay Unit
Impact Attenuation System (Type)	ea.
Temporary Impact Attenuation System (Type)	ea.
Repair of Impact Attenuation System (Type)	est.

**SECTION 18.06
TYPE D PORTABLE IMPACT ATTENUATION
SYSTEM**

Rename and replace Section 18.06 in its entirety as follows:

**SECTION 18.06
TRUCK-MOUNTED OR TRAILER-MOUNTED
IMPACT ATTENUATOR**

18.06.01—Description: This item shall consist of furnishing, operating, maintaining, and relocating a Truck-Mounted or Trailer-Mounted Impact Attenuator (TMA).

18.06.02—Materials: Prior to using a TMA, the Contractor shall submit to the Engineer a Materials Certificate in accordance with 1.06.07 for each attenuator supplied and a copy of the Federal-aid eligibility letter issued to the manufacturer documenting that the device complies with the requirements of the NCHRP Report 350 (TL-3) or the AASHTO MASH (TL-3).

The impact attenuator shall be attached to a truck in accordance with the manufacturer’s recommendations.

The impact attenuator shall be equipped with a minimum of 2 yellow flashing lights. An attenuator reflector consisting of Type IV retroreflective sheeting that displays an inverted “V” pattern, with alternating black and retroreflective yellow stripes, shall be placed on the back of the unit. The attenuator reflector shall fully cover the rear face of the impact attenuator.

The truck shall be equipped with a high mounted internally illuminated flashing arrow which meets the requirements of 11.30.

The truck shall be equipped with a minimum of 2 amber strobe type flashers mounted above the internally illuminated flashing arrow.

18.06.03—Construction Methods: The Contractor shall furnish, operate and relocate each TMA according to the Traffic Control Pattern described in the special provisions for Maintenance and Protection of Traffic and Prosecution and Progress.

The Contractor shall maintain each TMA in a fully operable condition at all times. Any TMA that is not fully functional will not be permitted at the Project Site.

18.06.04—Method of Measurement: This item will be measured for payment by the actual number of hours that the Truck-Mounted or Trailer-Mounted Impact Attenuator is used.

Subject to the approval of the Engineer, the TMA may be used as a High Mounted Internally Illuminated Flashing Arrow. If the TMA is used as a Flashing Arrow, then it will be measured for payment per day under the item “High Mounted Internally Illuminated Flashing Arrow.”

18.06.05—Basis of Payment: The TMA will be paid for at the Contract unit price per hour for “Truck-Mounted or Trailer-Mounted Impact Attenuator,” which shall include the furnishing and use of the specified vehicle and a driver, attenuator reflector, flashing lights, illuminated flashing arrow sign, and all equipment, materials, tools, labor, disposal of damaged TMA components and work incidental thereto.

Pay Item	Pay Unit
Truck-Mounted or Trailer-Mounted Impact Attenuator	hr.

SECTION 18.07
TEMPORARY IMPACT ATTENUATION SYSTEMS

Delete Section 18.07 in its entirety.

**SECTION M.01
GRADATION OF AGGREGATE**

Rename and replace Section M.01 in its entirety with the following:

**SECTION M.01
AGGREGATES**

M.01.01—General**M.01.02—Coarse Aggregates****M.01.03—Fine Aggregates****M.01.04—Portland Cement Concrete (PCC) Aggregates****M.01.05—Bituminous Concrete Aggregates****M.01.01—General:**

Each source of aggregate must be qualified for use by the Engineer as indicated in 1.06.01.

Material from a qualified source is still subject to Project-level testing and may be subject to rejection as indicated in 1.06.04.

Aggregates must not have expansive or reactive properties. Aggregates reclaimed from pavements or structures may only be used where specifically allowed in the specifications.

Aggregate stockpiles must be located on smooth, hard, sloped/well-drained areas. Each source and gradation of aggregate must have an individual stockpile or bin. Stockpiles must be managed to minimize segregation and contamination with foreign materials.

M.01.02—Coarse Aggregates:

Coarse aggregate must be uniform in consistency and only contain clean, hard, tough, durable fragments meeting the criteria in Table M.01.02-1.

TABLE M.01.02-1: Coarse Aggregate Criteria by Pit/Quarry Source

Item	Title	AASHTO Test Methods	Criteria
1	Material Passing No. 200 Sieve	T 11	1% maximum.
2	Loss on Abrasion	T 96	40% maximum
3	Soundness by Magnesium Sulfate	T 104	10% maximum @ 5 cycles

Standard sizes of coarse aggregate for applications other than bituminous concrete must meet the gradation requirements listed in Table M.01.02-2 as determined by AASHTO T 27.

TABLE M.01.02-2: Gradation of Standard Sizes of Coarse Aggregate

Square Mesh Sieves	Percent Passing by Weight					
	No. 3	No. 4	No. 6	No. 67	No. 8	No. 9
2 1/2 inches	100					
2 inches	90-100	100				
1 1/2 inches	35-70	90-100				
1 inch	0-15	20-55	100	100		
3/4 inch		0-15	90-100	90-100		
1/2 inch	0-5		20-55		100	
3/8 inch		0-5	0-15	20-55	85-100	100
No. 4			0-5	0-10	10-30	85-100
No. 8				0-5	0-10	10-40
No. 16					0-5	0-10
No. 50						0-5

M.01.03—Fine Aggregates:

Fine aggregate must consist of clean, hard, durable, tough, uncoated particles free from lumps, meeting the requirements listed in Table M.01.03-1.

TABLE M.01.03-1: Fine Aggregate Requirements

Item	Property	AASHTO Test	Criteria
1	Grading		
	Portland Cement Concrete	T 11 T 27	3% maximum passing No. 200 sieve Table M.01.04-1
	Bituminous Concrete	T 27	100% Passing 3/8 inch, 95% passing the No. 4 min.
2	Absorption	T 84	3% maximum
3	Plasticity limits	T 90	0 or not detectable
4	L.A. Abrasion	T 96	50% maximum (fine agg. particle size \geq No. 8)
5	Soundness by Magnesium Sulfate	T 104	15% maximum@ 5 cycles for PC Concrete 20% maximum@ 5 cycles for Bituminous Concrete
6	Clay Lumps and Friable Particles	T 112	3% maximum
7	Deleterious Material - organic or inorganic calcite, hematite, pyrrhotite, shale, clay, coal-lignite, shells, loam, mica, clinkers, or other organic matter (wood, etc.).	As determined by the Engineer	Must not contain more than 3% by mass of any individual listed constituent and not more than 5% by mass in total of all listed constituents.

Screenings and Dust must meet the requirements of Table M.01.03-2 as determined by AASHTO T 27.

TABLE M.01.03-2: Screenings and Dust Gradation

Square Mesh Sieves	Percent Passing by weight	
	Screenings	Dust
3/8 inch	100	
No. 4		100
No. 8	60-100	40-100

M.01.04—Portland Cement Concrete (PCC) Aggregates:

In addition to the requirements in M.01.01 through M.01.03, the aggregates used in Portland Cement Concrete must meet the following:

All Aggregates: Coarse and Fine aggregates must originate from the aggregate producers and locations included on the [Department's Qualified Materials List \(QML\)](#). The list is available on the Department website. The criteria for inclusion in the QML are stated within the list.

Coarse Aggregate: Coarse aggregate of a size retained on a 1 inch square opening sieve must not contain more than 8% of flat and elongated pieces when tested in accordance to ASTM D4791 at a 1:5 ratio.

Reclaimed concrete aggregates must consist of clean, durable fragments of uniform quality. Materials must be from crushing or otherwise processing of concrete structures or portions thereof. Prior to demolition or removal, concrete structures must not exhibit signs of material degradation and be inspected by the Engineer. Reclaimed aggregate must be tested separately to confirm compliance with all requirements prior to blending with virgin aggregate.

Reclaimed coarse aggregate must not contain chlorides in excess of 0.5 lb./c.y. Chloride content must be determined in accordance with AASHTO T 260, Procedure A. Regardless of chloride content, reclaimed aggregates must not be used in concrete for pre-stressed concrete members.

Fine Aggregate: Manufactured sand must be produced from washed stone screenings; stone screenings or gravel; or combinations thereof, after mechanical screening or with a process approved by the Engineer.

The fineness modulus of fine aggregate from a source must not vary more than 0.20 from the base fineness modulus of that source.

The fine aggregate must not produce a color darker than Gardner Color Standard No. 11 in accordance with AASHTO T 21.

Fine aggregates that fail to meet soundness requirements as specified in Table M.01.03-1, but meet all other requirements, may be used with the approval of the Engineer on a case-by-case basis. Typically concrete composing any surface subject to polishing or abrasion (i.e., wheel traffic or running water) will not be allowed to contain such material.

Gradation of each size aggregate must be within the ranges listed in Table M.01.04-1 as determined by AASHTO T 27.

Table M.01.04-1: Fine Aggregate Gradations

Sieve Size	3/8 inch	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100
% passing	100	95-100	80-100	50-85	25-60	10-30	2-10

M.01.05—Bituminous Concrete Aggregates

In addition to the requirements in M.01.01 through M.01.03, the source of aggregates used in Bituminous Concrete must have a Quality Control Plan for Fine Aggregates (QCPFA) on file with the Engineer. The QCPFA must describe the locations and manufacturing processing methods used at the source. The QCPFA must describe how conformance to Items 1 through 7 in Table M.01.03-1 is monitored and what actions will be taken if nonconformance is observed. The QCPFA must be revised and resubmitted to the Engineer whenever the process, location, or manner of how the fine aggregate is produced or monitored changes. A source of fine aggregate may be suspended by the Engineer due to demonstrated noncompliance with the QCPFA or if consistent production of material does not meet Project specifications as determined by the Engineer.

**SECTION M.07
PAINT**

Replace Section M.07 in its entirety with the following:

**SECTION M.07
PAINT**

- M.07.01—General for All Paints and Enamels**
- M.07.02—Coating Systems for Structural Steel**
- M.07.03—Vacant**
- M.07.04—Vacant**
- M.07.05—Vacant**
- M.07.06—Vacant**
- M.07.07—Vacant**
- M.07.08—Vacant**
- M.07.09—Vacant**
- M.07.10—Vacant**
- M.07.11—Vacant**
- M.07.12—Vacant**
- M.07.13—Vacant**
- M.07.14—Vacant**
- M.07.15—Vacant**
- M.07.16—Vacant**
- M.07.17—Vacant**
- M.07.18—Vacant**
- M.07.19—Vacant**
- M.07.20—Waterborne Pavement Marking Paint**
- M.07.21—Hot-Applied Waterborne Pavement Marking Paint**
- M.07.22—Epoxy Resin Pavement Markings**
- M.07.23—Vacant**
- M.07.24—Preformed Black Line Mask Pavement Marking Tape**
- M.07.25—Vacant**
- M.07.30—Glass Beads**

M.07.01—General for All Paints and Enamels:

1. Paints and enamels shall consist of pigments of the required fineness and composition, ground in the required vehicle by a suitable grinding machine to the required fineness. All pigments, resins, oils, thinners and driers shall be free from adulterants.

2. Proportions: All proportions in formulas are by weight unless otherwise specified.

3. Fineness: All pigments, except aluminum, unless otherwise specified, shall be finely ground with 100% passing the No. 200 sieve; with no less than 97% passing the No. 325 sieve.

4. Curdling, Livering, Leveling: The paint or enamel shall not liver or curdle. The pigment shall remain in suspension in a satisfactory manner through the expected shelf life specified on the label. The enamel type paints shall level properly and not show brush marks.

5. Colors: All paints and enamels shall be matched to the Department's standard shades.

6. Time of Drying: All paints or enamels, unless otherwise specified, shall dry to full gloss in not more than 18 hours.

7. Weight per Gallon: The weight per gallon of all paints and enamels shall be determined at 77°F.

8. Shipping: All paints and enamels shall be shipped in containers plainly marked with the name, net weight and volume of paint or enamel content. The manufacturer's name, address, date and lot number shall be marked on every package.

9. Samples, Sampling, and Testing: The manufacturer shall supply a Certified Test Report per lot for any pigment, oil, resin, thinner, drier or paint. When a portion of the lot is delivered, a Material Certificate is required. Upon request by the Engineer, the manufacturer shall submit a sample.

Sampling and testing shall be performed in accordance with ASTM, Federal Standards, or by methods established by the Department.

M.07.02—Coating Systems for Structural Steel: The coating system used shall be specified in the Contract and shall be selected from the [Northeast Protective Coating Committee's](#) (NEPCOAT's) Specification Criteria for Protective Coatings qualified products list.

Color: The color of the topcoat material shall be as noted on the plans (FS 595 Color Number).

Packaging and Labeling of Coating Material: The container shall be designed to store the specific coating material. Each container of coating material shall bear a label that identifies the name of the coating manufacturer, the name of the product, the lot and batch numbers, the date of manufacture and the shelf life expiration date. The label shall also include complete specific instructions for opening the container and for mixing, thinning, and applying the coating material contained therein. If the coating material cannot be positively identified from the label on the container, it shall not be used.

Delivery: Coating material shall be furnished in the manufacturer's original sealed and undamaged container.

Control of Materials: For each coating material, a Materials Certificate shall be submitted in conformance with 1.06.07. The Material Certificate shall indicate compliance with NEPCOAT Acceptance Criteria for Protective Coatings, List A or B.

M.07.03—Vacant

M.07.04—Vacant

M.07.05—Vacant

M.07.06—Vacant

M.07.07—Vacant

M.07.08—Vacant

M.07.09—Vacant

M.07.10—Vacant

M.07.11—Vacant

M.07.12—Vacant

M.07.13—Vacant

M.07.14—Vacant

M.07.15—Vacant

M.07.16—Vacant

M.07.17—Vacant

M.07.18—Vacant

M.07.19—Vacant

M.07.20—Waterborne Pavement-Marking Paint: Pavement-marking paint shall be waterborne paint and shall be white or yellow, depending on its use, for application on bituminous concrete and Portland cement concrete pavement. This paint shall be compatible with the stripe-painting equipment to be used on the Project. All requirements shall be as specified in M.07.21, except as follows:

1. Total nonvolatile compounds shall not be less than 70% by weight.
2. Pigment shall be 50 to 60% by weight.
3. Drying time for no-pick-up shall be 15 minutes or less when tested in accordance with ASTM D711.
4. The Contractor shall provide a Materials Certificate in accordance with 1.06.07 for each portion of a batch or lot delivered to the Project site.

M.07.21—Hot-Applied Waterborne Pavement-Marking Paint: Fast-drying waterborne pavement-marking paint to be applied on bituminous concrete and Portland cement concrete pavements shall be the color specified on the plans. This paint shall be capable of being applied with stripe-painting equipment at an application temperature of 130 to 145°F and shall have good spraying characteristics. The Contractor shall provide a Materials Certificate in accordance with 1.06.07 for each portion of a batch or lot delivered to the Project site.

General: Specifications and publications that apply are as follows:

- FS TT-P-1952 - Paint, Traffic and Air Field Marking, Waterborne
- Federal Test Method Standard (FTMS) No.141 - Paint, Varnish, Lacquer and Related Materials, Methods of Inspection, Sampling and Testing

- FS No. 595 – Colors

ASTM Standards:

- D211 - Specifications for Chrome Yellow and Chrome Orange Pigments
- D476 - Classification for Dry Pigmentary for Titanium Dioxide Pigments

Detailed Requirements, Formulation and Manufacture: The paint shall be formulated and manufactured from first-grade raw materials and shall be free from defects and imperfections. The materials shall not exhibit settling or jelling after storage in the sealed containers upon receipt. The paint shall provide the proper anchorage, refraction and reflection for the finished glass spheres when applied as specified.

Composition: The composition of the paint material shall meet the requirements of any applicable Federal, State or Local regulation for products of this type and shall meet the following requirements:

1. Paint shall not contain more than 0.06% lead when tested in accordance with ASTM D3335
2. Total nonvolatile organic compounds shall be a minimum of 76% by weight
3. Pigment shall be 58 to 63% by weight when tested in accordance with ASTM D3723
4. Resin solids shall be composed of 100% acrylic emulsion polymer
5. Volatile organic compounds shall not exceed 1.25 lb./gal. excluding water when tested in accordance with ASTM D2369
6. Flash Point: Closed-cup flash point shall not be less than 145°F
7. Density: Weight per gallon shall not be less than 12.5 lb./gal. when tested in accordance with ASTM D1475

Viscosity: The consistency of the paint shall not be less than 80, nor more than 90 Krebs units when tested in accordance with ASTM D562.

Flexibility: The paint shall not show cracking or flaking when tested in accordance with ASTM D522. The panels shall be lightly buffed with steel wool and thoroughly cleaned with solvent before being used for tests.

Dry Opacity: Both white and yellow paints shall have a minimum contrast ratio of 0.96 when tested in accordance with ASTM D2805. Contrast ratio shall be determined by applying a wet film thickness of 0.005 inch to a standard hiding- power chart. After drying, the black- and- white-reflectance values shall be determined using a suitable reflectometer and the contrast ratio determined.

Bleeding: The paints shall have a minimum bleeding ratio of 0.97 when tested in accordance with FS TT-P-1952.

Abrasion Resistance: No less than 210 liters of sand shall be required to remove paint film when tested in accordance with TT-P-1952.

Color: The paint shall not discolor in sunlight and shall maintain colorfastness throughout its life. Color determination shall be made without beads, after a minimum of 24 hours. Color for yellow paint shall be a visual match for FS 595-13538. If not a visual match, the diffuse day color of the paint when tested in accordance with ASTM E1347 shall conform to the CIE Chromaticity coordinate limits as follows:

	x	y	x	y	x	y	x	y	Brightness
White	0.305	0.295	0.360	0.360	0.388	0.377	0.280	0.310	84.0 min
Yellow	0.485	0.455	0.506	0.452	0.484	0.428	0.477	0.438	50.0 min

Glass Bead Adhesion: The paint with glass beads conforming to M.07.30, applied at the rate of 6.0 lb./gal. of paint, shall require not less than 150 liters of sand to remove paint film and glass beads.

Scrub Resistance: The paint shall pass 300 cycles minimum when tested in accordance with ASTM D2486.

Drying Time: Drying time to no pick-up shall be 3 minutes or less when tested in accordance with ASTM D711.

M.07.22—Epoxy Resin Pavement Markings:

General Requirements:

Identification: Each container must be labeled with the following information: Name and address of manufacturer, production batch number, date of manufacture, grade name and/or identification number, type of material, number of gallons, Contract number, directions for mixing and application.

Certification: The Contractor shall provide a Material Certificate in accordance with 1.06.07 for each portion of a batch or lot delivered to the Site.

Detailed Requirements:

- (a) **Epoxy Resin Material:** The material shall be composed of epoxy resins and pigments only. The white and the yellow epoxy resin materials shall be composed of approved materials and be lead- and chromium-free.

- (b) **Composition:**

WHITE (percent by weight)	YELLOW (percent by weight)
20% ± 2% Titanium Dioxide (ASTM D476 Type III)	
80% ± 2% Epoxy Resins	75% ± 2% Epoxy Resins

(c) **Color:** The white material shall be the color of chip 17778 of FS No. 595 of the latest issue, when the material is placed in a type EH weatherometer for a period of 500 hours and weathered according to ASTM G152. The yellow material shall be the color of chip 13538 of the FS No. 595 of the latest issue.

(d) **Adhesion Capabilities:** When the adhesion of the material to Portland cement concrete is tested in accordance with AASHTO T 237, the failure of the system must take place in the concrete.

(e) **Abrasion Resistance:** When the abrasion resistance of the material is tested according to ASTM D4060 with a CS-17 wheel under a load of 1000 grams for 1000 cycles, the wear index shall be no greater than 82.

(f) **Hardness:** The Type D durometer hardness of the material shall be not less than 75 nor more than 90 when tested in accordance with ASTM D2240 after the material has cured for 72 hours at $73^{\circ}\text{F} \pm 3.5^{\circ}\text{F}$.

(g) **Tensile Strength:** The tensile strength of the material, when tested in accordance with ASTM D638, shall not be less than 6,000 psi after 72 hours cure at $73^{\circ}\text{F} \pm 3.5^{\circ}\text{F}$.

(h) **Compressive Strength:** The compressive strength of the material, when tested in accordance with ASTM D695, shall not be less than 12,000 psi after 72 hours cure at $73^{\circ}\text{F} \pm 3.5^{\circ}\text{F}$.

(i) **Shelf Life:** The individual components shall not require mixing prior to use when stored for a period of 12 months.

(j) **Glass Beads:** The glass beads shall meet the requirements of M.07.30.

M.07.23—Vacant

M.07.24—Preformed Black-Line Mask Pavement-Marking Tape:

General Requirements: The preformed, patterned black-line mask pavement- marking tape shall consist of a matte black, non-reflective tape in widths or sizes sufficiently large to mask the existing markings which are to be temporarily covered.

The patterned masking tape shall be pre-coated with a pressure sensitive adhesive and shall be capable of being adhered to existing markings, on bituminous concrete pavement or Portland cement concrete in accordance with the manufacturer's instructions without the use of heat, solvents or other additional adhesives, and shall be immediately ready for traffic use after application. The Contractor shall identify equipment necessary for proper application and removal, and make recommendations for application that will assure effective product performance.

The preformed, patterned black-line masking pavement-marking tape shall be suitable for use for 1 year after the date of receipt when stored in accordance with the manufacturer's recommendations.

Detailed Requirements:

(a) **Composition:** The non-reflective, patterned black-line mask pavement-marking tape shall not contain metallic foil and shall consist of a mixture of high quality polymeric materials, pigments and inorganic fillers distributed throughout its base cross-sectional area, with a matte black non-reflective top layer. The patterned surface shall have a minimum of 20% of the surface area raised and coated with non-skid particles. The channels between the raised areas shall be substantially free of particles. The film shall be pre-coated with a pressure sensitive adhesive. A non-metallic medium shall be incorporated to facilitate removal.

(b) **Skid Resistance:** The surface of the patterned, non-reflective black-line mask pavement-marking tape shall provide an initial average skid resistance value of 60 British Pendulum Number when tested in accordance with ASTM E303.

(c) **Thickness:** The patterned material, without adhesive, shall have a minimum thickness of 0.065 inch at the thickest portion of the patterned cross-section and a minimum thickness of 0.02 inch at the thinnest portion of the cross-section.

(d) **Adhesion:** The black-line mask pavement- marking tape shall adhere to the pavement and existing pavement markings under climatic and traffic conditions normally encountered in the construction work zone.

(e) **Removability:** The black-line mask pavement-marking tape shall be capable of being removed after its intended use without the use of heat, solvents, grinding, sand or water blasting.

M.07.25—Vacant

M.07.30—Glass Beads: The glass beads shall meet the requirements of AASHTO M 247, Type 1 or 4, depending on application.

**SECTION M.08
DRAINAGE**

M.08.01—Pipe:

Revise the second sentence of Subarticle M.08.01-6 as follows:

6. Metal Culvert End:

Bolts and fittings shall meet the requirements of ASTM A307 and shall be galvanized to meet the requirements of ASTM F2329.

Revise Subarticle M.08.01-7(g) as follows:

7. Reinforced Concrete Pipe:

(g) **Certification:** Pipe will be accepted by the Department on the basis of manufacturer's certification. The manufacturer shall certify each shipment of pipe on Department Form MAT-314 (PC-1), "Certification of Precast Concrete Products." Two (2) copies of this certification shall be furnished with the shipment to the Engineer at the Project Site.

Revise Subarticle M.08.01-8 as follows:

8. Reinforced Concrete Elliptical and Arch Pipe:

Reinforced concrete elliptical pipe shall be in accordance with AASHTO M 207, Class HE IV. Reinforced concrete arch pipe shall be in accordance with AASHTO M 206, Class A IV. Manufacturing and testing for both pipes shall meet M.08.01-7.

Delete the only sentence of the second paragraph of Subarticle M.08.01-10 that begins "Elastomeric polymer sealer shall ..."

Revise Subarticle M.08.01-17 as follows:

17. Flexible, Watertight, Rubber Gaskets:

This material, for use in sealing of joints in concrete drainage structures, shall meet the requirements of ASTM C443.

Revise Subarticle M.08.01-18 as follows:

18. Corrugated Polyethylene Pipe: Corrugated polyethylene pipe shall meet the requirements of AASHTO M 252 for diameters 3 to 10 inches and M 294 for diameters 12 inches and over.

M.08.02—Catch Basins, Manholes and Drop Inlets

Revise Subarticle M.08.02-5 as follows:

5. Metal for Drainage Structures: Metal for catch basins, drop inlet and manhole frames, extensions, covers, and gratings shall be cast iron, structural steel or malleable iron meeting the requirements of the plans. Covers and gratings shall bear uniformly on their supports.

Extension risers shall be designed so that the existing manhole cover or catch basin grate, when set in place, will have substantially the same bearing, fit and load carrying capacity as in the existing frame. The extension shall be designed to fit into the original frame, resting specifically on the flange and rim area. The extension shall accept the existing cover or grate so that the cover or grate is seated firmly without movement.

Steps (ladder rungs) for manholes shall conform to AASHTO M 199 (ASTM C478).

Cast iron shall meet the requirements of AASHTO M 306 "Standard Specification for Drainage, Sewer, Utility and Related Castings," and must be certified to the loading standard of H-25 or HS-25 as detailed in AASHTO M306, Section 6 "Proof-Load Testing." Cast iron material shall be Class 35B Gray Iron or Ductile Iron, minimum 50 ksi yield strength.

Gray Iron Castings shall meet the requirements of ASTM A48 and AASHTO M 105, Class 35B, and must meet all minimum requirements of AASHTO M 306. All covers, grates and frames must be rated H-25 in accordance

with AASHTO M 306, Section 6 "Proof-Load Testing."

Ductile Iron Castings shall meet the requirements of ASTM A536, 80-55-06 or 70-50-05, and must meet all minimum requirements of AASHTO M 306. All covers, grates and frames must be rated H-25 in accordance with AASHTO M 306, Section 6 "Proof-Load Testing."

Structural Steel shall meet the requirements of ASTM A36, or A283, Grade B or better, as to quality and details of fabrication, except that in the chemical composition of the steel, the 2/10 of 1% of copper may be omitted.

Malleable iron shall meet the requirements of ASTM A47, Grade 22010.

The materials and method of manufacture for drop inlets shall conform to the requirements as stated on the plans or as ordered.

M.08.03—Aggregates:

Revise Subarticles M.08.03-1 and M.08.03-2 as follows:

1. Bedding Material: Material for pipe bedding shall be sand or sandy soil, all of which passes a 3/8 inch sieve, and not more than 10% passes a No. 200 sieve.

When ground water is encountered, the Engineer may allow No. 6 stone conforming to M.01.02 to be used instead of sand or sandy soil.

2. Aggregates for Underdrains: Materials for filling the trench shall consist of well-graded, clean, non-plastic sands or well-graded, clean, durable broken stone or screened gravel. Unless otherwise noted, the type of material to be used shall be sand.

Sand: This material shall meet the requirements of M.03.01-2.

Broken Stone or Screened Gravel: The crushed stone shall meet the gradation requirements of Table M.01.02-2 for Size No. 8 coarse aggregate.

**SECTION M.09
SHEET PILING AND PILES**

Replace the first two subarticles in Article M.09.02 with the following:

M.09.02—Piles: The materials for this work shall meet the following requirements:

1. Timber Piles: Timber piles shall meet the requirements of AASHTO M 168, as supplemented by the following:

All timber piles shall be cut from sound, live trees. Piles shall contain no unsound knots or other defects which may impair their strength and durability. All knots shall be trimmed close to the body of the piles. All measurements for piles shall be taken under the bark.

Piles shall have the following minimum dimensions:

Pile Length	Tip Dia. Inches	Butt Dia. Inches
20 feet and under	8	11
21 to 40 feet	8	12
41 to 60 feet	7	13
Over 60 feet	6	15

2. Treatment of Timber Piles: Treated timber piles shall be made of douglas fir, western larch, southern yellow pine, Norway pine or red oak. They shall be peeled of outer bark and inner skin soon after cutting so that the piles are smooth and clean. Piles shall contain as much sapwood as possible, and care shall be taken to minimize damage to the sapwood when peeling and cleaning the piles. After preparation, the minimum thickness of the sapwood ring at the butt end shall be 1 inch, except for southern yellow pine which shall be 1 1/2 inches.

Conditioning, treatment and wood preservative shall meet the requirements of AASHTO M 133 and AWPA Standards U1 and T1, UC5A.

The minimum retention of preservative shall be in accordance with AWPA Standards.

Prior to furnishing the treated timber piles, the Contractor shall submit a Materials Certificate, in accordance with 1.06.07, certifying the species, grade or class of pile material, the grade of wood preservative used and the preservative retention.

SECTION M.10
RAILING AND FENCE

Replace Article M.10.01 with the following:

M.10.01—Cable Guide Railing and Anchorages: The materials for this work shall meet the following requirements:

1. Wire Rope: Wire rope shall be Class A, 3/4 inch diameter, meeting the requirements of AASHTO M 30.

2. Fittings: All fittings shall meet the details as shown on the plans. Fittings subject to the direct action of the wire rope shall be sufficiently strong to develop the full-specified tensile strength of the rope. Fittings used in the attachment of 2 ropes shall be sufficiently strong to develop the full-specified tensile strength of both ropes. Other fittings shall be in accordance with standard commercial specifications, and shall be free from flaws or defects that would tend to impair their use or durability.

All metal fittings shall be galvanized, after fabrication, to meet the requirements of ASTM A153.

3. Steel Posts: All steel posts shall meet the requirements of ASTM A36.

Steel posts shall meet the details shown on the plans as to size, shape and weight; and they shall be punched or drilled as indicated on the plans. After fabrication, all posts shall be galvanized to meet the requirements of ASTM A123.

4. Anchorages: Anchorages shall be as shown on the plans.

5. Wood Posts: Wood posts shall meet the requirements of M.10.04-2 except that the diameter shall be as shown on the plans.

6. Steel Eyebolt and Standard Turnbuckle: The steel eyebolt and standard turnbuckle shall meet the requirements of ASTM A237 and shall be galvanized to meet the requirements of ASTM F2329.

7. Connector Plate Bolts: The connector plate bolts shall meet the requirements of ASTM F3125 Grade A325 and shall be galvanized to meet the requirements of ASTM F2329.

8. Cast Steel Connector Plate: The cast steel connector plate shall meet the requirements of ASTM A27, Grade 65-35 and shall be galvanized to meet the requirements of ASTM A123.

9. Malleable Iron Connector Plate: The malleable iron connector plate shall meet the requirements of ASTM A47, Grade No. 32510 and shall be galvanized to meet the requirements of ASTM A123.

Replace Article M.10.02 with the following:

M.10.02—Metal Beam-Type Rail and Anchorages: The materials for this work shall comply with the plans as to size, shape and weight.

1. Steel Posts, Welded-Soil Plates, Brackets, Back-Up Rails and Channel Rubrails:

(a) Steel posts, welded-soil plates, brackets, back-up rails and channel rubrails shall meet the requirements of ASTM A36. After fabrication, all steel posts, welded-soil plates, brackets, back-up rails and channel rubrails shall be galvanized to meet the requirements of ASTM A123.

(b) All welding shall meet ANSI/AASHTO/AWS D1.5.

2. Wood Posts: Wood posts shall be commercial lumber Grade No. 1 or better and shall meet AASHTO M 168. The posts shall be either rough sawn (non-planed) or S4S (surface four sides) southern yellow pine or douglas fir, or western larch with nominal dimensions as indicated on the plans. Actual dimensions of the posts shall not vary by more than 1/4 inch from the dimensions shown on the plans.

After all end cuts are made and all holes are drilled the wood shall be treated in accordance with AASHTO M 133 and the AWPA Standards.

3. Rail Elements (W-Beam, Thrie-Beam) and Terminal Sections: Rail elements and terminal sections shall meet the requirements of AASHTO M 180 and the following:

(a) **Class A (12 gauge):** Base metal nominal thickness, 0.105 inch

(b) **Class B (10 gauge):** Base metal nominal thickness, 0.135 inch

(c) Galvanizing shall be Type II.

(d) Acceptance shall be based on AASHTO M 180 Article 5.3 "Acceptance by Brand Registration and Guarantee."

(e) Rail elements with radii less than or equal to 150 feet, as shown on the plans, shall be shop fabricated and then permanently stamped or embossed with the designated radius (R = _____) on the element near the brand registration stamp.

4. Box Beam Rail Elements: Elements shall be either structural tubing 8 inches × 6 inches × 1/4 inch or structural tubing 6 inches × 6 inches × 3/16 inch manufactured from either ASTM A500 Grade B cold-rolled tubing, ASTM A501 hot-rolled tubing or Automatic Rollover Protective Steel. When ASTM A500 Grade B steel is used, the DROP-Weight-Tear Test in conformance with ASTM E436 shall be performed. All plates shall meet ASTM A36. All material for box beam rail elements and splices shall be galvanized after fabrication in accordance with ASTM A123.

5. Steel Plates, Steel Washer Plates and Square Steel Washers: These components shall meet the requirements of ASTM A36 and shall be galvanized to meet the requirements of ASTM A123 unless otherwise noted on the plans.

6. Bolts, Rods, Washers, and Nuts: Anchor bolts and rods for attachment to barriers and parapets shall meet ASTM A449. The nuts for anchor bolts and rods shall meet ASTM A563, Grade B. The washers for anchor bolts or rods shall meet the requirements of ASTM F436. All other bolts and nuts, unless otherwise noted on the plans, shall meet the requirements of ASTM A307.

Bolts, nuts and washers, unless otherwise noted on the plans, shall be galvanized after fabrication to meet the requirements of ASTM F2329.

7. End Anchorages: The bar reinforcement shall meet the requirements of M.06.01-1. The Class “A” concrete shall meet the requirements of M.03. Anchor bolts and rods for end anchorages shall meet the requirements of AASHTO M 314.

8. Galvanized Coating Touch-up: The zinc dust-zinc oxide paint for galvanized coating touchup shall meet the requirements of AASHTO M 180.

9. Plastic Blockouts: Plastic blockouts shall be made with a minimum of 50% recyclable polyethylene plastic comprised of low-density and high-density polyethylene with a specific gravity less than or equal to 1.0 in accordance with ASTM D792 and be recyclable. They shall also have a minimum compressive stress of 450 psi in accordance with ASTM D695, meet the dimensions indicated on the plans, and be a shade of gray or black. Blockouts must have been crash-tested and have approval in writing by the FHWA in compliance with MASH, Test Level 3 requirements. Each blockout shall be stamped at the factory with the manufacturer’s identification and lot number. The Contractor shall furnish to the Engineer prior to construction a Certified Test Report and a Materials Certificate for the blockouts in conformance with 1.06.07.

Replace Article M.10.04 with the following:

M.10.04—Wire Fence:

1. Wire Fence: The wire fence shall be 9 gauge woven wire fence and shall be hot-dip galvanized in accordance with ASTM A116.

Staples shall be No. 9 galvanized wire staples 1 1/2 inches long. Nails shall be 16d galvanized.

Vertical stays, securely welded to the horizontal wires, shall be provided at equal intervals and shall run from top to bottom of the fence.

2. Treated Wood Posts: Wood posts and wood braces for wire fence shall meet the requirements of AASHTO M 168 and shall be cut from one of the following species: Norway (red) pine, southern yellow pine, scotch pine, pitch pine, oak, red maple, black birch or yellow birch.

All posts shall be straight of the size and length shown on the plans. The wood bracing shall be 4 inches × 4 inches as shown on the plans.

Conditioning, treatment and wood preservative shall meet the requirements of AASHTO M 133 and AWPA Standards U1 and T1 for UC4B Commodity Specification B (Posts). All posts and braces shall be treated for their full length.

3. Metal Post: Metal posts shall be of the length shown on the plans, straight and true to section, and shall be of a standard commercial type. Hot-dip galvanizing shall be in accordance with ASTM A116, Class 2.

All posts, braces, anchors, plates, hardware and other devices shall be galvanized on all inner and outer surfaces by an approved method.

All end posts shall have 1 brace; all corner and intermediate braces or pull posts shall have 2 braces.

(a) Line posts shall be of the following types and shall meet the minimum requirements stated for each:

- Quadruple Ribbed Tee Post with minimum weight of 1.32 lb./l.f.
- Channel or U Post with minimum weight or 1.12 lb./l.f.

- Standard Tee Post with minimum weight of 1.22 lb./l.f.
- Tubular Post with minimum outside diameter 1 3/4 inches minimum gauge No. 15 (U.S. Standard)
- Angle Post with minimum section 2 inches × 2 inches × 1/4 inch
- (b) End posts, corner posts, brace posts and braces shall be of the following types and shall meet the minimum requirements stated for each:
 - Tubular Section Post and Brace with minimum outside diameter 2 1/2 inches, minimum gauge No. 8 (U.S. Standard)
 - Standard Pipe Section Post and Brace with minimum weight of 3.65 lb./l.f.
 - Angle Post and Brace with minimum section of post 2 1/2 inches × 2 1/2 inches × 1/4 inch, minimum section of brace 2 inches × 2 inches × 1/4 inch

The minimum weights stated for the several types of posts do not include anchors, plates or other devices. Intermediate or line posts shall be provided with a plate or anchor or other satisfactory means to hold the posts in proper alignment and plumb. Plates or anchors shall be securely fastened to the post by welding or by a minimum of 2 rivets per plate.

All posts having a tubular or pipe section shall be provided with a suitable cap at the top.

Replace Article M.10.05 with the following:

M.10.05—Chain Link Fence: All gauge measurements of finished wire shall be United States Steel Wire Gauge or equivalent. Tolerance for wire sizes shall be as specified in AASHTO M 181. When aluminized (aluminum-coated) steel fabric is used, the posts and hardware shall be galvanized. When aluminum fabric is used, the posts and hardware shall be aluminum. When polyvinyl chloride-coated steel fabric is used, the posts and hardware shall be polyvinyl chloride-coated.

Materials for this work shall meet the following requirements:

1. Fabric: Wire fencing shall be composed of chain link woven wire. It shall be the height specified on the plans and shall be constructed of 9 gauge wire. The wire shall be woven to form a continuous fabric having 2 inch mesh. The chain link fabric shall have a knuckled finish on both top and bottom edges.

- (a) Aluminized Steel Fabric: The base metal of the fabric shall be of steel wire having a minimum tensile strength of 80,000 psi, coated with aluminum alloy applied at the rate of not less than 0.40 ounces/square foot of uncoated wire surface.
- (b) Polyvinyl chloride-coated steel fabric shall meet the requirements of ASTM D1785, and shall be the color black or as noted on the plans.
- (c) Aluminum Alloy Fabric shall meet the requirements of ASTM B211, Alloy 6061 wire having a minimum tensile strength of 50,000 psi.

2. Metal Posts and Rails: Metal posts shall be straight, true to section and of sufficient length to enable the post to be encased for a depth of 3 feet deep into a concrete footing which shall have a depth 3 feet 6 inches below ground.

The Contractor shall provide a Materials Certificate in accordance with 1.06.07 for all posts, rails, braces, anchors, plates and other devices with coating of the following types, which shall meet the minimum requirements for each:

- (a) Galvanized material shall be made of steel of a standard commercial type meeting the requirements of ASTM F1083 High Strength Grade Schedule 40 and ASTM F1043 Group 1A. It shall be hot-dip galvanized with a zinc coating weighing not less than 2.0 ounces/square foot when tested in accordance with AASHTO T 65 and shall be in accordance with AASHTO M 181, Grade 2.
- (b) Aluminized steel posts and rails shall meet ASTM F1043, minimum yield strength 50,000 psi, for industrial chain link fence. The posts and rails shall be manufactured by roll forming aluminum coated steel strip and electric resistance welding into tubular form. The outside of the weld area shall be metallized with commercially pure aluminum to a thickness sufficient to provide resistance to corrosion equal to that of the remainder of the outside of the tube. The aluminum coating weight on the outer and inner surfaces shall be a minimum of 0.75 ounces/square foot, Triple spot test, 0.70 ounces/square foot, single spot test, as measured in accordance with ASTM A428 and shall meet the requirements of ASTM F1043 Group 1C.
- (c) Polyvinyl chloride-coated material shall be made of steel of a standard commercial type coated inside and outside with the same polyvinyl chloride coating as the chain link mesh, or shall have all

surfaces galvanized with the outside galvanized surface coated with the same polyvinyl chloride coating as the chain link mesh.

(d) Aluminum alloy shall meet the requirements of ASTM B211.

3. Fittings: These shall be malleable iron, pressed steel, or aluminum alloy. The fittings shall be either hot-dip galvanized, polyvinyl chloride-coated, or aluminum alloy.

(a) Hot-dip galvanizing shall meet the requirements of ASTM A153.

(b) Polyvinyl chloride-coated material shall have the same polyvinyl chloride coating as the chain link mesh.

(c) Aluminum alloy shall meet the requirements of ASTM B211.

4. Tension Wire, Tie Wire and Hog Rings:

(a) Tension wire for steel fence shall be coil spring steel and shall be 7 gauge. The base material shall have a minimum tensile strength of 80,000 psi with an aluminum coating applied at a rate of 0.40 ounces/square foot of surface area.

Aluminum tension wire shall be 7 gauge ASTM B211 Alloy 6061-T6 or 5052-H38 Aluminum Alloy.

(b) Tie wire for fastening fabric to line posts shall be 6 gauge. Tie wires or hog rings used to fasten the fabric to the top rail or tension wire shall be 9 gauge aluminum for aluminized or aluminum fabric fence, and 9 gauge polyvinyl chloride coated steel wire for polyvinyl chloride fence.

(c) Aluminized steel hog rings for aluminized fabric shall be 9 gauge.

5. Gates: Gates shall be of the same type of materials used for the chain link fence.

Replace Article M.10.08 with the following:

M.10.08—Three-Cable Guide Railing (I-Beam Posts) and Anchorages:

1. Wire Rope: Wire rope shall be Class A coating, 3/4 inch diameter, Type 1 construction conforming to AASHTO M 30.

2. Fittings:

(a) Material indicated on the plan as "Cast Steel" shall meet the requirements of ASTM A27 Grade 70-40 Class 1.

(b) Material indicated on the plan as "Malleable Iron" shall meet the requirements of ASTM A47, Grade 32510.

(c) The cable wedge for splices and cable fittings shall be malleable iron casting conforming to ASTM A47 Grade 32510. The cable wedge shall be uncoated (black).

(d) The cable splice shall meet the requirements of ASTM A536 Ductile Iron Grade 65-45-12. All cable ends and splices shall meet the details on the plans and have the properties necessary to develop the full tensile strength (25,000 lb.) of 3/4 inch wire rope.

(e) The spring cable end assembly (compensating device) casting shall meet the requirements of ASTM A47 Grade 32510 and must have a spring rate of 450-500 lb./inch and a total available throw of 6 inches minimum.

(f) Hook bolts, as installed, shall develop an ultimate pull-open strength from 500 lb. to 1,000 lb. applied in a direction normal to the longitudinal axis of the post.

(g) Steel turnbuckle cable end assembly shall be pearlitic malleable iron casting conforming to ASTM A220 Grade 50005.

(h) Standard hex nuts and lock nuts shall meet the requirements of ASTM A563 Grade B.

(i) After fabrication, all metal fittings and forged cast fittings required by the plans to be galvanized shall be galvanized to meet the requirements of ASTM A153.

3. Steel Posts and Welded-Soil Plates: All steel posts and welded-soil plates shall meet the requirements of ASTM A36. All required holes shall be punched or drilled. After fabrication, all posts and welded soil-plates shall be galvanized to meet the requirements of ASTM A123. All welding shall meet ANSI/AASHTO/AWS D1.5.

4. Anchorages: Class "A" concrete shall meet the requirements of M.03. Bar reinforcement shall meet the requirements of M.06.01-1.

Breakaway anchor angles, washers and anchorage plates shall meet the requirements of ASTM A36. Anchor bolts and rods for end anchorages shall meet the requirements of AASHTO M 314. Hex nuts shall meet the requirements of ASTM A563 Grade B. Breakaway anchor-angle tiepin shall be 3/16 inch

diameter meeting the requirements of ANSI CR1018 and galvanized after fabrication to meet the requirements of ASTM A123. The angles shall be galvanized after fabrication to meet the requirements of ASTM A123. Rods, top nuts and washers shall be galvanized in accordance with the requirements of ASTM F2329.

**SECTION M.12
BEARING AREAS
RIPRAP
SLOPE PAVING & SLOPE PROTECTION
WATERPROOFING AND DAMPPROOFING
STONE AND GRANITE SLOPE CURBING
CALCIUM CHLORIDE FOR DUST CONTROL
WOOD**

Replace Article M.12.02 with the following:

M.12.02—Riprap: Materials for this item shall consist of sound, tough, durable and angular rock, free from decomposed stones or other defects impairing its durability. The size of a stone as hereinafter specified shall be its least dimension. Broken concrete or rounded stones are not acceptable. The type of material to be used shall be as noted on the plans, in the special provisions or as may be ordered by the Engineer.

1. **Standard Riprap:** This material shall conform to the following requirements:
 - (a) Not more than 15% of the riprap shall be scattered spalls and stones less than 6 inches on any side.
 - (b) No stone shall be larger than 30 inches on any side, and at least 75% of the weight shall be stones at least 15 inches.
2. **Intermediate Riprap:** This material shall conform to the following gradation:

Stone Size	% of the weight
18 inches	0
10 to 18 inches	30-50
6 to 10 inches	30-50
4 to 6 inches.	20-30
2 to 4 inches	10-20
less than 2 inches	0-10

3. **Modified Riprap:** This material shall conform to the following gradation:

Stone Size	% of the weight
10 inches	0
6 to 10 inches	20-50
4 to 6 inches	30-60
2 to 4 inches	30-40
1 to 2 inches	10-20
less than 1 inch	0-10

4. **Special Riprap:** The crushed stone shall meet the gradation requirements of Table M.01.02-2 for No. 3 coarse aggregate.

Replace Article M.12.06 with the following:

M.12.06—Stone Curbing: The materials for this work shall meet the following requirements:

1. **Granite Curbing:** Stone for this work shall be hard and durable granite, fundamentally of light color, of general uniform texture, of smooth splitting appearance, free from seams or imperfections that would impair its structural reliability and containing only such color variations as in the opinion of the Engineer would reasonably be characteristic of the material source. The Contractor shall submit for approval, the name of the quarry and the type of curb which the Contractor proposes to use. Samples of curbing shall be submitted for approval only when requested by the Engineer. Such submission shall be made sufficiently in advance of ordering so that the Engineer may have an opportunity to judge the stone, both as to quality and appearance. No stone from any other quarry shall be used unless it has been properly approved.

The finish and surface dimensions for the curb shall conform to the following requirements:

The curbstone shall have a top surface free from wind; it shall be pointed, peen-hammered or sawed to an approximately true plane, and shall have no projections or depressions greater than 1/8 inch. The front and

back arris lines shall be pitched straight and true.

On the back surface of the curbstone there shall be no projection for 3 inches down from the top which would fall outside of a plane having a batter of 4 inches per 12 inches from the back arris line.

The front face shall be at right angles to the plane of the top and shall be smooth quarry-split, free from drill holes in the exposed face. There shall be no projections greater than 3/4 inch, or depressions greater than 1/2 inch, measured from the vertical plane of the face through the top arris line for a distance of 8 inches down from the top. For the remaining distance, there shall be no projections or depressions greater than 1 inch measured in the same manner. The arris lines at the ends shall be pitched with no variation from the plane of the face greater than 1/8 inch.

The ends of all stones shall be square with the planes of the top and face and so finished that, when the stones are placed end to end as closely as possible, no space more than 1/2 inch shall show in the joint for the full width of the top or down on the face for 8 inches. On curbstones having a length of 6 feet or more, the remainder of the end may break back not over 9 inches; whereas, on shorter curbstones, they shall not break back more than 6 inches.

If sawed, the curbstones shall be thoroughly cleaned of any iron rust or iron particles.

Curbstones to be set on a radius of 100 feet or less shall be cut to the curve required, and their ends shall be cut on radial lines. Requirements for length of individual stones in curved curbing vary with radii of curves.

2. Bluestone Curbing: Stone for this work shall be of a good grade, free from structural defects, and shall be approved by the Engineer.

It shall meet the requirements contained hereinbefore for granite curbing, except that the top surface and the top 8 inches of the front face shall be "fine-pointed" in conformity with the requirements of M.11.01 for masonry facing stone.

Replace Article M.12.07 with the following:

M.12.07—Granite Slope Curbing: The materials for this work shall meet the following requirements.

1. Granite Slope Curbing: Stone for this work shall be hard and durable granite, fundamentally of light color, of general uniform texture, of smooth-splitting appearance, free from seams or imperfections that would impair its structural reliability and containing only such color variations as, in the opinion of the Engineer, would reasonably be characteristic of the material source. The exposed face of all curbing shall be smooth, quarry-split to an approximate true plane, and shall have no projections or depressions which will cause over 1 inch to show between a 2 foot straightedge and the face when the straightedge is placed as closely as possible on any part of the face. If projections on the face are more than that specified, they shall be dressed off. The top arris line at the face shall be pitched to a line which shall not show over 1 inch in any direction between the stone and a straightedge the full length of the stone. The bottom arris line at the face shall be pitched so that not over 1 inch shall show between the stone and a straightedge, the full length of the stone, when viewed at right angles to the plane of the face. The ends shall be square to the plane of the face and so finished that when the stones are placed end to end as closely as possible, no space more than 1 1/2 inches shall show in the joint for the full width of the face. The arris lines at the ends shall be pitched with no variation from the plane of the face more than 1/4 inch. Drill holes not more than 3 1/2 inches long, not more than 1/2 inch deep, will be permitted. The sides shall not be under the square more than 4 inches or over the square at the back more than 1 inch.

The straight slope curbing shall be in lengths of not less than 2 feet. The curved slope curbing shall be in lengths of at least 6 inches. The curbing shall have a minimum thickness of 3 inches and a maximum thickness of 6 inches.

When the slope curbing is set adjacent to concrete pavement or gutters, the width of the face of the curbing shall be 12 inches, with a tolerance of plus or minus 1/2 inch. When set adjacent to surfaces other than concrete, the curbing finished shall have a face width of not more than 13 inches and not less than 11 inches.

2. Mortar: The mortar for this work shall conform to M.11.04.

3. Gravel Base: The gravel base under the slope curbing shall be granular fill conforming to M.02.03.

Replace Article M.12.13 with the following:

M.12.13—Wood: All wood materials for this work shall be manufactured in accordance with AASHTO

M 168.

The Contractor shall submit a Materials Certificate in accordance with 1.06.07.

Treatment for wood shall be with a preservative suitable for the conditions of exposure in accordance with AASHTO M 133 and the AWWA Standards U1 and T1. Preservatives shall not be interchanged. End results of treatment, post treatment handling and quality control shall be in accordance with AWWA Standards U1 and T1 for commodities UC4B, UC4C and UC5A, for the type and use specified.

1. Wood in contact with or immersed in water, such as piers, docks, ferry slips, boardwalks, wharvesfs, bridges, etc. shall be one of the following: bongossi, ekki, or azobe, bonalim or greenheart.

Dolphin piles, bulkheads or lead-in jetties shall be one of the following: basralocus greenheart or bongossi, ekki or azobe in order of preference.

2. Wood in contact with the ground such as piles, noise-walls, bulkheads, etc. shall be one of the following: bongossi, ekki or azobe, bonalim, greenheart, pressure treated southern yellow pine, douglas fir or western larch.

3. Wood in above ground use such as decking, railings, bridges, noise walls and platforms shall be one of the following: bongossi, ekki or azobe, bonalim or greenheart.

Pressure treated wood, where specified shall be No. 1 KD or better southern yellow pine, douglas fir or western larch. Pressure treated wood shall be stained or painted as specified in the plans or special provisions.

**SECTION M.13
ROADSIDE DEVELOPMENT**

Replace Section M.13 in its entirety with the following:

**SECTION M.13
ROADSIDE DEVELOPMENT**

M.13.01—Topsoil and Planting Soil**M.13.02—Agricultural Ground Dolomitic Limestone****M.13.03—Fertilizer****M.13.04—Seed Mixtures****M.13.05—Mulch Materials****M.13.06—Compost****M.13.07—Plant Materials****M.13.08—Sod****M.13.09—Erosion Control Matting****M.13.01—Topsoil and Planting Soil:**

1. Topsoil: The term topsoil used herein shall mean a soil meeting the soil textural classes established by the USDA Classification System based upon the proportion of sand, silt, and clay size particles after passing a No. 10 sieve and subjected to a particle size analysis. The topsoil shall contain 5% to 20% organic matter as determined by loss on ignition of oven-dried samples dried at 221°F. The pH range of the topsoil shall be 5.5 to 7.0.

The following textural classes shall be acceptable:

1. Loamy sand, including coarse, loamy fine, and loamy very fine sand, with not more than 80% sand
2. Sandy loam, including coarse, fine and very fine sandy loam
3. Loam
4. Clay loam, with not more than 30% clay
5. Silt loam, with not more than 60% silt
6. Sandy clay loam, with not more than 30% clay

All textural classes of topsoil with greater than 80% sand content will be rejected.

The topsoil furnished by the Contractor shall be a natural, workable soil that is screened and free of subsoil, refuse, stumps, roots, brush, weeds, rocks and stones over 1 1/4 inches diameter, and any other foreign matter that would be detrimental to the proper development of plant growth.

The Contractor shall notify the Engineer of the location of the topsoil at least 15 calendar days prior to delivery. The topsoil and its source shall be inspected and approved by the Engineer before the material is delivered to the Project. Material delivered to the Project which does not meet specifications or which has become mixed with undue amounts of subsoil during any operation at the source or during placing and spreading, will be rejected and shall be replaced by the Contractor with acceptable material.

When topsoil is not furnished by the Contractor, it shall be material taken from the Site in accordance with 2.02 or furnished by the State.

2. Planting Soil: Soil Material to be used for plant backfill shall be one of the following textural classes:

1. Loamy sand, with not more than 80% sand
2. Sandy loam
3. Loam
4. Clay loam, with not more than 30% clay
5. Silt loam, with not more than 60% silt
6. Sandy clay loam, with not more than 30% clay

Planting soil shall be premixed, consisting of approximately 15 % compost, 10% peat, with topsoil and/or native soil. Planting soil shall be loose, friable, and free from refuse, stumps, roots, brush, weeds, rocks and stones 2 inches diameter. In addition, the material shall be free from any material that will prevent proper development and plant growth.

- (a) For ericaceous plants and broad-leaved evergreens requiring an acid soil, planting soil shall have a true pH of 4.5 to 5.5. If it has not, it shall be amended by the Contractor at its expense to the proper pH range by mixing with sulphur.

- (b) Planting soil for general planting of nonacid-loving plants shall have a true pH value of 5.6 to 6.5. If it has not, it shall be amended by the Contractor at its expense to the proper pH range by mixing with dolomitic limestone.

The Engineer reserves the right to draw such samples and to perform such tests as deemed necessary to ensure that these specifications are met.

The amount of sulphur or limestone required to adjust the planting soil to the proper pH range appropriate for its use (above) shall be determined by the Contractor based on the physical testing of a representative sample of the material. Testing must be documented in accordance with the Department’s “Minimum Schedule for Acceptance Testing,” found in Chapter 8 in the [Department's Materials Testing Manual](#). Limestone shall meet the requirements of M.13.02. Sulphur shall be intended for agricultural use and packaged in containers with the manufacturer’s name, chemical analysis and net weight clearly shown on the container. The Contractor shall follow the manufacturer’s recommended procedures for application of the sulphur to the soil.

M.13.02—Agricultural Ground Dolomitic Limestone: Agricultural ground dolomitic limestone shall conform to the standards of the Association of Official Agricultural Chemists (AOAC), and must comply with all existing State and Federal regulations.

The material must comply with the following gradation:

Square Mesh Sieves	Percent Passing By Weight
Pass No. 10	100
Pass No. 20	95
Pass No. 100	50
The minimum calcium carbonate equivalent shall be	90

The Engineer reserves the right to draw such samples and perform such tests as deemed necessary to assure that these specifications are met.

M.13.03—Fertilizer: Fertilizer shall be slow release and commercial grade granular 10-10-10 fertilizer. At least 40% of the nitrogen content shall be slow release, phosphorus shall be available phosphoric acid, and potassium shall be water soluble potash. The fertilizer shall be delivered to the Project in new, clean, sealed containers which bear a label fully describing the contents, the chemical analysis of each nutrient, the fertilizer grade, the net bulk, the brand, and the name and address of the manufacturer. The fertilizer and labels shall conform to all existing State and Federal regulations, and shall meet the standards of the AOAC.

The delivery of each shipment of fertilizer to the Project shall be accompanied by a properly executed and acceptable affidavit of the form shown herein. The affidavit shall be submitted to the Engineer. The Engineer reserves the right to draw such samples and perform such tests as may be deemed necessary to ensure compliance with these specifications.

Form for Affidavit - Fertilizers (Official Stationery of Supplier)

Date _____
To Whom It May Concern:
I hereby certify that I have sold and delivered _____ tons of commercial fertilizer of _____ grade. This material is designated as our batch number(s) _____ and was delivered to _____ for _____ (Contractor’s Name)
Connecticut Department of Transportation Project Number(s): _____ at _____, Connecticut. The material was delivered on _____. The labels and contents meet all State and Federal regulations. The mixture consists of: (List analyses of each major plant nutrient as percent by weight)

Signature _____ (Company Official)
Signature and Seal _____ Notary Public

Should the material fail to meet these specifications, the Contractor shall supply additional acceptable material and perform such work necessary to rectify the deficiencies without cost to the State.

M.13.04—Seed Mixtures:

(a) The grass seed mixture shall conform to the following:

<u>Species</u>	<u>Proportion By Weight Pounds</u>	<u>Minimum Purity (Percent)</u>	<u>Minimum Germination (Percent)</u>
VELVET BENTGRASS, (<u>AGROSTIS CANINA</u>) CERTIFIED VARIETY: OR EQUAL CERTIFIED VARIETY;	25	96	85
RED FESCUE (<u>FESTUCA RUBRA L. SSP. RUBRA</u>) CERTIFIED VARIETY: OR EQUAL CERTIFIED VARIETY	35	97	80
PARTRIDGE PEA (<u>CHAMAECRISTA FASCICULATA</u>) CERTIFIED VARIETY:	10	95	90
INDIAN GRASS (<u>SORGHASTRUM NUTANS</u>) CERTIFIED VARIETY:	15	95	90
CANADA WILDRYE (<u>ELYMUS CANADENSIS</u>) CERTIFIED VARIETY:	5	95	90
KENTUCKY BLUE GRASS (<u>POA PRATENSIS</u>) CERTIFIED VARIETY:	10	95	90

Under no circumstances shall annual Ryegrass, Italian Rye, or any other seed be added to the seed mixture.

(b) The "temporary" grass seed shall be perennial ryegrass (*Lolium perenne*) or an improved variety thereof, such as Manhattan, having a minimum purity of 98% and a minimum germination of 90%.

The seed mixture shall be delivered in new, clean, sealed containers. Labels and contents shall conform to all State and Federal regulations. Seed shall be subject to the testing provisions of the Association of Official Seed Analysts.

The seed shall be delivered to the Project accompanied by a properly executed affidavit for each type and shipment of seed. The affidavit shall be of the form shown herein.

Form for Affidavit - Seed (Official Stationery of Supplier)

Date _____
To Whom It May Concern:
I hereby certify that _____ pounds of seed mixture, lot of commercial fertilizer of _____ grade. This material is designated as our number _____, (Label attached) has been sold and delivered to _____ for _____ (Contractor's Name)
Connecticut Department of Transportation Project Number(s): _____
at _____, Connecticut. The material was delivered on _____. The labels and contents meet all State and Federal regulations. The mixture consists of: (List component parts, proportions, minimum purity, minimum germination)
Signature _____ (Company Official)
Signature and Seal _____ Notary Public

The Engineer reserves the right to take such samples and to make such tests as they deem necessary to ensure compliance with these specifications. The Contractor shall supply such additional acceptable material and perform such work as required to rectify any deficiencies without cost to the State.

M.13.05—Mulch Materials:

1. Wood Chips: Wood chip mulch shall be sound, green wood, and shall be 1/8 inch nominal thickness with not less than 50% of the chips having an area of not less than 1 square inch, nor more than 6 square inches. The material shall be free from rot, leaves, twigs, shavings, debris, and any material injurious to plant growth.

2. Hay: Hay shall be from properly cured grass or legume mowings, free from weeds, reeds, twigs, debris or other objectionable material. It shall be free from rot or mold, and shall have a moisture content of not more than 15% when delivered to the Project. No salt hay shall be used.

3. Wood Fiber Mulch: Wood fiber mulch or wood cellulose fiber mulch shall be material manufactured for mulching seeded areas. The material shall be produced from clean wood, uniform in texture and free of shavings, rot and mold. Wood fiber mulch shall be commercially pre-packaged bearing the brand, name and address of the manufacturer.

4 Shredded Bark Mulch: This shall consist of the outer bark of pine or hardwood trees. The material shall be aged for a minimum of 6 months and be dark brown in color, free of chunks and pieces of wood thicker than 1/4 inch, and shall not contain, in the judgement of the Engineer, an excess of fine particles. Mulch must be free of long stringy material and dyed wood chips.

M.13.06—Compost: Compost shall be a stable, humus-like organic material produced by the aerobic, biological and biochemical decomposition of source-separated organic waste, that may include, leaves and yard trimmings, food scraps, food processing residuals, manure and/or other agricultural residuals, forest residues and bark. Compost may be either commercially packaged or from a bulk source. Compost shall not be altered by the addition of materials such as sand, soil and glass. Compost shall not contain substances toxic to plants and shall contain less than 0.1% by dry weight of man-made foreign matter. Compost shall pose no objectionable odor and shall not closely resemble the raw material from which it

was derived. Compost shall be suitable for use as a soil amendment or mulch and shall support the growth of nursery stock or seeding.. All compost material must be accompanied by a Materials Certificate and Certified Test Report in accordance with 1.06.07.

Compost shall have the following properties:

1. A minimum organic content of 50% dry weight basis as determined by loss on ignition in accordance with ASTM D2974.
2. Carbon:Nitrogen ratio range of 11:1 to 25:1.
3. Carbon:Phosphorus ratio of 120:1 to 240:1.
4. A moisture content of 35 to 60% in accordance with ASTM D2974.
5. Particle size less than 1/2 inch for Planting Backfill, and 1 inch for Erosion Control in accordance with AASHTO T27.
6. The pH of compost shall be in the range of 6 to 7.8.
7. The soluble salt content of compost shall not exceed 4.0 mmhos/cm (dS/m) as determined by using a dilution of 1 part compost to 1 part distilled water.
8. The maturity or stability of the compost shall be Stable or Very Stable, meeting either of the following criteria:
 - (a) > 6 using the Solvita Compost Maturity Test, or
 - (b) < 10°C above ambient temperature (Dewar self-heating test)
9. Maximum foreign matter 1%.

M.13.07—Plant Materials: The materials for this work shall meet the following requirements:

1. General: For the most part, the latest revised version of "Standardized Plant Names," prepared by the Editorial Committee of the American Joint Committee on Horticultural Nomenclature, shall be the authority for all botanical plant names.

All plants shall be first-class representatives of their normal species or varieties in accordance with the ANSI American Standards for Nursery Stock and as specified on the plans. They shall have well-furnished branch systems together with vigorous fibrous root systems.

Plants shall be free from all insect pests, plant diseases, disfiguring knots, stubs, sun-scalds, abrasions of the bark or any other form of injury or objectionable disfigurements. All plant material shall comply with the State and Federal laws with respect to inspection for plant diseases and insect infestations.

Plants shall not be pruned before delivery and no plants shall be cut back from larger sizes to meet the sizes specified.

Plants shall be nursery grown unless otherwise specified and bear evidence of proper nursery care, including adequate transplanting and root pruning.

No plant will be considered to be nursery grown unless it has been growing in a nursery for at least 2 years and unless it has been root pruned or transplanted no more than 5 years prior to digging.

2. Balled & Burlapped (B & B) Material: Nursery-grown trees shall meet the requirements as specified in the current edition of "U.S. American Standards for Nursery Stock," or as further specified in the plans. Nursery-grown trees shall have no cuts which are not healing, no cuts over 3/4 inch diameter which have not completely calloused over and no abrasions of the bark. They must have good fibrous root systems characteristic of the kind.

Trees shall have straight trunks, well-balanced tops and a single leader or as may be characteristic of the species.

Trees in which the leader or branches have been cut back or otherwise topped or de-horned will not be accepted. The caliper of shade trees up to and including 4 inches diameter shall be measured above the root collar (or swelling at the ground) 6 inches above ground level. Caliper shall be the determining measurement in grading. Height measurements shall be given in single feet in sizes up to and including 6 feet.

Small deciduous trees shall be completely natural. Tree "clumps" shall have 3 or more main stems starting from the ground. Bush from trees shall be those with branches which start from the main trunk close to the ground.

3. Container Grown (CG): Container grown shrubs shall possess the minimum number of stems and root mass for the height or container size specified.

Vines and groundcover plants shall be well-furnished with vigorous root systems. They shall be field-grown unless otherwise specified. Plants grown in pots or bands shall have sufficient roots to retain the soil in which they are growing when such plants are removed from their containers. Such plants shall not be root-bound.

4. Inspections: All plants shall be subject to inspection by the Engineer. The Contractor shall designate its wholesale plant material source(s) of supply to the Engineer in writing at least 1 month in advance of each planting season to facilitate an orderly and timely inspection of the items to be installed. Based on the Project schedule, material procured in the spring for fall installation must be approved before digging occurs. The Contractor shall be represented during such inspection. Inspection may be made at the nursery, on Site or via photos at the discretion of the Engineer.

All tagged samples shall be delivered to the Project for which they were sampled. All deliveries to the planting site shall be accompanied by both the vendor's invoice (designating kind, size, quantity and source(s) of supply) and Certificates of Inspection issued by Federal or State authorities or both. Such certificates shall attest to the freedom of the plant material from diseases and insect infestations. The State reserves the right to inspect all plant materials at the growing sites. Further inspections will be made when the materials are delivered to the Project site or storage area.

5. Substitutions: No change in size, kind or quality of plants from those specified will be permitted without written approval of the Engineer. The Contractor shall submit a written request for permission to make a substitution along with documentation from 3 nursery vendor source suppliers proving that the proposed plants are unavailable. Upon receipt of such request, the Engineer will suggest plants meeting the requirements of the Contract as to function, size and type and indicate the reduced cost to the State as the result of said substitution. In no case shall the price for substitutions exceed the bid price of those replaced.

6. Digging Plants: Plants shall be dug immediately before shipment unless otherwise approved. Special precaution shall be taken to avoid any unnecessary injury to or removal of fibrous roots. Damaged roots shall be cut off clean.

- (a) After deciduous bare-root plants are dug, their roots shall be protected from exposure to sun, wind and freezing temperatures. All bare roots of trees, shrubs and vines, unless otherwise directed, shall be puddled in a wet clay mixture which will cover and adhere to the entire root system. Bare roots shall be further protected by wrapping them in wet straw, moss, burlap or other suitable material, or by heeling them in and watering them in order to keep them fresh and viable.
- (b) B & B plants shall be lifted so as to retain as many fibrous roots as possible. Excess soil and feeder roots shall be removed prior to digging. All B & B plants must come from soil which will hold a firm ball. The State reserves the right to reject plants grown in excessively sandy or clayey soil if the plant is to be installed in a dissimilar soil type. The plants shall be wrapped with burlap, or similar approved material, and tightly laced with bio-degradable twine in such a manner as to hold the balls firm and intact. All B & B material arriving with broken or loose balls, or with manufactured balls, will be rejected.

7. Transportation and Labeling: Plants transported by open vehicles shall be covered by tarpaulins or other suitable covers securely tied to the body of the vehicle. Closed vehicles shall be adequately ventilated to prevent overheating of the plants. The heads of trees shall be tied in carefully to prevent breakage of the leaders and the branches. Trunks and branches shall be adequately supported on padding to prevent their being scraped or bruised.

Legible labels shall be attached to all separate plants, boxes, bundles, bales or other plant containers, indicating the name, size, and quantity of units in each container and other information necessary for inspection.

8. Delivery: Notice of delivery of plants shall be given to the Engineer by the Contractor at least 48 hours in advance of the anticipated delivery date, unless otherwise authorized. The Engineer shall be furnished a legible copy of the invoice for each shipment showing kind, sizes and quantities of materials.

All plant materials which are delivered in such a stage as to reasonably endanger their survival will not be accepted.

All plant materials shall be produced in a latitude north of Washington, D.C. and in a longitude east of the Mississippi River.

(a) **Spring Dug:** All deciduous plants shall be received with buds unopened and intact; evergreen plants with the new growth retarded.

(b) **Fall Dug:** Deciduous plants shall not be dug before the plants have hardened off.

9. Water: Water shall be free from oil, acid, alkalis, salts and any other substances harmful to plants. Water from streams shall not be used unless authorized by the Engineer.

10. Peat: Peat shall be commercially packaged peat from sedge, sphagnum or reed sources. Material shall be in such physical condition that it may be rudded through a 1/2 inch mesh screen, and may be readily mixed with soil material. It shall be free from sticks, roots, stones and other objectionable material.

It shall be delivered to the Project in clean, new, sealed containers bearing the brand, net bulk, and name and address of the packer. The material shall have an acidity that falls in the pH range of 3.0 to 7.0. It shall have a minimum organic content of 90% and a minimum water-absorbing capacity of 1000%.

11. Miscellaneous:

- (a) Anchor stakes for guying trees shall be of sound hardwood with a minimum length of 2 feet and minimum diameter of 2 inches at the smaller end. Stakes made from lumber shall measure no less than 2 inches x 2 inches throughout their lengths. Trees over 3 1/2 inch caliper shall require either stakes or dead-men for support as approved by the Engineer. The type of stake used shall be uniform throughout the Site.
- (b) Tree support posts shall be sawed posts cut to a uniform square cross-section of 2 inches x 2 inches throughout their lengths. They shall be cut from sound, hard, clean, straight wood free from crooks, 8 feet long for major trees and 4 - 5 feet long for minor trees or as approved by the Engineer.
- (c) Hose for protecting the bark of major and minor trees from guy wires shall be of good quality rubber or plastic hose acceptable to the Engineer, with a minimum inside diameter of 3/8 inch and a maximum inside diameter of 3/4 inch.
- (d) Wire shall be pliable, new, annealed, galvanized, 12-gage, for staking support and 10-gage for guying to trees. Alternate staking and guying systems shall be submitted to the Engineer for approval.
- (e) Flags shall be white cotton cloth or white plastic ribbon, 2 inches wide and 18 inches long. Gauze is not acceptable.
- (f) Anti-desiccant shall be an emulsion such as will provide a film over plant surfaces, permeable enough to permit transpiration. Anti-desiccant shall be delivered in containers of the manufacturer and shall be mixed according to the manufacturer's instructions.

M.13.08—Sod: Sod shall be living sod procured from areas where the soil is reasonably fertile and from areas similar in the degree of moisture to the area to be planted. It shall be cut or stripped, by approved methods, from turf areas relatively free of large stones, roots or other materials which might be detrimental to the sodding operation or to future maintenance. The sod shall contain a sufficient proportion of pasture grasses to ensure a good mat of roots and a reasonably dense turf unless Type No. 1, which is a superior quality, is specified on the plans.

Any growth more than 3 inches high shall be mowed to a height of 3 inches not more than 5 days before the sod is lifted.

Sources of sod shall be made known to the Engineer at least 5 days before cutting and shall be approved before mowing. The sod shall be cut into squares or rectangular portions which shall be 12 inches wide and may vary in length, but must be of a size which will permit them to be lifted without breaking. The sod shall be sufficiently moist so the soil will adhere firmly to the roots when it is handled and may require watering before lifting. Field grown sod shall be cut to a minimum depth of 1 1/2 to 2 inches. Where Type No. 1 Sod is specified, it shall be cut to a minimum depth of 1 to 1 1/2 inches.

Type No. 1 Sod shall be obtained from inspected and approved commercial sod farm sources of supply and shall be free from noxious weeds, insect infestations, and fungus and bacterial diseases.

M.13.09—Erosion Control Matting: Erosion control matting shall be from the Department's [Qualified Products List](#). Staples shall meet the Manufacturer's requirements. Material which shows signs of degradation shall not be used and shall be removed from the Project.

**SECTION M.18
SIGNING**

Replace Section M.18 in its entirety with the following:

**SECTION M.18
SIGNING**

M.18.01—Vacant

M.18.02—Anchor Bolts

M.18.03—Vacant

M.18.04—Vacant

M.18.05—Vacant

M.18.06—Vacant

M.18.07—Delineators

M.18.08—Paint for Sign Panel Overlay

M.18.09—Retroreflective Sheeting

M.18.10—Demountable Copy

M.18.11—Sign Panels-Extruded Aluminum

M.18.12—Panel Bolt Assemblies and Post Clip Assemblies

M.18.13—Sign Face—Sheet Aluminum

M.18.14—Metal Sign Posts

M.18.15—Sign Mounting Bolts

M.18.16—Data Labels

M.18.01—Vacant

M.18.02—Anchor Bolts: Anchor bolts shall meet the requirements of ASTM A449.

Leveling nuts and nuts for anchor bolt assemblies shall meet the requirements of ASTM A563, Grade DH. Leveling nuts and anchor bolt assemblies shall be hot-dip galvanized in accordance with the requirements of ASTM F2329. Leveling nuts shall be tapped oversize, after galvanizing, in accordance with ASTM A563, Section 7.5.1, and shall be provided with a lubricant in accordance with the requirements of ASTM F3125.

The Pedestal grout leveling template shall meet the requirements of ASTM A36 and shall be a minimum of 1/2 inch thick.

M.18.03—Vacant

M.18.04—Vacant

M.18.05—Vacant

M.18.06—Vacant

M.18.07—Delineators

1. Reflectors: Reflective sheeting shall meet the requirements of M.18.09 and be the type, color and shape as indicated on the plans. Backplate or sign blank material shall be an aluminum alloy of the type, shape and thickness as indicated on the plans.

2. Metal Delineator Posts:

The "Standard Metal Delineator Posts" shall be made of ASTM A36 structural steel. The posts shall be fabricated to the dimensions and weight shown on the plans. After delineator mounting holes have been established, the posts shall be galvanized in accordance with ASTM A123.

3. Bridge Rail Mounting Brackets:

The bracket shall be made of 0.125 inch Aluminum Alloy 6061-T6 fabricated to the dimensions shown on the plans and shall be fastened to the metal bridge rail with 2 each 3/8 inch diameter × 5/8 inch long cadmium plated steel box head self-tapping screws. Fasteners shall meet the requirements indicated on the plans.

M.18.08—Paint for Sign Panel Overlay: The paint to be used for the finished coat shall be an extremely durable, highest quality, semi-gloss green enamel for use on plywood and metal signs and shall be resistant to air, sun and water.

It shall consist of pigments of the required fineness and composition ground in the required vehicle by a suitable grinding machine to the required fineness. All pigments, resins, oils, thinners and driers used shall be of the best quality, free from adulterants of any kind, and shall comply with the following requirements:

Enamel Composition	Min.	Max.
Pigment, %	40	-
Vehicle, %	-	60
Volatile matter in vehicle, % by weight	-	55
Coarse particles and skins retained on No. 325 screen, based on pigment, %	-	0.5
Viscosity, Krebs units at 77°F	65	75
Weight per gallon, pounds	10.5	-
Fineness of grind (North Standard)	5	-

Pigment Composition	Min.	Max.
Chrome green, %	57	-
Extender pigment, %	-	43

The chrome green shall be Imperial A 4464 Velvet Green or approved equal.

The extender pigments shall consist of any of the following or combination thereof: magnesium silicate, barium sulfate, or diatomaceous silica. A ratio of 50% magnesium silicate and 50% diatomaceous silica has been found to produce the desired semi-gloss.

Vehicle—The vehicle shall contain not less than 45% solids by weight and shall be composed of a long oil soya modified alkyd resin solution or solutions, petroleum solvent thinners and driers. Rosin or rosin derivatives shall not be present. The alkyd resin solution or solutions shall conform to FS TT-R-266, Type I, Class A of latest issue.

Specular Gloss—The enamel shall be flowed on a tin panel and allowed to dry for 24 hours before measuring. The specular gloss at 60 degree angle of incident, ASTM D523 shall be between 35 and 45.

Setting and Drying Time—This enamel shall set to touch in less than 5 hours. It shall dry hard and tough in not more than 24 hours.

Flash Point—Not below 86°F as determined by ASTM D93.

Water Resistance—The enamel shall be flowed on a tin panel and allowed to dry for 48 hours. After being immersed for 18 hours in distilled water, it shall show no blistering or wrinkles upon removal and shall show no dulling or change in color after 2 hours recovery.

Skinning—This enamel shall not skin over within 48 hours in a 3/4 filled, closed container. Small amounts of anti-skinning agents, wetting agents, suspension agents, and anti-drier absorption agents may be added at the discretion of the manufacturer.

Working Properties—The enamel shall be well ground, shall not settle in the container, and shall be capable of being broken up with a paddle to a smooth uniform enamel of good brushing consistency, and shall have good flowing, covering and leveling properties.

M.18.09—Retroreflective Sheeting: The manufacturer and type of retroreflective sheeting materials shall be listed on the Department's Qualified Product List for the application intended.

M.18.10—Demountable Copy: The materials for this work shall meet the following:

1. Vacant
2. Type IV Retroreflective Sheeting:

Demountable cutout letters, digits, border, corner radii and copy accessories shall consist of adhesive coated retroreflective sheeting permanently adhered to flat aluminum backing. The retroreflective sheeting shall conform to M.18.09. The design of letters and accessories shall conform to FHWA Standards for use on "National System of Interstate and Defense" highways.

Aluminum backing shall be a minimum of 0.040 inch thick aluminum sheet of 3003-H14 alloy. Aluminum sheeting shall be properly treated according to sheeting manufacturer's specifications.

The demountable copy shall be fastened to the sign panel with aluminum rivets. Rivets shall be of the pull through type and of the size and number designated by the demountable copy manufacturer.

3. Non-Reflective Plastic Sheeting:

Description: Demountable cutout letters, digits, border, corner radii and copy accessories shall consist of adhesive-coated, non-reflective plastic sheeting permanently adhered to flat aluminum backing.

The material shall consist of a flexible, pigmented, plastic film completely pre-coated with a solvent or heat-activated, tack-free adhesive. The adhesive shall be protected by a treated paper liner, which shall be removable without soaking in water or other solvents. The non-reflective plastic sheeting shall conform to the following:

Property Requirements:

A. Thickness: The thickness of the plastic film with adhesive shall be a minimum of 0.003 inch and a maximum of 0.004 inch.

B. Film: The unapplied or applied film shall be readily processed with, and insure adequate adhesion of, process inks recommended by the manufacturer.

(1) Flexibility: The material shall be sufficiently flexible to permit application over and conform to moderately contoured surfaces.

(2) Gloss: The film shall have an initial 60-degree gloss value of 35 (minimum), when tested in accordance with ASTM D523, measuring at least 3 portions of the film to obtain uniformity.

C. Adhesive: The pre-coated adhesive shall form a durable bond to smooth, clean, corrosion and weather-resistant surfaces, shall be of uniform thickness, non-corrosive to applied surfaces and shall have no staining affect on the film.

D. Adhesion: The material, applied according to Paragraph J "Preparation of Test Panels" shall have sufficient bond to prevent removal from the panel in 1 piece without the aid of a physical tool.

E. Exterior Exposure: The material shall withstand 3 years' vertical, south-facing exterior exposure at a site acceptable to the Engineer, showing no appreciable discoloration, cracking, crazing, blistering, delamination, or loss of adhesion. A slight amount of chalking is permissible. The film shall not support fungus growth.

F. Dimensional Stability: The material shall show no more than 0.02 inch shrinkage in any direction from edge of the panel when prepared in accordance with Paragraph J after being subjected to a temperature of 149°F for 48 hours.

G. Heat Resistance: The material, applied according to Paragraph J, shall be heat-resistant enough to retain adhesion after 1 week at 149°F.

H. Solvent and Chemical Resistance: The material, when prepared in accordance with Paragraph J, shall withstand immersion in the following liquids at 70-90°F, showing no appreciable decrease in adhesion, color or general appearance:

Liquids	Time/Hours
Reference Fuel (MIL-F-8799A) (15 parts xylol – 85 parts mineral spirits by weight)	1
Distilled Water	24
SAE #20 Motor Oil	24

I. Opacity: When applied, the material shall be sufficiently opaque to hide a contrasting black printed legend and white surface.

J. Preparation of Test Panels: Test panels shall be prepared using a 6.5 inch × 6.5 inch piece of the plastic film, applied to a clean 6.0 inch × 6.0 inch aluminum panel, premasked or as recommended by the manufacturer, trimmed evenly at the edge of the panel, and aged for 48 hours at 70 - 90°F.

K. Shelf-Life Storage: The material shall withstand 1 year's shelf life when stored in a clean area free from exposure to excessive heat, moisture and direct sunlight.

L. General Characteristics and Packaging: The plastic film shall be furnished in rolls, cut sheets or characters, as may be specified. The film, as supplied, shall be free from ragged edges, streaks, blisters, foreign matter or other surface imperfections which would make it unsuitable for the intended usage, and shall be readily cut with scissors, knife, blade, shears or other production tools. Complete and detailed instructions for mounting the plastic film shall be supplied with each package of material.

M. Quality Assurance: For the non-reflective plastic sheeting a Certified Test Report in accordance with 1.06.07 shall be submitted.

M.18.11—Sign Panels-Extruded Aluminum: Sign panels (extruded aluminum) shall be of the butt type, alloy 6063-T6 ASTM B221. Several extruded sections shall be joined with panel nuts, bolts, and washers to achieve the desired sign size. The extruded aluminum panels shall be of 6 inch and 12 inch heights to achieve sign panel vertical dimensions in increments of 6 inches; however, no more than one 6 inch panel shall be used on any sign. The weight and section properties of the 6 inch and 12 inch extruded panels shall be as indicated on the plans.

On the vertical axis (the 6 inch or 12 inch dimension), the panel face shall be in the same plane within 0.015 inch in any 6 inches. Extruded sections shall be mounted horizontally, and the panel faces shall be flush after the erection of the sign is complete.

Cleaning: Extruded aluminum sign panels shall be thoroughly cleaned and degreased by total immersion in an alkaline solution which is controlled and titrated to the solution manufacturer's recommendations. Immersion time shall be sufficient to completely remove all grease, dirt or other contaminants. After cleaning, the panels shall be thoroughly rinsed with clear running water.

Pretreatment: Sign panels shall be treated with a light, tightly adherent chromate conversion coating, free of any powdery residue, ranging in color from a silvery iridescent to a pale yellow, conforming with ASTM B449, Class 2, 10-35 mg/s.f., with 25 mg/s.f. as the optimum coating weight.

M.18.12—Panel Bolt Assemblies and Post Clip Assemblies:

Panel Bolt Assembly: Aluminum hex head bolt, hex nut and washer shall be as shown on the plans and shall be used to unite several panels sections to conform to the designed sign size. Nuts shall be drawn tight. Bolt holes may be drilled or blanked to finished size.

Thread fit for bolts shall conform to class 2-A fit of American Standard Association.

Post Clip Assembly: Aluminum post clips square head bolt, lock nut and washer shall be as shown on the plans.

The shank of the post clip bolts shall fit tightly against the sign support flange after nuts have been tightened. The clip bolts shall be torqued to 20 ft-lb. when using dry, clean, unlubricated threads.

M.18.13—Sign Face—Sheet Aluminum: Sheet aluminum sign blanks shall be constructed of sheet aluminum, alloy 6061 T6 or alloy 5052 H38. Sheet aluminum sign blanks shall meet the requirements of ASTM B209. They shall be degreased and etched in accordance with the recommendations of the sheeting manufacturer or treated with a light, tightly adherent chromate conversion coating, free of any powdery residue, ranging in color from silvery iridescent to a pale yellow, meeting the requirements of ASTM B449, Class 2 10-35 mg/s.f. with 25 mg/s.f. as the optimum coating. The thickness shall be as specified on the plans.

M.18.14—Metal Sign Posts: Metal sign posts, square tubular supports and parapet-mounted sign supports shall conform to the requirements as noted on the plans. The size, shape and mass of posts and supports shall be as specified in the plans.

After fabrication of the posts and supports, including hole punching or drilling, they shall be galvanized in accordance with ASTM A123 unless otherwise noted on the plans.

M.18.15—Sign-Mounting Bolts: Bolts used for sign-mounting shall be stainless steel and meet the requirements of ASTM F593, Group 1 or 2 (Alloy Types 304 or 316). Locking nuts shall be stainless steel and shall meet the requirements of ASTM F594, Group 1 or 2 (Alloy Types 304 or 316). Washers shall also be stainless steel and shall meet the requirements of ASTM A240 (Alloy Types 304 or 316).

M.18.16—Data Labels: Data Labels shall be 2 separate 5 inch × 3 inch, non-reflective weatherproof films with black legend on a yellow background having a pressure-sensitive adhesive backing.

A "Fabrication" data label must include information about the sign fabricator, date of fabrication and the sheeting manufacture type. An "Installation" data label must include the State Project Number or Maintenance Permit Number that installed the sign, and date of installation.

All legend ink must be durable and not fade, discolor, or smudge. All variable legends to be included at label fabrication. Only one installed by permit number or project number should be provided.

If the sign was fabricated or installed by state forces, insert "State."

The pre-coated pressure-sensitive adhesive, covered by a removable liner, must be removable at application without soaking in water or other solvents.

The adhesive must form a durable bond to surfaces that are smooth, clean, corrosion free and weather resistant.

CONN DOT SIGN FACE DATA LABEL											
Fabricator: (Insert NAME or State) Sheeting Manufacturer - Type (Insert NAME - TYPE)											
Date Fabricated - Month / Year											
J	F	M	A	M	J	J	A	S	O	N	D
12	13	14	15	16	17	18	19	20	21	22	23

CONN DOT SIGN FACE DATA LABEL											
Installed By: Project No.: (Insert 000-000 or State) Permit No.: (Insert D_-000000)											
Date Installed - Month / Year											
J	F	M	A	M	J	J	A	S	O	N	D
12	13	14	15	16	17	18	19	20	21	22	23

Completed Data Labels must not discolor, crack, craze, blister, delaminate, peel, chalk, or lose adhesion when subjected to temperatures from -30° to 200°F.