# **VERMONT AGENCY OF TRANSPORTATION**

# MATERIALS SAMPLING MANUAL



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#### **INTRODUCTION**

This manual has been prepared by the Agency's Materials Testing and Certification Section to familiarize the reader with the Agency's adopted practices for accepting materials. The Materials Sampling Manual (MSM) includes tiered testing requirements based on acceptable levels of risk and service identified for each level. The material and sampling requirements are different for each level. These requirements are outlined in level-specific materials sampling and testing frequency tables presented later in this document.

Projects are assigned to a particular level based on the factors outlined in Section 4 of the Agency's Quality Assurance Program (QAP). For the purposes of this manual, the terms Resident Engineer and District Transportation Administrator will be synonymous for projects under the respective authority of each. The Resident Engineer is responsible for ensuring that their project's material acceptance requirements are met based on the material sampling and testing frequency tables (Tables 1, 2, and 3) and the Pay Item and Certification Quick Reference (Appendix A).

The Resident Engineer's decision regarding the acceptability of a material for a project will require consideration of the following; material certifications, visual inspections, and material test results. In addition, the status of a given product, material, material source, material producer, or contractor on a pre-approval list (such as products listed on the Agency's Approved Products List, or contractors on the Umbrella Certification Program) will also require consideration in the Acceptance decision.

It is the responsibility of the Resident Engineer to inform the Materials Testing and Certifications Section of any change in design or authorization for material specification changes.

For the purposes of this document the definitions of the QAP apply, see Section 3.0 of the QAP. The QAP and other Agency documents referenced within this text are available on the Agency website; <u>http://vtrans.vermont.gov/highway/construct-material</u>.

#### **CERTIFICATION TO FHWA**

Upon final acceptance of any Federal-aid highway projects, the Materials and Certifications Manager is responsible for preparing, on behalf of the Vermont Secretary of Transportation, a report that states: "The results of the tests used in the acceptance program indicate that the materials incorporated in the construction work, and the construction operations controlled by sampling and testing, were in conformity with the approved plans and specifications." Any exceptions to the contract provisions must be noted and explained. Requirements and regulatory information are contained in Title 23 Code of Federal Regulations (23CFR), Part 637, Subpart B.

It is the responsibility of the Resident Engineer to provide an explanation for any materials permanently incorporated into the work that are not in conformance with the contract provisions. Explanations must include the material involved, quantity involved, reason for nonconformance with specifications, and state why the material was incorporated into the project.

## **APPROVED SOURCE LISTS**

Some materials are required to be obtained from suppliers or producers that have previously demonstrated conformance with the Agency's Quality Assurance Program and specification requirements. These approved source lists are maintained by the Materials Testing and Certification section and are discussed below.

## 1. APPROVED AGGREGATE SOURCE LIST

The 'Approved Aggregate Source List' is a tool used to determine which aggregate production facilities have been deemed Acceptable for use on Agency projects. The list includes aggregates produced for unbound, Portland cement concrete, and bituminous concrete applications. The 'Approved Aggregate Source List', applicable forms, and detailed information regarding its use, can be found on the Geotechnical Engineering section website.

# 2. APPROVED CEMENTITIOUS SOURCE LIST

The 'Approved Cementitious Source List' is a tool used to determine which cementitious production facilities and cementitious materials have been Approved for use on Agency projects. The list is populated with cementitious materials that have successfully completed annual evaluation and demonstrated conformance with the applicable specifications. The 'Approved Cementitious Source List', applicable forms, and detailed information regarding its use, can be found on the Materials Testing and Certification website.

# 3. APPROVED CONCRETE PRODUCER LIST

The 'Approved Concrete Producer List' is a tool used to determine which ready-mix concrete and precast concrete production facilities have been approved for use on Agency projects. The list is populated with facilities that have undergone annual inspection and satisfied the requirements of the Qualified Laboratory Program and applicable specifications for the materials being produced. The 'Approved Concrete Producer List', applicable forms, and detailed information regarding its use, can be found on the Materials Testing and Certification website.

#### 4. APPROVED BITUMINOUS CONCRETE PRODUCER LIST

The 'Approved Bituminous Concrete Producer List' is a tool used to determine which bituminous concrete production facilities have been approved for use on Agency projects. The list is populated with facilities that have undergone annual inspection and satisfied the requirements of the Qualified Laboratory Program and applicable specifications for the materials being produced. The 'Approved Bituminous Concrete Producer List', applicable forms, and detailed information regarding its use, can be found on the Materials Testing and Certification website.

# 5. APPROVED PERFORMANCE-GRADED BINDER PRODUCER LIST

The 'Approved Performance-Graded Binder Producer List' is a list of performance-graded binder production facilities that have been Approved for use on Agency projects. The list is populated with suppliers and grades that have successfully completed annual evaluation and demonstrated conformance with the applicable specifications. The 'Approved Performance-Graded Binder Producer List', applicable forms, and detailed information regarding its use, can be found on the Materials Testing and Certification website.

# 6. UMBRELLA CERTIFICATION PROGRAM (UCP)

The 'Umbrella Certification Program' is a list of companies that have become an approved supplier for specific materials as defined by the Agency. The UCP is not intended to replace, but rather work in conjunction with, other methods employed by VTrans to certify materials. The 'Umbrella Certification Program', applicable forms, and detailed information regarding its use, can be found on the Materials Testing and Certification website.

### MATERIAL ACCEPTANCE

As discussed in the introduction, there are several methods of material acceptance employed by the Agency. Each of these material acceptance tools maintained by the Materials Testing and Certification section are discussed below, including how to determine for which pay items each are to be applied, and where to find the necessary information and forms.

#### 1. MATERIAL SAMPLING AND TESTING

The minimum material sampling frequency for materials designated for testing is listed in the levelspecific 'Material Sampling and Testing Frequency Tables' (Table 1, 2, and 3) below.

VTrans' Material specifications reference material standards and test methods published by the American Association of State Highway and Transportation Officials (AASHTO) and the American Society for Testing and Materials (ASTM). The proper sampling and testing of materials being incorporated into Agency projects is required to determine whether or not the materials' properties conform to the Agency's contract requirements.

Each sample must be representative of the material used. Random samples are required whenever feasible. The Resident Engineer is responsible for maintaining a summary of quantities so that the total amount of sampled material represents the final project quantity for any given item. Personnel from the Agency's Central Laboratory located in Berlin, VT, are available to assist other Agency personnel with any questions or concerns regarding procedures for sampling or processing of samples. Contact information for these staff is available on the Agency website.

The minimum sample size is determined by the tests to be performed. The sample size listed should be large enough to accommodate re-testing, if required. Not all samples are transported to the Agency's Central Laboratory; some materials are transported to the Agency's Regional Laboratories. Resident Engineers are responsible for the timely delivery of applicable samples to the Central Laboratory.

Sample identification tags and cards will be provided by the Materials Testing and Certifications section. Sample tags and cards should be completed **with all the indicated information** and attached to the sample container immediately after the sample is taken. Sample tags and cards should be attached in a manner which will prevent their loss or damage during handling and transport. Examples of properly filled out sample cards for commonly sampled materials are included later in this document. As an alternative, Sitemanager labels can be printed and affixed to the sample in lieu of the sample tag.

When samples consist of more than one container, each container will have an attached sample tag. With the advent of the Site Manager software program it is increasingly important for the Resident Engineer to include the Site Manager line item on the sample tag or card. If this information is not included

in the sample identification, it could lead to material testing and reporting delays. If there is not a designated location on the sample card or tag itself for this information, then the Resident Engineer shall make sure that it is documented in the upper right hand corner on the front face of the sample card or tag.

## 2. MINOR QUANTITIES

For pay items that are designated as requiring sampling and testing, every effort should be made to acquire at least one sample during the time of construction. Circumstances in the construction operation, the quantity of the item used, and the application in which a material is used are important considerations before any quantity should be considered as minor.

The minor quantity threshold is defined for each pay item in the sampling and testing frequency tables presented below (Table 1 and Table 2). These quantity thresholds are based on total project quantity for a given pay item, not the quantity being placed at one time. Materials which meet the criteria for minor quantities shall be from known, reliable sources, perform satisfactorily, and meet the requirements for the purpose intended.

Minor quantities of materials may be accepted without sampling and testing, except as noted below. The acceptance of a minor quantity is the sole responsibility of the Resident Engineer. The Resident Engineer must provide written documentation on the "Minor Quantity Declaration Form". This form shall be submitted to the Materials Acceptance Unit as the basis for declaring a quantity a "minor quantity", prior to incorporating the material into the project.

If plant inspection/testing personnel are not available for small project quantities the following condition applies:

1) The Resident Engineer may waive plant inspection/testing requirements for Hot Mix Asphalt (HMA) from approved HMA plants with the exception that box samples (as appropriate to the material) are obtained and transported to the Central Laboratory for further evaluation. In these instances, testing of P.G. Binder may also be waived.

#### 3. APPROVED NON-DURABLE PAVEMENT MARKING BATCH LIST (ANDPMBL)

The 'Approved Non-Durable Pavement Marking Batch List' is a tool used to accept certain types of pavement marking by documenting the use of paint batches that have been previously tested and approved by the Agency. The materials for which this acceptance tool may be applied are listed in the Pay Item and Certification Quick Reference (Appendix A). The 'ANDPMBL' list, applicable forms, and detailed information regarding its use, can be found on the Materials Testing and Certification website.

#### 4. APPROVED PRODUCTS LIST (APL)

The 'Approved Products List' is a tool used to determine which products have been Approved for use on Agency projects. The materials for which this acceptance tool may be applied are listed in the Pay Item and Certification Quick Reference (Appendix A). The 'Approved Products List', applicable forms, and detailed information regarding its use, can be found on the Materials Testing and Certification website.

# 5. MATERIAL CERTIFICATION

A list of materials requiring certification, and certification forms for a given project, will be produced and made available by the Materials Acceptance Unit for each new project.

It is the responsibility of the Resident Engineer to ensure that the appropriate certifications are obtained by the Contractor and submitted to the Materials Acceptance Unit for audit **prior** to incorporating the materials into the project. See the Pay Item and Certification Quick Reference (Appendix A) for the list of pay items and materials requiring certification. It shall be the responsibility of the Resident Engineer to verify that the material certification represents the materials incorporated into the project. No payment shall be made on materials requiring certification until such material certifications have been audited and approved.

At the Engineer's discretion, testing of any material for which a certification is required may be performed either at the point of manufacture or after delivery to the site of the work. In such cases, the results of the tests shall govern the acceptance or rejection of the material tested.

When Agency approval is given for Working Drawings under the requirements of Section 105 and the referenced drawings or project Special Provisions have identified a component of an item by a specific product name and/or number, the Engineer may waive all or part of any certification or testing requirements for that particular product.

For permanently incorporated steel and iron materials, the following requirements shall apply:

- (1) To comply with Buy America provisions, a manufacturer must certify that all manufacturing processes, including any coating application, occurred in the United States. Coating includes all processes which protect or enhance the value of the material to which the coating is applied.
- (2) To identify a chain-of-custody documentation trail that identifies the product as one that meets the Buy America provisions, each supplier or fabricator involved in the manufacturing processes of a product will be required to include in their certification a statement that each process performed by them which alters the physical form or shape or changes its chemical composition was entirely performed in the United States.
- (3) Allowable exceptions to the Buy America provisions may include the following conditions:
  - a. The amount of steel or iron materials do not meet the minimum threshold of \$2,500.00 (the total amount of iron or steel products as delivered to the project) or 0.1% of the total contract amount, whichever is greater.
  - b. Buy America waivers are granted by FHWA on a project-by-project basis if the application of Buy America provision would be inconsistent with the public interest, or steel and iron materials/products are not produced in the United States in sufficient and reasonably available quantities which are of a satisfactory quality. If requesting a Buy America waiver, account for a significant lead-time.

Types of Certifications. Unless otherwise specified, certifications shall be prepared by the manufacturer for products delivered to the project and shall be one of the following types:

- (1) <u>Type A</u>. A Type A Certification shall certify that the component materials and finished products have been tested by means identified in the Manufacturer's Quality Controls and the results conform to all requirements of the Agency, the State, pertinent Plans, Special Provisions, and Specifications for the Contract Item.
- (2) <u>Type D</u>. A Type D Certification shall consist of a Type A Certification accompanied by a Certificate of Analysis (C of A) showing actual chemical and physical analysis of material used in the manufacture of products and a Certificate of Compliance (C of C) demonstrating that the properties of the finished product meet applicable specifications.

Advance Certification List (ACL). Manufacturers of materials requiring a Type A Certification may submit their certifications annually at the beginning of each calendar year and, if approved, their products will be included on a list of materials with advance certification. Materials that are included on the Advance Certification List will not require separate certification for each project. The Agency reserves the right to remove any manufactured product from the Advance Certification List at any time.

All project related certification documents to be audited by the Materials Acceptance Unit shall be submitted through DocExpress.

Small Quantity Certification Waiver (SQCW). At the discretion of the Engineer, certification requirements may be waived for materials with small quantities, if the material is not directly associated with the safety of a structure or roadway. A small quantity is a quantity where the total quantity of a material installed on a project has a value of \$5,000 or less. Materials where a SQCW has been submitted must still meet or exceed the specified material requirements.

# SAMPLING METHODS

- 1. Random or stratified random sampling is defined as a sampling procedure whereby any sample in a sublot has an equal probability of being selected. The method of obtaining a random sample is specified in ASTM D 3665.
- 2. Selective sampling is a non-random procedure where a sample is obtained for informational purposes
- 3. A split sample is a single material sample that has been divided into two or more portions.
- 4. Replicate samples are two or more material samples taken at the same location and time.

# **TYPES OF SAMPLES**

Sampling and testing is classified as one of five different types:

1. Acceptance (random or stratified random)

- 2. Quality Control, including process control (random or selective)
- 3. Independent assurance (split, replicate)
- 4. Investigative (selective)
- 5. Verification (split, replicate or selective)

# 1. ACCEPTANCE SAMPLING AND TESTING

Acceptance sampling and testing is defined as sampling, testing, and the assessment of test results to determine if the materials and workmanship represented by those test results are in conformity with the requirements of the approved plans and specifications. The Resident Engineer is responsible for making the acceptance decision by determining if the material and workmanship being incorporated into the project are in conformity with the approved plans and specifications.

It is the intent of 23 CFR 637.205 (e) that all acceptance sampling performed on Federal-Aid Highway projects shall be obtained randomly. The Agency recognizes that there may be practical limitations to achieving this goal. Therefore, the Agency will employ practical measures to assure adequate numbers of samples are taken.

Acceptance samples will be obtained and tested by qualified Agency personnel or representatives. Laboratories where acceptance testing is performed must be a qualified laboratory as outlined in the Agency's Qualified Laboratory Program. A list of Qualified Laboratories will be made available on the Agency website. The requirements for personnel and laboratory qualifications are defined in the Agency's Quality Assurance Program (QAP), Qualified Laboratory Program (QLP), and Qualified Technician Program (QTP) and are available on the Agency website.

Re-sampling is warranted only if it is determined by the Agency that the original sample was not representative of the material being incorporated into the work.

Re-testing is warranted only if it is determined by the Agency that the test results were not obtained in accordance with the requirements of the QAP.

Proper sampling and testing procedures are outlined in the material sampling frequency tables (Tables 1, 2, and 3).

# 2. QUALITY CONTROL SAMPLING AND TESTING

Quality control, including process control, sampling and testing is defined as sampling and testing performed by the *Contractor*, *Producer*, or *Manufacturer* in the manufacturing, production, transport and placement of materials to ensure the materials and workmanship incorporated into the project are in conformity with the requirements of the approved plans and specifications. Acceptance sampling and testing shall not be used for process or quality control purposes.

Quality control sample test results shall not be used as the sole basis for making the acceptance decision.

# 3. INDEPENDENT ASSURANCE SAMPLES

Independent Assurance (IA) sampling and testing is defined as system-based sampling and testing that is conducted by the Independent Assurance (IA) Unit to provide an unbiased and independent

evaluation of the qualified sampling and testing personnel and the testing equipment used in the Acceptance program.

IA comparison samples shall be split or replicate samples obtained by IA technicians who have no direct responsibility for the acceptance samples or test results being compared.

Independent Assurance sample test results shall not be evaluated as part of the acceptance decision.

# 4. INVESTIGATIVE SAMPLES

Investigative samples are selective samples obtained by qualified Agency personnel or representatives. These samples are typically obtained for research purposes, forensic purposes, or for other investigative or informational purposes.

Investigative sample test results shall not be evaluated as part of the acceptance decision.

# 5. VERIFICATION SAMPLES

Verification samples are non-random field samples which, in the opinion of the sampler, represent the quality of the material or an item of construction.

Verification sampling and testing is performed by the Agency to verify the quality of the material or veracity of the *material certification*, and may be evaluated as part of the acceptance decision.

#### MATERIAL SAMPLING FREQUENCY TABLES

As explained in the introduction, this manual has been prepared by the Agency's Materials Testing and Certifications section to familiarize the reader with the Agency's adopted practices for sampling, testing, and independently comparing materials that may be incorporated into Agency projects. The Materials Sampling Manual (MSM) includes tiered testing requirements that coincide with the Quality Assurance Program project inspection levels as detailed in Section 4.0 of the Quality Assurance Program document. Sampling requirements for a given material may be different for each Quality Assurance Program project inspection level, in order to reflect the potential risk associated with each of these project inspection levels.

The Resident Engineer is responsible for ensuring that their project's sampling and testing requirements are met based on the material sampling and testing frequency tables. Minimum sampling requirements for acceptance are given in the material sampling frequency tables presented below. The sampling frequency for a given material is intended to give general guidance but may be increased for specific project needs. Sampling frequency should be increased whenever there is uncertainty regarding the quality of the material or workmanship.

It is to be interpreted in the following tables (Table 1, 2, and 3) that all sampling frequencies indicated are applicable <u>per project.</u> For example, '1/400 CY' should be interpreted to mean '1/400 CY/project'.

				Table 1: Material Sam	pling Manual Project I	Levels 1 & 2				
Ľ						es ce				Procedures
ctio	ber	G	e cati		⋧	ence ::	de la	(2)		
stru	m	Jam	am		antii	e bt	a n n	Ð	_	Ę
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Гуре	Ба	۵.	late A		2	Ainii	CCC	S		F
·			2			2 **	4			
	203.30	Earth Borrow	703.02 Earth Borrow	Moisture-Density Moisture	< 300 CY	1/Soil type 1/2000 CY	Stockpile In place	50	R 90	T 99 T 255 or T 310
	203.30	Earth Bollow	703.02 Earth Borrow	Density	< 300 CY < 300 CY	1/2000 CY	In place	2		T 191 or T 310
				Gradation	< 300 CY	1/3000 CY	In place	22	R 90	T 27, T 11
/				Moisture-Density		1/10,000 CY/Source	Stockpile	50	R 90	Т 99
lts	203.31	Sand Borrow	703.03 Sand Borrow and Cushion	Moisture	< 300 CY	1/2000 CY	In place	20		T 255 or T 310
nei				Density	< 300 CY	1/2000 CY	In place			T 191 or T 310
anki				Gradation	< 300 CY	1/3000 CY	In place	22	R 90	T 27, T 11
nba	203.32	Granular Borrow	703.04 Granular Borrow	Moisture-Density		1/10,000 CY/Source	Stockpile	50	R 90	T 99
ш				Moisture	< 300 CY	1/2000 CY	In place	2		T 255 or T 310
				Density	< 300 CY	1/2000 CY	In place			T 191 or T 310
/				Gradation Moisture-Density	< 300 CY	1/5000 CY 1/10,000 CY/Source	In place Stockpile	See note 2 50	R 90 R 90	T 27, T 11 T 99
/	203.35	Gravel Backfill for Slope Stabilization	704.07 Gravel Backfill for Slope Stabilization	Moisture	< 300 CY	1/5000 CY	In place	20	11.90	T 255 or T 310
/				Density	< 300 CY	1/5000 CY	In place	20		T 191 or T 310
C SS				Gradation	< 300 CY	1/3000 CY	In place	See note 2	R 90	T 27, T 11
tior tur <sub>€</sub>				Moisture-Density		1/10,000 CY/Source	Stockpile	250	R 90	T 99
ava ruc:	204.30	Granular Backfill for Structures	704.08 Granular Backfill for Structures	Moisture	< 300 CY	1/500 CY	In place	30		T 255 or T 310
St St				Density	< 300 CY	1/500 CY	In place		L	T 191 or T 310
б п			704.05B Crushed Gravel for Subbase, Fine Graded	Gradation	< 300 CY	1/3000 CY	In place	See note 2	R 90	T 27, T 11
				Gradation	< 300 CY	1/3000 CY	Stockpile on project	See note 2	R 90	T 27, T 11
	301.15	Subbase of Gravel	704.04 Gravel for Subbase	Moisture-Density		1/10,000 CY/Source <sup>12</sup>	Stockpile	250	R 90	T 180
	001110			Moisture	< 300 CY	1/2000 CY	In place			T 310
				Density	< 300 CY	1/2000 CY				T 310
/				Gradation Moisture-Density	< 300 CY/650 TONS	1/3000 CY/6500 TONS	Stockpile on project	See note 2	R 90	T 27, T 11
/	301.25	Subbase of Crushed Gravel, Coarse Graded	704.05A Crushed Gravel for Subbase, Coarse Graded	Moisture	< 300 CY/650 TONS	1/10,000 CY/Source <sup>12</sup> 1/1000 CY/2150 TONS	Stockpile In place	250	R 90	T 180 T 310
e				Density	< 300 CY/650 TONS	1/1000 CY/2150 TONS	In place			T 310
bas				Gradation	< 300 CY/650 TONS	1/3000 CY/6500 TONS	Stockpile on project	See note 2	R 90	T 27, T 11
gng	301.26	• · · · · · · · • · · · · · · · · · · ·		Moisture-Density		1/10,000 CY/Source <sup>12</sup>	Stockpile	250	R 90	T 180
0)	301.28	Subbase of Crushed Gravel, Fine Graded	704.05B Crushed Gravel for Subbase, Fine Graded	Moisture	< 300 CY/650 TONS	1/1000 CY/2150 TONS	In place			T 310
/				Density	< 300 CY/650 TONS	1/1000 CY/2150 TONS	In place			T 310
/				Gradation	< 300 CY	1/3000 CY	Stockpile on project	See note 2	R 90	T 27, T 11
/	301.35	Subbase of Dense Graded Crushed Stone	704.06 Dense Graded Crushed Stone for Subbase	Moisture-Density		1/10,000 CY/Source <sup>12</sup>	Stockpile	250	R 90	T 180
/	001.00	Subbase of Dense Graded Grashed Glone		Moisture	< 300 CY	1/1000 CY	In place			T 310
				Density	< 300 CY	1/1000 CY	In place			T 310
	301.40	Subbase, RAP	301.02 Subbase, RAP	Gradation	< 500 TONS	1/2000 TONS	In place	See note 2	R 90	T 27, T 11
~			Declaimed Dece (2011)	Gradation		1/2500 sy for first 10,000 sy 1/10,000 sy thereafter	In place	165	R 90	T 27
SB	310.20	Full Depth Reclamation (FDR)	310.02 Reclaimed Base (2011) Full Depth Reclamation (2018)	Moisture-Density Moisture		1/10,000 CY/Source <sup>12</sup> 1/4000 sy for first 10,000 sy 1/10,000 sy thereafter	Stockpile In place	50	R 90	T 180 T 310
щ				Density		1/4000 sy for first 10,000 sy 1/10,000 sy thereafter	In place			T 310 T 310
ė				Gradation	< 300 CY	1/5000 CY	In place	100	R 90	T 27, T 11
ate ours			704.12 Aggregate for Surface Course and Shoulders			1/10,000 CY/Source	Stockpile	50	R 90	T 180
ega Co	401.10	Aggregate Surface Course	(2011) Aggregate for Surface Course and Shoulders	Moisture	< 300 CY	1/5000 CY	In place			T 255 or T 310
ggr ace	-01.10	Aggregate Garrage Gourse	(04.12) (a) Aggregate Surface Course (2010)	IVIOISUI E	> JUU U I					1 200 01 1 310
, A			(2018) Aggregate Surface Course (2018)	Density	< 300 CY	1/5000 CY	In place			T 191 or T 310
S			704.40	-			·		<del> </del>	-
/			704.12 (2011) Aggregate for Surface Course and Shoulders							
/	402.12	Aggregate Shoulders	(2011) (2011) 704 12 (b) (2011)	Gradation	< 300 CY	1/5000 CY	In place	100	R 90	T 27, T 11
S			704.12 (b) Aggregate for Shoulders (2018)							
Ilde									{	
hot			402.02							
ດ ບ	402.13	Aggregate Shoulders, RAP	(2011) 704.12 (b) Aggregate for Shoulders (2018)	Gradation	< 300 CY	1/5000 CY	In place	100	R 90	T 27, T 11
gatı		-	(2018)				·			
jre(									4	
Ag										
- /	403.12	Aggregate Shoulders, RAP with RAS (2018)	704.12 (b) (2018) Aggregate for Shoulders (2018)	Gradation	< 300 CY	1/5000 CY	In place	100	R 90	T 27, T 11
L		, ggregate chouldors, this with the (2010)	(2018) (2018)		- 000 01	1/0000 01		100	1,00	· <i>L</i> , / //
Π	415.20	Cold Mixed Recycled Bituminous Pavement	415.02 Cold Mixed Recycled Bituminous Pavement	Density		1/2000ft/lane/lift	In place			T 310 or ASTM D7830
-Place cycling		Cold Mixed Recycled Bituminous Pavement Emulsified Asphalt, Cold Mixed	<ul><li>415.02 Cold Mixed Recycled Bituminous Pavement</li><li>415.02 Emulsified Asphalt</li></ul>	Density Distillation, Penetration @ 25 °C	< 40 CWT	1/2000ft/lane/lift 1/day/production lot	In place	1 Quart	R66	T 310 or ASTM D7830 T 49, T 59

					Table 1: Material Samplin	ng Manual Projec	t Levels 1 & 2				
no	<u>_</u>		tion				cy ce				Procedures
Type of Construction	Pay Item Numbe	Pay Item Name	Materials Specificat Number	Material Name	Test	Minor Quantity Threshold	Minimum Acceptan Sampling Frequen <b>(per project)</b>	Acceptance Sampli Location	Sample Size <sup>(2)</sup>	Sampling	Testing <sup>(1)</sup>
Treatment Materials	404.65	Emulsified Asphalt	702.04	Emulsified Asphalt	Distillation, Penetration @ 25 °C	< 40 CWT	1/ 200 CWT	Distibutor Truck on Project	1 Quart	R 66	T 49, T 59
					Slip AC Content	< 100 TONS	1/500 TONS for first 1,000 TONS, 1/1,000 TONS thereafter	Truck Batch Slip			Truck Slip Calculation
					Gradation	< 100 TONS	1/500 TONS for first 1,000 TONS, 1/1,000 TONS thereafter	Truck @ Plant or on Project <sup>11</sup>	Dependent on mix type <sup>9</sup>	R 97	T 308, T 30
					Air voids, VMA Mixing Temperature	< 100 TONS < 100 TONS	1/500 TONS for first 1,000 TONS, 1/1,000 TONS 1/500 TONS for first 1,000 TONS, 1/1,000 TONS thereafter	<u>Truck @ Plant or on Project<sup>11</sup></u> Truck @ Plant or on Project <sup>11</sup>	 	<u>R 97</u>	T 166, T 209, T 269, PP 19
4	406.25	Marshall Bituminous Concrete Pavement (Method Spec)	406.03	Bituminous Concrete Pavement	Density-mat		Project less than 0.5 miles take 4 cores per day production. Project greater than 0.5 miles, 1 core per .5 miles, minimum of 6 cores per day.	In place	6" ID Core	R 67	T 166
		Medium Duty Marshall Bituminous Concrete			Density-joint		See specifications	In place	6" ID core	R 67	T 166
otance)		Pavement (Method Spec)			Surface Tolerance		Project less than .5 miles, use straightedge only Project greater than .5 miles, use Road Surface Profiler 1/project, Wearing Surface only	In place	N/A		328 or Straight Edge
Spec Accep		-	702.02	Performance-Graded Asphalt Binder	Unit weight, Flashpoint, Rotational Viscosity, DSR - Original, Effect of heating mass, DSR - RTFO, DSR - PAV, Creep stiffness, m Value	< 200 TONS of Mix	1/1,500 TONS of Mix <sup>13</sup>	In-line @ plant	2 Quarts	R 66	T 48, T 228, T 240, T 313, T 315, T 316
thod			702.04	Emulsified Asphalt	Distillation, Penetration @ 25 °C	< 40 CWT	1/ 200 CWT	Distibutor Truck on Project	1 Quart	R 66	T 49, T 59
(Me					Slip AC Content	< 100 TONS	1/500 TONS for first 1,000 TONS, 1/1,000 TONS thereafter	Truck Batch Slip			Truck Slip Calculation
oulders					Gradation	< 100 TONS	1/500 TONS for first 1,000 TONS, 1/1,000 TONS thereafter	Truck @ Plant or on Project <sup>11</sup>	Dependent on mix	R 97	Т 308, Т 30
and She					Air voids, VMA	< 100 TONS	1/500 TONS for first 1,000 TONS, 1/1,000 TONS thereafter 1/500 TONS for first 1,000 TONS, 1/1,000 TONS	Truck @ Plant or on Project <sup>11</sup>	type <sup>9</sup>	R 97	T 312,T 166,T 209,T 269, R 35
gui			490.03	Superpave Bituminous Concrete Pavement	Mixing Temperature	< 100 TONS	thereafter	Truck @ Plant or on Project <sup>11</sup>			
e (	490.30 (2011) 406.35	Superpave Bituminous Concrete Pavement (Method Spec) (2011) Superpave Bituminous Concrete Pavement			Density-mat		Project less than 0.5 miles take 4 cores per day production. Project greater than 0.5 miles, 1 core per .5 miles, minimum of 6 cores per day.	In place	6" ID core	R 67	T 166
liai	406.36	(Method Spec) Superpave Bituminous Concrete Pavement, Type			Density-joint		See specifications	In-place	6" ID core	R 67	T 166
ement [	(2018)	IVB (Method Spec) (2018)			Surface Tolerance		Project less than .5 miles, use straightedge only Project greater than .5 miles, use Road Surface Profiler 1/project, Wearing Surface only	In place	N/A		328 or Straight Edge
oncrete Pav			702.02	Performance-Graded Asphalt Binder	Unit weight, Flashpoint, Rotational Viscosity, DSR - Original, Effect of heating mass, DSR - RTFO, DSR - PAV, Creep stiffness, m Value	< 200 TONS of Mix	1/1,500 TONS of Mix <sup>13</sup>	In-line @ plant	2 Quarts	R 66	T 48, T 228, T 240, T 313, T 315, T 316
nous C			702.04	Emulsified Asphalt	Distillation, Penetration @ 25 °C	< 40 CWT	1/ 200 CWT	Distibutor Truck on Project	1 Quart	R 66	T 49, T 59
Bitumir					Slip AC Content	< 100 TONS	1/500 TONS	Truck Batch Slip			Truck Slip Calculation
_			407.03	Bonded Wearing Course	Gradation	< 100 TONS	1/500 TONS	Truck @ Plant or on Project <sup>11</sup>	Dependent on mix type <sup>9</sup>	R 97	Т 308, Т 30
4	407.15	Bonded Wearing Course			Mixing Temperature	< 100 TONS	1/500 TONS	Truck @ Plant or on Project <sup>11</sup>			
			702.02	Performance-Graded Asphalt Binder	Unit weight, Flashpoint, Rotational Viscosity, DSR - Original, Effect of heating mass, DSR - RTFO, DSR - PAV, Creep stiffness, m Value	< 200 TONS of Mix	1/1,500 TONS of Mix <sup>13</sup>	In-line @ plant	2 Quarts	R 66	T 48, T 228, T 240, T 313, T 315, T 316
4	407.16	Polymer-modified Emulsified Asphalt	702.04 (c)	) Polymer-modified Emulsified Asphalt	Distillation, Penetration @ 25 °C	< 40 CWT	1/day/production lot	Distibutor Truck on Project	1 Quart	R 66	T 49, T 59

				Table 1: Material Sampli	ng Manual Projec	t Levels 1 & 2				
c			ц	·		₿ >	D			Procedures
Type of Constructio	Pay Item Number	Pay Item Name	Materials Specificatio Number Material Name	Test	Minor Quantity Threshold	Minimum Acceptanc Sampling Frequenc <b>(per project)</b>	Acceptance Samplin Location	Sample Size <sup>(2)</sup>	Sampling	Testing <sup>(1)</sup>
				Slip AC Content	< 100 TONS	Stratified Random Sampling, 1/500 TON sublot per mix design.	Truck Batch Slip			Truck Slip Calculation
				Gradation	< 100 TONS	Stratified Random Sampling, 1/500 TON sublot per mix design.	Truck @ Plant or on Project <sup>11</sup>	Dependent on mix	R 97	Т 308, Т 30
				Air voids, VMA	< 100 TONS	Stratified Random Sampling, 1/500 TON sublot per mix design.	Truck @ Plant or on Project <sup>11</sup>	type <sup>9</sup>	R 97	T 166, T 209, T 269, PP 19
(əc			406.03 Bituminous Concrete Pavement	Mixing Temperature	< 100 TONS	Stratified Random Sampling, 1/500 TON sublot per mix design.	Truck @ Plant or on Project <sup>11</sup>			
cceptan	406.25 406.27	Marshall Bituminous Concrete Pavement (QA) Medium Duty Marshall Bituminous Concrete		Density-mat		Project less than 0.5 miles take 4 cores per day production. Project greater than 0.5 miles, 1 core per .5 miles, minimum of 6 cores per day.	In place	6" ID Core	R 67	T 166
A A	400.27	Pavement (QA)		Density-joint		See specifications	In place	6" ID core	R 67	T 166
llders (Q				Surface Tolerance		Project less than .5 miles, use straightedge only Project greater than .5 miles, use Road Surface Profiler 1/project, Wearing Surface only	In place	N/A		M 328 or Straight Edge
ng and Shou			702.02 Performance-Graded Asphalt Bind	Unit weight, Flashpoint, Rotational Viscosity, DSR - Original, Effect of heating mass, DSR - RTFO, DSR - PAV, Creep stiffness, m Value	< 200 TONS of Mix	1/1,500 TONS of Mix <sup>13</sup>	In-line @ plant	2 Quarts	R 66	T 48, T 228, T 240, T 313, T 315, T 316
avii			702.04 Emulsified Asphalt	Distillation, Penetration @ 25 °C	< 40 CWT	1/ 200 CWT	Distibutor Truck on Project	1 Quart	R 66	Т 49, Т 59
line F				Slip AC Content	< 100 TONS	Stratified Random Sampling, 1/500 TON sublot per mix design.	Truck Batch Slip			Truck Slip Calculation
ıt Mair				Gradation	< 100 TONS	Stratified Random Sampling, 1/500 TON sublot per mix design.	Truck @ Plant or on Project <sup>11</sup>	Dependent on mix	R 97	Т 308, Т 30
/emer				Air voids, VMA	< 100 TONS	Stratified Random Sampling, 1/500 TON sublot per mix design.	Truck @ Plant or on Project <sup>11</sup>	type <sup>9</sup>	R 97	T 312,T 166,T 209,T 269, R 35
te Pav			490.03 Superpave Bituminous Concrete P	Pavement Mixing Temperature	< 100 TONS	Stratified Random Sampling, 1/500 TON sublot per mix design.	Truck @ Plant or on Project <sup>11</sup>			
s Concre	490.30 (2011) 406.35	Superpave Bituminous Concrete Pavement (QA) (2011) Superpave Bituminous Concrete Pavement (QA)		Density-mat	R	Project less than 0.5 miles take 4 cores per day production. Project greater than 0.5 miles, 1 core per .5 miles, minimum of 6 cores per day.	In place	6" ID core	R 67	T 166
snot	406.36	Superpave Bituminous Concrete Pavement, Type		Density-joint		See specifications	In-place	6" ID core	R 67	T 166
Bitumin	(2018)	IVB (QA) (2018)		Surface Tolerance		Project less than .5 miles, use straightedge only Project greater than .5 miles, use Road Surface Profiler 1/project, Wearing Surface only	In place	N/A		M 328 or Straight Edge
		-	702.02 Performance-Graded Asphalt Bind	Unit weight, Flashpoint, Rotational Viscosity, DSR - Original, Effect of heating mass, DSR - RTFO, DSR - PAV, Creep stiffness, m Value	< 200 TONS of Mix	1/1,500 TONS of Mix <sup>13</sup>	In-line @ plant	2 Quarts	R 66	T 48, T 228, T 240, T 313, T 315, T 316
			702.04 Emulsified Asphalt	Distillation, Penetration @ 25 °C	< 40 CWT	1/ 200 CWT	Distibutor Truck on Project	1 Quart	R 66	T49, T59
o <u>e</u>	406.25			Slip AC Content	< 200 TONS of Mix	1 per project	Truck Batch Slip			Truck Slip Calculation
ving: Sid rk, Drive	(2011) 406.38 (2018)	Marshall Bituminous Concrete Pavement (2011) Hand Placed Bituminous Concrete Drives (2018)	406.03 Bituminous Concrete Pavement	Gradation	< 200 TONS of Mix	1 per project	Truck at Plant or on Project <sup>11</sup>	Dependent on mix type <sup>9</sup>	R 97	Т 308, Т 30
Pa	490.30	Supernave Bituminaus Constate Devement (2011)		Slip AC Content	< 200 TONS of Mix	1 per project	Truck Batch Slip			Truck Slip Calculation
Non Mainline Roads, Hand	(2011) 406.35 406.36 406.38 (2018)	Superpave Bituminous Concrete Pavement (2011) Superpave Bituminous Concrete Pavement Superpave Bituminous Concrete Pavement, Type IVB Hand Placed Bituminous Concrete Drives (2018)	490.03 Superpave Bituminous Concrete P		< 200 TONS of Mix		Truck at Plant or on Project <sup>11</sup>	Dependent on mix type <sup>9</sup>	R 97	T 164 or T 308, T 30

					Table 1: Material Sampling	Manual Proje	ct Levels 1 & 2				
Ľ			uo				ع ع ج	D D			Procedures
Type of Constructic	Pay Item Number	Pay Item Name	Materials Specificati Number	Material Name	Test	Minor Quantity Threshold	Minimum Acceptano Sampling Frequeno <b>(per project)</b>	Acceptance Sampli Location	Sample Size <sup>(2)</sup>	Sampling	Testing <sup>(1)</sup>
oncrete	501.32 (2011) 501.33 (2011) 501.34 (2011) 544.10	Concrete, High Performance Class AA (2011) Concrete, High Performance Class A (2011) Concrete, High Performance Class B (2011) Prefabricated Bridge Unit Superstructure	501.03	HPC Structural Concrete	Air Temperature Compressive Strength	< 10 CY	1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible <sup>7</sup>	1 cu ft for Compressive Strength or wheelbarrow needed for all tests	C 172 R 100	ASTM C231 ASTM C1064 T 22
Structural Co	501.35	Concrete, SCC	501.03	HPC Structural Concrete	Air Temperature Compressive Strength Spread (SCC)	< 10 CY	1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible <sup>7</sup>	1 cu ft for Compressive Strength or wheelbarrow needed	ASTM C172 R 100 ASTM C172	ASTM C231 ASTM C1064 T 22 ASTM C1611
HPC	501.36 (2011)	Concrete, High Performance Class LW (2011)	501.03	HPC Structural Concrete	Air Temperature Compressive Strength Unit weight (for lightweight aggregate only)	< 10 CY	1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible <sup>7</sup>	1 cu ft for	ASTM C172	ASTM C231 ASTM C1064 T 22 ASTM C173
		-	704.14	Lightweight Coarse Aggregate for Structural Concrete	Density		1 per placement	Stockpile at plant	0.5 to 2 cu ft	R 90	T 19
orn 3as Ictu	501.37 501.38 501.39	High Performance Concrete, Class PCD High Performance Concrete, Class PCS High Performance Concrete, Class SCC	501.03	HPC Structural Concrete	Air Temperature Compressive Strength Spread (SSC)	< 10 CY	1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible <sup>7</sup>	1 cu ft <sup>3</sup> for Compressive Strength or wheelbarrow needeo	ASTM C172 R 100 ASTM C172	ASTM C231 ASTM C1064 T 22 ASTM C1611
Structural Steel	506.50 506.55 506.56 506.57 506.60 506.75	Structural Steel, Rolled Beam Structural Steel, Plate Girder Structural Steel, Curved Plate Girder Structural Steel, Truss Structural Steel Structural Steel (LS)	714.04 714.05 714.06	Carbon Steel Bolts, Nuts and Washers High Strength Bolts, Nuts and Washers Heat Treated Structural Bolts	Ultimate Tensile Stress Ultimate Tensile Stress, Wedge Rockwell Hardness Ultimate Tensile Stress Ultimate Tensile Stress, Wedge Rockwell Hardness Ultimate Tensile Stress Ultimate Tensile Stress, Wedge		<ul> <li>4 - Each combination of bolt production lot, nut lot, washer lot, and DTI lot (4 - Each combination Tension Control Assembly Bolt production lot if used) to be incorporated into the project for main member connections as designated in the Contract or as defined in 714.01, or other connections as deemed necessary by the Resident Engineer.</li> </ul>	Original Manufacturer Shipping Container at the project or at fabrication facility	N/A	N/A	ASTM F606 ASTM F606 ASTM F606
rcing el	507.11 507.12 507.13	- Reinforcing Steel, Level I Reinforcing Steel, Level II Reinforcing Steel, Level III	714.13 713.01	Tension Control Assemblies Bar Reinforcement	Rockwell Hardness Rotational Capacity Test Ultimate Tensile Stress Yield Tensile Stress Elongation		1/grade/source	Stockpile on Project	6 ft	 N/A	ASTM F3125 T 244
Reinfo Ste	507.19	Mechanical Bar Connectors	713.02	Mechanical Splices for Bar Reinforcement	Ultimate Tensile Stress		3 per size	Stockpile at plant/Project (must be fully assembled before delivery to lab)	connector length plus 12 inches of bar on each end	r N/A	T 244
rete	510.21	Prestressed Concrete Box Beams	501.03	HPC Structural Concrete	Air Temperature Compressive Strength Spread (SCC)		1 per project (See note 5) 1 per project (See note 6) 1 per project (See note 6) 1 per project (See note 6)	- At plant, as close to point of deposit as - possible	1 cu ft for Compressive Strength or wheelbarrow needeo for all tests	ASTM C172 R 100 ASTM C172	ASTM C231 ASTM C1064 T 22 ASTM C1611
onci	510.21	Prestressed Concrete Voided Slabs	704.14	Lightweight Coarse Aggregate for Concrete	Density (lightweight only)		1 per project	Stockpile at plant	0.5 to 2 cu ft	R 90	т 19
tressed C	510.23 510.25 510.26	Prestressed Concrete Girders Prestressed Concrete Solid Slabs Prestressed Concrete NEXT D Beams	713.01	Bar Reinforcement	Ultimate Tensile Stress Yield Tensile Stress Elongation		1/grade/source	at plant	6 ft	N/A	T 244
ast/Prest	540.10 543.10	Precast Concrete Structure Contractor-Fabricated Precast Concrete Structure	713.02	Mechanical Splices for Bar Reinforcement	Ultimate Tensile Stress		3 per size	Stockpile at plant/Project (must be fully assembled before delivery to lab)	connector length plus 12 inches of bai on each end		T 244
Prec		-		Prestressing Strands	Tensile testing		1 per project	at plant	6 ft 3 cubes cast on	N/A	T 244
			707.03	Mortar, Type IV	Compression Strength of cubes		1 per placement	Project	project	R 64	ASTM C109
	510.24	Grouting Shear Keys	707.03	Mortar, Type IV	Compression Strength of cubes		1 per placement	Project	3 cubes cast on project	R 64	ASTM C109

					Table 1: Material Sampling	Manual Proje	ect Levels 1 & 2				
uc			ion				S S	D L			Procedures
Type of Constructic	Pay Item Number	Pay Item Name	Materials Specificati Number	Material Name	Test	Minor Quantity Threshold	Minimum Acceptan Sampling Frequenc <b>(per project)</b>	Acceptance Sampli Location	Sample Size <sup>(2)</sup>	Sampling	Testing <sup>(1)</sup>
			501.03	HPC Structural Concrete	Air Temperature Compressive Strength Spread (SCC)		1 per project (See note 5) 1 per project (See note 6) 1 per project (See note 6) 1 per project (See note 6)	At plant, as close to point of deposit as possible	1 cu ft for Compressive Strength or wheelbarrow needeo for all tests	ASTM C172 R 100 ASTM C172	ASTM C231 ASTM C1064 T 22 ASTM C1611
			704.14	Lightweight Coarse Aggregate for Concrete	Density (lightweight only)		1 per project	Stockpile at plant	0.5 to 2 cu ft	R 90	T 19
it			707.03	Mortar, Type IV	Compression Strength of cubes		1 per placement	Project	3 cubes cast on project	R 64	ASTM C109
dge Ur			713.01	Bar Reinforcement	Tensile Testing Elongation		1/grade/source	at plant	6 ft	N/A	T 244
cated Brid	544.10	Bridge Unit Superstructure	713.02	Mechanical Splices for Bar Reinforcement	Tensile testing		3 per size	Stockpile at plant/Project (must be fully assembled before delivery to lab)	connector length plus 12 inches of bar on each end	r N/A	T 244
Prefabri		-	714.04	Carbon Steel Bolts, Nuts and Washers	Ultimate Tensile Stress Ultimate Tensile Stress, Wedge Rockwell Hardness		4 - Each combination of bolt production lot, nut lot, washer lot, and DTI lot (4 - Each combination Tension				ASTM F606
		-	714.05	High Strength Bolts, Nuts and Washers	Ultimate Tensile Stress Ultimate Tensile Stress, Wedge Rockwell Hardness		Control Assembly Bolt production lot if used) to be incorporated into the project for main member connections as designated in the Contract or as defined	Original Manufacturer Shipping Container at the project or at fabrication facility	N/A	N/A	ASTM F606
			714.06	Heat Treated Structural Bolts	Ultimate Tensile Stress Ultimate Tensile Stress, Wedge Rockwell Hardness		in 714.01, or other connections as deemed necessary by the Resident Engineer.				ASTM F606
	_		714.13	Tension Control Assemblies	Rotational Capacity Test						ASTM F3125
ctural nber	522.20 522.25	Structural Lumber and Timber, Untreated Structural Lumber and Timber, Treated -	709.01	Structural Lumber and Timber	Moisture Testing		1 per project	Project	N/A	N/A	Noisture Meter calibrated to
Struc Lun	522.40		709.03	Structural Glued Laminated Timber	Moisture Testing		1 per project	Project	N/A	N/A	ASTM D4444
	525.11 525.33 525.33 525.34 525.41 525.44	Bridge Railing, Galvanized HD Steel Beam/Fascia Mounted	714.07	Anchor Bolts, Bridge Railing	Ultimate Tensile Stress		2 - Each combination of anchor bolt production lot, nut lot, and washer lot to be incorporated into the project	Original Manufacturer Shipping Container at the project or at fabrication facility	N/A	N/A	ASTM F606
			501.03	HPC Structural Concrete	Air Temperature Compressive Strength Spread (SCC) Unit weight (for lightweight aggregate only)	< 10 CY	1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible <sup>7</sup>	1 cu ft for Compressive Strength or wheelbarrow needeo for all tests	ASTM C172 R 100 ASTM C172 ASTM C172	ASTM C231 ASTM C1064 T 22 ASTM C1611 ASTM C173
		-	704.14	Lightweight Coarse Aggregate for Concrete	Density (for lightweight aggregate only)		1 per placement	Stockpile at plant	0.5 to 2 cu ft	R 90	T 19
бu	525.45	Bridge Railing, Galvanized Steel Tubing/Concrete Combination	713.01	Bar Reinforcement	Ultimate Tensile Stress Yield Tensile Stress Elongation		1/grade/source	Stockpile on Project	6 ft	N/A	T 244
dge Raili			713.02	Mechanical Splices for Bar Reinforcement	Ultimate Tensile Stress		3 per size	Stockpile on Project (must be fully assembled before delivery to lab)	connector length plus 12 inches of bai on each end	r N/A	T 244
Bri			714.07	Anchor Bolts, Bridge Railing	Ultimate Tensile Stress		2 - Each combination of anchor bolt production lot, nut lot, and washer lot to be incorporated into the project	Original Manufacturer Shipping Container at the project or at fabrication facility	N/A	N/A	ASTM F606
	525.50 525.55 525.60	Bridge Railing Repair, Type II	714.07	Anchor Bolts, Bridge Railing	Ultimate Tensile Stress		2 - Each combination of anchor bolt production lot, nut lot, and washer lot to be incorporated into the project	Original Manufacturer Shipping Container at the project or at fabrication facility	N/A	N/A	ASTM F606
			501.03	HPC Structural Concrete	Air Temperature Compressive Strength Spread (SCC) Unit weight (for lightweight aggregate only)		1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible <sup>7</sup>	1 cu ft for Compressive Strength or wheelbarrow needeo for all tests	ASTM C172 R 100 ASTM C172 ASTM C172	ASTM C231 ASTM C1064 T 22 ASTM 1611 ASTM C173
	525.70	- Bridge Railing, Concrete F-Shape	704.14	Lightweight Coarse Aggregate for Concrete	Density (for lightweight aggregate only)		1 per placement	at plant	0.5 to 2 cu ft	R 90	T 19
	525.70	Bridge raining, Concrete i -Onape	713.01	Bar Reinforcement	Ultimate Tensile Stress Yield Tensile Stress Elongation		1/grade/source	Stockpile on Project	6 ft	N/A	T 244
			713.02	Mechanical Splices for Bar Reinforcement	Ultimate Tensile Stress		3 per size	Stockpile on Project (must be fully assembled before delivery to lab)	connector length plus 12 inches of bar on each end	r N/A	T 244

					Table 1: Material Sampling	Manual Projec	t Levels 1 & 2				
			u				ê >	D		Pi	rocedures
Type of Construction	Pay Item Number	Pay Item Name	Materials Specificatic Number	Material Name	Test	Minor Quantity Threshold	Minimum Acceptanc Sampling Frequenc (per project)	Acceptance Samplin Location	Sample Size <sup>(2)</sup>	Sampling	Testing <sup>(1)</sup>
	541.21 541.22 541.25 541.30	Concrete, Class AA Concrete, Class A Concrete, Class B Concrete, Class C	541.03	Structural Concrete	Air Temperature Compressive Strength Unit weight (for lightweight aggregate only)	< 10 CY	1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible <sup>7</sup>	1 cu ft for Compressive Strength or wheelbarrow needed for all tests	ASTM C172 R 100 ASTM C172	ASTM C231 ASTM C1064 T 22 ASTM C173
ete	541.31 541.40	Concrete, Class D Concrete, Class LW	704.14	Lightweight Coarse Aggregate for Structural Concrete	Density (for lightweight aggregate only)		1 per placement	Stockpile at plant	0.5 to 2 cu ft	R 90	T 19
ctural Concre					Air Temperature				1 cu ft for	ASTM C172  ASTM D5971	ASTM C231 ASTM C1064
Stru	541.45	Controlled Density (Flowable) Fill	541.03	Structural Concrete	Compressive Strength		1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible <sup>7</sup>	Compressive Strength or wheelbarrow needed for all tests	Molds to be cut and taped prior to filling in accordance with ACI 229, Section 8.4	ASTM D4832
epair	580 10	Repair of Concrete Superstructure, Class I	541.03 501.03 501.03	Structural Concrete High Performance Structural Concrete (2011) Performance Based Structural Concrete (2018)	Air Temperature Compressive Strength	< 10 CY	1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible <sup>7</sup>	1 cu ft for Compressive Strength or wheelbarrow needed for all tests	ASTM C172 R 100	ASTM C231 ASTM C1064 T 22
ural Concrete R	580.11 580.12 580.13 580.14 580.15	Repair of Concrete Superstructure, Class II Repair of Concrete Superstructure, Class III Repair of Concrete Substructure, Class I Repair of Concrete Substructure, Class II Repair of Concrete Substructure, Class III	780.01(b)	Concrete Repair Material, Type I Concrete Repair Material, Type II Concrete Repair Material, Type IV	Compressive Strength		1 per first 25 units, then 1 per 100 units (bags) after	on project, as close to point of deposit as practical	3 cubes cast on project	R 64	ASTM C109
Struct	580.19	Concrete, Class AA Overlay	780.01(c)	Concrete Repair Material, Type III	Compressive Strength		1 per first 25 units, then 1 per 100 units (bags) after	on project, as close to point of deposit as practical	1 cu ft for Compressive Strength Cylinders	ASTM C172	ASTM C231
Pincrete for Manhole/Catch Basins FOR CAST-IN-PLACE	604.10 5 604.11	Concrete Catch Basin with Cast Iron Grate Concrete Manhole with Cast Iron Grate	541.03	Structural Concrete	Air Temperature Compressive Strength	< 10 CY	1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible <sup>7</sup>	1 cu ft for Compressive Strength or wheelbarrow needed for all tests	ASTM C172 R 100	ASTM C231 ASTM C1064 T 22
Cc Underdrains		Underdrain pipe Underdrain Carrier pipe	704.16	Drainage Aggregate	Gradation	< 600 CY	1/3000 CY	Stockpile on Project	55	R 90	T 27

				Table 1: Material Sam	pling Manual Project	t Levels 1 & 2				
L		tion				icy ice	<u>b</u>	_		Procedures
Pay Item Numbe	Pay Item Name	Materials Specifical Number	Material Name	Test	Minor Quantity Threshold	Minimum Acceptar Sampling Frequen <b>(per project)</b>	Acceptance Sampl Location	Sample Size <sup>(2)</sup>	Sampling	Testing <sup>(1)</sup>
616.27 616.28	Cast-in-place Concrete Curb, Type A			Air Temperature				1 cu ft for	ASTM C172	ASTM C231 ASTM C1064
616.45 (2011) 618.10 618.11 621.45 (2011)	Cast-in-place Concrete Curb, Type B Portland Cement Concrete Gutter (2011) Portland Cement Sidewalk, 5 inch Portland Cement Sidewalk, 8 inch Concrete Median Barrier (2011)	541.03	Structural Concrete	Compressive Strength	< 10 CY	1 per 75 CY (See note 4)	on project, as close to point of deposit as possible <sup>7</sup>	Compressive Strength or wheelbarrow needed for all tests	R 100	T 22
616.300				Slip AC Content	< 200 TONS of Mix	1 per project	Truck @ Plant or on Project <sup>11</sup>			Truck Slip Calculatio
(2011) 616.305 616.31 (2011) 616.315	Bituminous Concrete Curb Type A (ton) (2011) Bituminous Concrete Curb Type A (lft) Bituminous Concrete Curb Type B (ton) (2011) Bituminous Concrete Curb Type B (lft)	406.03a	Bituminous Concrete Pavement	Gradation	< 200 TONS of Mix	1 per project	Truck @ Plant or on Project <sup>11</sup>	- Dependent on mix type <sup>9</sup>	R 97	T 164 or T 308, T 30
		•• <b>••</b> ••		Slip AC Content	< 200 TONS of Mix	1 per project	Truck @ Plant or on Project <sup>11</sup>		l	Truck Slip Calculatio
		616.13	Bituminous Concrete Gutters and Traffic Islands	Gradation	< 200 TONS of Mix	1 per project	Truck @ Plant or on Project <sup>11</sup>	Dependent on mix	R 97	T 164 or T 308, T 3
	-	406.03a	Bituminous Concrete Pavement	Slip AC Content	< 200 TONS of Mix	1 per project	Truck @ Plant or on Project <sup>11</sup>	type <sup>9</sup>		Truck Slip Calculat
616.47	Bituminous Concrete Gutters and Traffic Islands			Gradation	< 200 TONS of Mix	1 per project	Truck @ Plant or on Project <sup>11</sup>		R 97	T 164 or T 308, T
618.15	Bituminous Concrete Sidewalk	490.03a		Slip AC Content	< 200 TONS of Mix	1 per project	Truck @ Plant or on Project <sup>11</sup>	<b>_</b> .		Truck Slip Calculat
		(2018)	Superpave Bituminous Concrete Pavement (2011) Bituminous Concrete Pavement (2018)	) Gradation	< 200 TONS of Mix	1 per project	Truck @ Plant or on Project <sup>11</sup>	Dependent on mix type <sup>9</sup>	R 97	T 164 or T 308, T
646.400 to 646.479	Durable Pavement Markings	754.01(b) 754.01(c)	Optics, Type I Optics, Type II Optics, Type III Thermoplastic Pavement Marking, Type A	Retroreflectivity	N/A <sup>14</sup>	For Verification Only <sup>14</sup>	on project	2 Miles	N/A	ASTM D7585
				Air				1 cu ft for	ASTM C172	ASTM C231
675.40 (2011)	Foundation for W/ Change Steel Dept	541.03	Structural Concrete	Temperature	< 10 CY	1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible <sup>7</sup>	Compressive Strength or wheelbarrow needed	R 100	ASTM C1064 T 22
(2011) 675.41	Foundation for W-Shape Steel Post (18 (2011), 24, 30 inch diameter)			Compressive Strength				for all tests	R 100	1 22
675.42	· · · / · · · · · · · · · · · · · · · ·	713.01	Bar Reinforcement	Ultimate Tensile Stress Yield Tensile Stress Elongation		1/grade/source	at plant or on project	6 ft	N/A	T 244
675.43	Foundation for Tubular Steel Post	541.03	Structural Concrete	Air Temperature Compressive Strength	< 10 CY	1 per 50 CY (See Note 3)	on project as close to point of deposit as possible <sup>7</sup>	1 cu ft for Compressive Strength or wheelbarrow needed	ASTM C172 R 100	ASTM C231 ASTM C1064 T 22
				Compressive Strength				for all tests	K IOU	1 22
				Air Temperature			on project, as close to point of deposit as	Compressive	ASTM C172	ASTM C231 ASTM C1064
		541.03	Structural Concrete	Compressive Strength	< 10 CY	1 per 50 CY (See Note 3)	possible <sup>7</sup>	Strength or wheelbarrow needed for all tests	R 100	T 22
677.12	Overhead Traffic Sign Support, Cantilever Overhead Traffic Sign Support, Multi-Support	713.01	Bar Reinforcement	Ultimate Tensile Stress Yield Tensile Stress Elongation		1/grade/source	at plant or on project	6 ft	N/A	Т 244
677.13 677.22 677.23	Overhead Traffic Sign Support, Cantilever with – Lighting Overhead Traffic Sign Support, Multi-support with	714.05	High Strength Bolts, Nuts and Washers	Ultimate Tensile Stress Ultimate Tensile Stress, Wedge Rockwell Hardness		4 - Each combination of bolt production lot, nut lot,				ASTM F606
677.25 678.15	Lighting Remove and Reset Overhead Traffic Sign		g. exergar boke, ride and ridehold	Rotational Capacity Test		washer lot, and DTI lot (4 - Each combination Tension Control Assembly Bolt production lot if used) to be	Original Manufacturer Shipping Container			ASTM F3125
678.15 679.46	Support Traffic Control Signal System, Intersection Street Light Assembly	714.06	Heat Treated Structural Bolts	Ultimate Tensile Stress Ultimate Tensile Stress, Wedge Rockwell Hardness		incorporated into the project for main member connections as designated in the Contract or as defined in 714.01, or other connections as deemed necessary	at the project or at fabrication facility	N/A	N/A	ASTM F606
				Rotational Capacity Test		by the Resident Engineer.			_	ASTM F3125
	-	714.09	Anchor Bolts, Traffic Signals, Lighting, and Overhead Sign Structures <sup>10</sup>	Ultimate Tensile Stress		1 - Each anchor bolt production lot to be incorporated into the project. Include washer and nut with sample.	Original Manufacturer Shipping Container at the project or at fabrication facility	1 bolt, including threads (at least 18" long)	N/A	ASTM F606

				Table 1: Material Sam	pling Manual Project	Levels 1 & 2				
Ľ		uo				e >	D			Procedures
Type of Constructic	Pay Item Number Pay Item Name	Materials Specificati Number	Material Name	Test	Minor Quantity Threshold	Minimum Acceptano Sampling Frequenc <b>(per project)</b>	Acceptance Sampli Location	Sample Size <sup>(2)</sup>	Sampling	Testing <sup>(1)</sup>
Notes	(3) Total placement for day split into equal be out-of-specification then the Contractor	vise noted. The sample size should be seled sublots not to exceed 50 CY, test yardage must test each consecutive load until 3 cor	chosen randomly. The test yardage is used to	determine which load to test with p check 4th consecutive load to verif	proper sample collection tech fy. Deck pours shall have no	terial visually passes a 2", 1.5", or 1" sieve then the sam nniques followed Check first load for temperature, and a less than 3 acceptance tests, regardless of total CY pla	air content. This will not be counted as t	he acceptance test for the		
		ecked at the begining of the first load. This			si method.					
		by Owner representative at the frequency in	•	e to be witnessed by Owner represe	entative. Minimum of six Co	mpressive Strength for determining detensioning, to be	cured with the piece. Four specimens to	o determine 28 day and shi	pping strengths a	nd are to be cured with the
	(7) If the sample cannot be safely obtained	from the end of pump truck hose at the po	idicated, per project. However, all QC tests are int of placement (i.e. without retracting the hose size is 165 lbs, 55 lbs, and 22 lbs respectively.			first load as well as the load that the Compressive Stre e mixer truck.	ngth are fabricated from should be tested	l by QC.		
	(9) The sample size for HMA depends upo mass (weight) or percentage printed on th	00 0	nix, see following table. Minimum sample sizes	are in accordance with AASHTO T <sup>2</sup>	168 and are suitable for rout	ine testing. However, actual sample size is dependent ι	pon the type and number of tests to whi	ch the material is to be sub	jected. AC Conte	ent is determined from the
	<ul> <li>(11) Bituminous mixtures sampled on projects</li> <li>(12) For projects less than 1250 CY of sub (13) Acceptance sampling will occur at the</li> </ul>	base material, the Agency shall be respons frequency prescribed with acceptance test	, material transfer vehicle hopper, or the paver sible for the testing and projects over 1250 CY 1	the Contractor is responsible for the 0 Tons of mix. Acceptance testing i	e determination of the target	density. For each source, subbase materials shall be sons of mix sampling frequency at the discretion of the HI		) CY and then once every (	3000 CY thereaft	er.
			Mix Type: MS		I / IS	II / IIS	III / IIIS	IV / IVS	VS	VI / VIS
			Maximum Nominal Aggregate Size, in: 1 1/	/2"	1"	3/4"	1/2"	3/8"	1/4"	3/16"
			Minimum Sample Size, lbs: 25		20	16	12	8	6	4

(				Table 2: Material Sam	npling Manual Proj	ect Level 3				
			Б		<u> </u>	8 ×	 ۲			Procedures
Type of Constructio	Pay Item Number	Pay Item Name	/aterials Specificati Number Material Name	Test	Minor Quantity Threshold	Minimum Acceptanc Sampling Frequenc <b>(per project)</b>	Acceptance Samplir Location	Sample Size <sup>(2)</sup>	Sampling	Testing <sup>(1)</sup>
	203.30	Earth Borrow	Z 703.02 Earth Borrow	Moisture-Density Moisture Density	< 300 CY < 300 CY	1/Soil type 1/2000 CY 1/2000 CY	Stockpile In place In place	50 2	R 90	T 99 T 255 or T 310 T 191 or T 310
1ents	203.31	Sand Borrow	703.03 Sand Borrow and Cushion	Gradation Moisture-Density Moisture Density	< 300 CY < 300 CY < 300 CY	1 per project 1/10,000 CY/Source 1 per project 1 per project	In place Stockpile In place In place	22 50 20	R 90 R 90	T 27, T 11 T 99 T 255 or T 310 T 191 or T 310
Embankır	203.32	Granular Borrow	703.04 Granular Borrow	Gradation Moisture-Density Moisture Density	< 300 CY < 300 CY < 300 CY < 300 CY	1 per project 1/10,000 CY/Source 1 per project 1 per project	In place Stockpile In place In place In place	22 50 2	R 90 R 90	T 27, T 11 T 99 T 255 or T 310 T 191 or T 310
l	203.35	Gravel Backfill for Slope Stabilization	704.07 Gravel Backfill for Slope Stabilization	Gradation Moisture-Density Moisture Density	< 300 CY < 300 CY < 300 CY < 300 CY	1 per project 1/10,000 CY/Source 1 per project 1 per project	In place Stockpile In place In place In place	See note 2 50 20	R 90 R 90	T 27, T 11 T 99 T 255 or T 310 T 191 or T 310
vation for uctures	204.30	Granular Backfill for Structures	704.08 Granular Backfill for Structures	Gradation Moisture-Density Moisture	< 300 CY < 300 CY	1 per project 1/10,000 CY/Source 1/500 CY	In place Stockpile In place	See note 2 250 30	R 90 R 90	T 27, T 11 T 99 T 255 or T 310
Exca	<b>_</b>		704.05B Crushed Gravel for Subbase, Fine Graded	Density Gradation Gradation	< 300 CY < 300 CY < 300 CY	1/500 CY 1/3000 CY 1 per project	In place In place Stockpile on project	See note 2 See note 2	R 90 R 90	T 191 or T 310 T 27, T 11 T 27, T 11
1	301.15	Subbase of Gravel	704.04 Gravel for Subbase	Moisture-Density Moisture Density	< 300 CY < <u>300 CY</u>	1/10,000 CY/Source 1 per project 1 per project	Stockpile In place In place	250	R 90	T 180 T 310 T 310
Se	301.25	Subbase of Crushed Gravel, Coarse Graded	704.05A Crushed Gravel for Subbase, Coarse Graded	Gradation Moisture-Density Moisture Density	< 300 CY < 300 CY < 300 CY < 300 CY	1 per project 1/10,000 CY/Source <sup>12</sup> 1 per project 1 per project 1 per project	Stockpile on project Stockpile In place In place In place	See note 2 250	R 90 R 90	T 27, T 11 T 180 T 310 T 310 T 310
Subbas	301.26 301.28	Subbase of Crushed Gravel, Fine Graded	704.05B Crushed Gravel for Subbase, Fine Graded	Gradation Moisture-Density Moisture Density	< 300 CY < 300 CY < 300 CY < 300 CY	1 per project 1/10,000 CY/Source <sup>12</sup> 1 per project 1 per project	Stockpile on project Stockpile In place In place	See note 2 250	R 90 R 90	T 27, T 11 T 180 T 310 T 310 T 310
	301.35	Subbase of Dense Graded Crushed Stone	704.06 Dense Graded Crushed Stone for Subbase	Gradation Moisture-Density Moisture	< 300 CY < 300 CY	1 per project 1/10,000 CY/Source <sup>12</sup> 1 per project	Stockpile on project Stockpile In place	See note 2 250	R 90 R 90	T 27, T 11 T 180 T 310 T 310 T 310
د	301.40	Subbase, RAP	301.02 Subbase, RAP	Density Gradation	< 300 CY < 400 TONS	1 per project 1 per project	In place In place	See note 2	R 90	T 27, T 11
RSB	310.20	Full Depth Reclamation (FDR)	310.02 Reclaimed Base (2011) Full Depth Reclamation (2018)	Gradation Moisture-Density Moisture Density		1/2500 sy for first 10,000 sy 1/10,000 sy thereafter 1/10,000 CY/Source <sup>12</sup> 1/4000 sy for first 10,000 sy 1/10,000 sy thereafter 1/4000 sy for first 10,000 sy 1/10,000 sy thereafter	In place Stockpile In place In place	165 50	R 90 R 90	T 27 T 180 T 310 T 310
Aggregate Surface Course	401.10	Aggregate Surface Course	<ul> <li>704.12</li> <li>(2011)</li> <li>704.12 (a)</li> <li>(2018)</li> <li>Aggregate for Surface Course and Shoulders</li> <li>(2011)</li> <li>Aggregate Surface Course (2018)</li> </ul>	Gradation Moisture-Density Moisture	< 300 CY < 300 CY	1 per project 1/10,000 CY/Source 1 per project	In place Stockpile In place	100 50	R 90 R 90	T 27, T 11 T 180 T 255 or T 310
	402.12	Aggregate Shoulders	704.12 (2011) Aggregate for Surface Course and Shoulders (2011) (2011) 704.12 (b) Aggregate for Shoulders (2018)	Density Gradation	< 300 CY < 300 CY	1 per project 1 per project	In place In place	100	R 90	T 191 or T 310 T 27, T 11
egate Should	402.13	Aggregate Shoulders, RAP	(2018) Aggregate for Shoulders (2018) 402.02 (2011) 704.12 (b) Aggregate for Shoulders (2018)	Gradation	< 300 CY	1 per project	In place	100	R 90	T 27, T 11
Aggre	403.12	Aggregate Shoulders, RAP with RAS (2018)	(2018) 704.12 (b) (2018) Aggregate for Shoulders (2018)	Gradation	< 300 CY	1 per project	In place	100	R 90	T 27, T 11
Surface Treatment Materials	404.65	Emulsified Asphalt	702.04 Emulsified Asphalt	Distillation, Penetration @ 25 °C	< 40 CWT	1/project/production lot	Distributor Truck on Project	1 Quart	R 66	T 49, T 59

				Table 2: Material Sampl	ing Manual Proj	ect Level 3				
		u				Û >	D			Procedures
Pay Item Number	Pay Item Name	Materials Specificatic Number	Material Name	Test	Minor Quantity Threshold	Minimum Acceptanc Sampling Frequenc <b>(per project)</b>	Acceptance Samplin Location	Sample Size <sup>(2)</sup>	Sampling	Testing <sup>(1)</sup>
415	20 Cold Mixed Recycled Bituminous Pavement	415.02	Cold Mixed Recycled Bituminous Pavement	Density		1/2000ft/lane/lift	In place			T 310 or ASTM D7
415.	25 Emulsified Asphalt, Cold Mixed	415.02	Emulsified Asphalt	Distillation, Penetration @ 25 °C	< 40 CWT	1/day/production lot	Distributor Truck on Project	1 Quart	R66	T 49, T 59
				Slip AC Content	< 100 TONS	1/1000 TONS for first 1,000 TONS, 1/day thereafter	Truck Batch Slip			Truck Slip Calcula
				Gradation	< 100 TONS	1/1000 TONS for first 1,000 TONS, 1/day thereafter	Truck @ Plant or on Project <sup>11</sup>	Dependent on mix	<u>R 97</u>	<u>T 308, T 30</u>
				Air voids, VMA	< 100 TONS	1/1000 TONS for first 1,000 TONS, 1/day thereafter	Truck @ Plant or on Project <sup>11</sup>	type <sup>9</sup>	R 97	T 166, T 209, T 269
				Mixing Temperature	< 100 TONS	1/1000 TONS for first 1,000 TONS, 1/day thereafter	Truck @ Plant or on Project <sup>11</sup>			
	Marshall Bituminous Concrete Pavement (Method	406.03	Bituminous Concrete Pavement	Density-mat		Project less than 0.5 miles take 4 cores per day production. Project greater than 0.5 miles, 1 core per .5 miles, minimum of 6 cores per day.	In place	6" ID Core	R 97	T 166
406 406	25 Spec)			Density-joint		See specifications	In place	6" ID core	R 97	T 166
400	Pavement			Surface Tolerance		Project less than .5 miles, use straightedge only Project greater than .5 miles, use Road Surface Profiler 1/project, Wearing Surface only	In place	N/A		M 328 or Straigh
		702.02	Performance-Graded Asphalt Binder	Unit weight, Flashpoint, Rotational Viscosity, DSR - Original, Effect of heating mass, DSR - RTFO, DSR - PAV, Creep stiffness, m Value	< 200 TONS of Mix	1/1,500 TONS of Mix <sup>13</sup>	In-line @ plant	2 Quarts	R 66	T 48, T 228, T 240 T 315, T 31
		702.04	Emulsified Asphalt	Distillation, Penetration @ 25 °C	< 40 CWT	1/project/production lot	Distibutor Truck on Project	1 Quart	R 66	T 49, T 59
				Slip AC Content	< 100 TONS	1/1000 TONS for first 1,000 TONS, 1/day thereafter	Truck Batch Slip			Truck Slip Calcu
				Gradation	< 100 TONS	1/1000 TONS for first 1,000 TONS, 1/day thereafter	Truck @ Plant or on Project <sup>11</sup>		R 97	T 308, T 3
				Air voids, VMA	< 100 TONS	1/1000 TONS for first 1,000 TONS, 1/day thereafter	Truck @ Plant or on Project <sup>11</sup>	Dependent on mix type <sup>9</sup>	R 97	T 312,T 166,T 209 35
				Mixing Temperature	< 100 TONS	1/1000 TONS for first 1,000 TONS, 1/day thereafter	Truck @ Plant or on Project <sup>11</sup>			
490. (201	1) (Method Spec) 1) Superpose Bituminous Constate Devement	490.03	Superpave Bituminous Concrete Pavement	Density-mat		Project less than 0.5 miles take 4 cores per day production. Project greater than 0.5 miles, 1 core per .5 miles, minimum of 6 cores per day.	In place	6" ID core	R 97	T 166
406	35 (Method Spee)			Density-joint		See specifications	In-place	6" ID core	R 97	T 166
406. (201	30 Superpove Pituminoue Constate Devement Type			Surface Tolerance		Project less than .5 miles, use straightedge only Project greater than .5 miles, use Road Surface Profiler 1/project, Wearing Surface only	In place	N/A		M 328 or Straigh
		702.02	Performance-Graded Asphalt Binder	Unit weight, Flashpoint, Rotational Viscosity, DSR - Original, Effect of heating mass, DSR - RTFO, DSR - PAV, Creep stiffness, m Value	< 200 TONS of Mix	1/1,500 TONS of Mix <sup>13</sup>	In-line @ plant	2 Quarts	R 66	T 48, T 228, T 24( T 315, T 31
		702.04	Emulsified Asphalt	Distillation, Penetration @ 25 °C	< 40 CWT	1/ project/production lot	Distibutor Truck on Project	1 Quart	R 66	<u>T 49, T 5</u>
				Slip AC Content	< 100 TONS	1/500 TONS	Truck Batch Slip	Dependent on mix		Truck Slip Calcu
407	15 Bonded Wearing Course	407.03	Bonded Wearing Course	Gradation	< 100 TONS	1/500 TONS	Truck @ Plant or on Project <sup>11</sup>		R 97	T 308, T 3
L.				Mixing Temperature	< 100 TONS	1/500 TONS	Truck @ Plant or on Project <sup>11</sup>	type <sup>s</sup>		T 49, T 59
	16 Polymer-modified Emulsified Asphalt		) Polymer-modified Emulsified Asphalt	Distillation, Penetration @ 25 °C	< 40 CWT	1/day/production lot	Distibutor Truck on Project	1 Quart	R 66	

			C				_			Procedures
	Pay Item Number	Pay Item Name	Materials Specification Number Material Name	Test	Minor Quantity Threshold	Minimum Acceptance Sampling Frequency <b>(per project)</b>	Acceptance Sampling Location	Sample Size <sup>(2)</sup>	Sampling	Testing (1)
				Slip AC Content	< 100 TONS	Stratified Random Sampling, 1/500 TON sublot per mix design.	Truck Batch Slip			Truck Slip Calcu
				Gradation	< 100 TONS	Stratified Random Sampling, 1/500 TON sublot per mix design.	Truck @ Plant or on Project <sup>11</sup>	Dependent on mix	R 97	T 308, T 30
				Air voids, VMA	< 100 TONS	Stratified Random Sampling, 1/500 TON sublot per mix design.	Truck @ Plant or on Project <sup>11</sup>	type <sup>9</sup>	R 97	T 166, T 209, T 26 19
			406.03 Bituminous Concrete Pavement	Mixing Temperature	< 100 TONS	Stratified Random Sampling, 1/500 TON sublot per mix design.	Truck @ Plant or on Project <sup>11</sup>			
	406.25 406.27	Marshall Bituminous Concrete Pavement (QA) Medium Duty Marshall Bituminous Concrete		Density-mat		Project less than 0.5 miles take 4 cores per day production. Project greater than 0.5 miles, 1 core per .5 miles, minimum of 6 cores per day.	In place	6" ID Core	R 97	T 166
	100.27	Pavement (QA)		Density-joint		See specifications	In place	6" ID core	R 97	T 166
				Surface Tolerance		Project less than .5 miles, use straightedge only Project greater than .5 miles, use Road Surface Profiler 1/project, Wearing Surface only	In place	N/A		M 328 or Straig
		-	702.02 Performance-Graded Asphalt Binder	Unit weight, Flashpoint, Rotational Viscosity, DSR - Original, Effect of heating mass, DSR - RTFO, DSR - PAV, Creep stiffness, m Value	< 200 TONS of Mix	1/1,500 TONS of Mix <sup>13</sup>	In-line @ plant	2 Quarts	R 66	T 48, T 228, T 2 T 315, T 3
			702.04 Emulsified Asphalt	Distillation, Penetration @ 25 °C	< 40 CWT	1/ project	Distibutor Truck on Project	1 Quart	R 66	T 49, T
F				Slip AC Content	< 100 TONS	Stratified Random Sampling, 1/500 TON sublot per mix design.	Truck Batch Slip			Truck Slip Cal
				Gradation	< 100 TONS	Stratified Random Sampling, 1/500 TON sublot per mix design.	Truck @ Plant or on Project <sup>11</sup>	Dependent on mix	R 97	T 308, T
				Air voids, VMA	< 100 TONS	Stratified Random Sampling, 1/500 TON sublot per mix design.	Truck @ Plant or on Project <sup>11</sup>	type <sup>9</sup>	R 97	T 312,T 166,T 2 R 35
1	490.30	Superpave Bituminous Concrete Pavement (QA)	490.03 Superpave Bituminous Concrete Pavement	Mixing Temperature	< 100 TONS	Stratified Random Sampling, 1/500 TON sublot per mix design.	Truck @ Plant or on Project <sup>11</sup>			
(2 4	2011) 406.35 406.36	(2011) Superpave Bituminous Concrete Pavement (QA)		Density-mat		Project less than 0.5 miles take 4 cores per day production. Project greater than 0.5 miles, 1 core per .5 miles, minimum of 6 cores per day.	In place	6" ID core	R 97	T 166
	2018)	Superpave Bituminous Concrete Pavement, Type IVB (QA) (2018)		Density-joint		See specifications	In-place	6" ID core	R 97	T 166
(	/			Surface Tolerance		Project less than .5 miles, use straightedge only Project greater than .5 miles, use Road Surface Profiler 1/project, Wearing Surface only	In place	N/A		M 328 or Strai
			702.02 Performance-Graded Asphalt Binder	Unit weight, Flashpoint, Rotational Viscosity, DSR - Original, Effect of heating mass, DSR - RTFO, DSR - PAV, Creep stiffness, m Value	< 200 TONS of Mix	¥	In-line @ plant	2 Quarts	R 66	T 48, T 228, T 2 T 315, T 3
			702.04 Emulsified Asphalt	Distillation, Penetration @ 25 °C	< 40 CWT	1/ project	Distibutor Truck on Project	1 Quart	R 66	Т 49, Т 4
(2 4	406.25 (2011) 406.38	Marshall Bituminous Concrete Pavement (2011) Hand Placed Bituminous Concrete Drives (2018)	406.03 Bituminous Concrete Pavement	Slip AC Content Gradation	< 200 TONS of Mix		Truck Batch Slip Truck @ Plant or on Project <sup>11</sup>	Dependent on mix type <sup>9</sup>	R 97	Truck Slip Calc T 308, T 3
i i i i i i i i i i i i i i i i i i i	2018)									Truck Official
4 (2 4 4	490.30 2011) 406.35 406.36 406.38	Superpave Bituminous Concrete Pavement Hand Placed Bituminous Concrete Drives (2018)	490.03 Superpave Bituminous Concrete Pavement	Slip AC Content	< 200 TONS of Mix		Truck Batch Slip Truck @ Plant or on Project <sup>11</sup>	 Dependent on mix type <sup>9</sup>	R 97	Truck Slip Cal T 308, T

					Table 2: Material Sampli	ing Manual Pro	Jject Level 3				?
Ę			uo					<u>ل</u>		P	Procedures
Type of Constructic	Pay Item Number	Pay Item Name	Materials Specificati Number	Material Name	Test	Minor Quantity Threshold	Minimum Acceptano Sampling Frequenc (per project)	Acceptance Samplir Location	Sample Size <sup>(2)</sup>	Sampling	Testing <sup>(1)</sup>
srete	501.32 (2011) 501.33 (2011) 501.34 (2011) 544.10	Concrete, High Performance Class AA (2011) Concrete, High Performance Class A (2011) Concrete, High Performance Class B (2011) Prefabricated Bridge Unit Superstructure	501.03	HPC Structural Concrete	Air Temperature Compressive Strength	< 10 CY	1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible <sup>7</sup>	1 cu ft for Compressive Strength or wheelbarrow needed for all tests	ASTM C172	ASTM C231 ASTM C1064 T 22
PC Structural Conc	501.35	Concrete, SCC	501.03	HPC Structural Concrete	Air Temperature Compressive Strength Spread (SCC)		1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible <sup>7</sup>	1 cu ft for	ASTM C172 R 100 ASTM C172	ASTM C231 ASTM C1064 T 22 ASTM C1611
Ξ	501.36	Concrete, High Performance Class LW	501.03		Air Temperature Compressive Strength Unit weight (for lightweight aggregate only)		1 per 50 CY (See Note 3)		Compressive Strength or wheelbarrow needed for all tests	ASTM C172	ASTM C231 ASTM C1064 T 22 ASTM C173
			704.14	Lightweight Coarse Aggregate for Structural Concrete	Gradation Density	< 80 CY	1 per project 1 per placement	Stockpile at plant Stockpile at plant	See note 8 0.5 to 2 cu ft	R 90 R 90	T 27 T 19
nct as	·	High Performance Concrete, Class PCS	501.03		Air Temperature Compressive Strength Spread (SCC)	< 10 CY		on project, as close to point of deposit as	1 cu ft for	ASTM C172 R 100	ASTM C231 ASTM C1064 T 22 ASTM C173
iteel	506.50 506.55	Structural Steel, Rolled Beam Structural Steel, Plate Girder	714.04	Carbon Steel Bolts, Nuts and Washers	Ultimate Tensile Stress Ultimate Tensile Stress, Wedge Rockwell Hardness		4 - Each combination of bolt production lot, nut lot, washer lot, and DTI lot (4 - Each combination Tension				ASTM F606
uctural S	506.55 506.57 506.60	Structural Steel, Curved Plate Girder Structural Steel, Truss	714.05	High Strength Bolts, Nuts and Washers	Ultimate Tensile Stress Ultimate Tensile Stress, Wedge Rockwell Hardness		connections as designated in the Contract or as defined		n N/A	N/A	ASTM F606
ŝ	506.75		714.06	Heat Treated Structural Bolts	Ultimate Tensile Stress Ultimate Tensile Stress, Wedge Rockwell Hardness		in 714.01, or other connections as deemed necessary by the Resident Engineer.				ASTM F606
ncrete	510.21 510.22	Prestressed Concrete Box Beams Prestressed Concrete Voided Slabs	501.03	HPC Structural Concrete	Air Temperature Compressive Strength		1 per project (See note 5) 1 per project (See note 6) 1 per project (See note 6) 1 per project (See note 6)	At plant, as close to point of deposit as possible	1 cu ft for Compressive Strength or wheelbarrow needed	ASTM C172 R 100	ASTM C231 ASTM C1064 T 22
С д	510.23	Prestressed Concrete Girders			Spread (SCC)		1 per project (See note 6)		for all tests	ASTM C172	ASTM C1611
Prestresse	510.25 510.26 540.10 543.10	Prestressed Concrete Solid Slabs Prestressed Concrete NEXT D Beams Precast Concrete Structure Contractor-Fabricated Precast Concrete Structure		Lightweight Coarse Aggregate for Concrete Mechanical Splices for Bar Reinforcement	Density (lightweight only) Ultimate Tensile Stress		1 per project 3 per size	Stockpile at plant Stockpile at plant/Project (must be fully assembled before delivery to lab)	0.5 to 2 cu ft connector length plus 12 inches of bar on each end	R 90	T 19 T 244
recast/			707.03	Mortar, Type IV	Compression Strength of cubes		1 per placement	Project	3 cubes cast on project	R 64	ASTM C109
ā	510.24	Grouting Shear Keys	707.03	Mortar, Type IV	Compression Strength of cubes		1 per placement	Project	3 cubes cast on project	R 64	ASTM C109

					Table 2: Material Samplir	ng Manual Prc	ject Level 3				
			uc		· · · · · · · · · · · · · · · · · · ·	<u> </u>	<u></u> % >	 D		F	Procedures
Type of Constructio	Pay Item Number	Pay Item Name	Materials Specificatic Number	Material Name	Test	Minor Quantity Threshold	Minimum Acceptanc Sampling Frequenc (per project)	Acceptance Samplin Location	Sample Size <sup>(2)</sup>	Sampling	Testing <sup>(1)</sup>
			501.03	HPC Structural Concrete	Air Temperature Compressive Strength Spread (SCC)		1 per project (See note 5) 1 per project (See note 6) 1 per project (See note 6) 1 per project (See note 6)	<ul> <li>At plant, as close to point of deposit as</li> <li>possible</li> </ul>	1 cu ft for Compressive Strength or wheelbarrow needed for all tests	ASTM C172 R 100 ASTM C172	ASTM C231 ASTM C1064 T 22 ASTM C1611
,			704.14	Lightweight Coarse Aggregate for Concrete	Density (lightweight only)	,	1 per project	Stockpile at plant	0.5 to 2 cu ft	R 90	T 19
.±				Mortar, Type IV	Compression Strength of cubes		1 per placement	Project	3 cubes cast on project	R 64	ASTM C109
3ridge Uni		 	713.01	Bar Reinforcement	Ultimate Tensile Stress Yield Tensile Stress Elongation	. <u></u>	1/grade/source	at plant	6 ft	N/A	T 244
ricated E	544.10	) Bridge Unit Superstructure	713.02	Mechanical Splices for Bar Reinforcement	Ultimate Tensile Stress		3 per size	Stockpile at plant/Project (must be fully assembled before delivery to lab)	connector length plus 12 inches of bar on each end	N/A	T 244
Prefabi		 	714.04	Carbon Steel Bolts, Nuts and Washers	Ultimate Tensile Stress Ultimate Tensile Stress, Wedge Rockwell Hardness		4 - Each combination of bolt production lot, nut lot, washer lot, and DTI lot (4 - Each combination Tension				ASTM F606
ļ		714.05 High Strength Bolts, Nuts a	High Strength Bolts, Nuts and Washers	Ultimate Tensile Stress Ultimate Tensile Stress, Wedge Rockwell Hardness		Control Assembly Bolt production lot if used) to be incorporated into the project for main member connections as designated in the Contract or as defined	Original Manufacturer Shipping Container at the project or at fabrication facility	N/A	N/A	ASTM F606	
		-	714.06	Heat Treated Structural Bolts Tension Control Assemblies	Ultimate Tensile Stress Ultimate Tensile Stress, Wedge Rockwell Hardness Rotational Capacity Test		in 714.01, or other connections as deemed necessary by the Resident Engineer.				ASTM F606 ASTM F3125
	525.11 525.33 525.335 525.34 525.41 525.44	<ul> <li>Bridge Railing, Galvanized 3 Rail Box Beam</li> <li>Bridge Railing, Galvanized 4 Rail Box Beam</li> <li>Bridge Railing, Galvanized HD Steel Beam/Fascia</li> <li>Mounted</li> </ul>	714.07	Anchor Bolts, Bridge Railing	Ultimate Tensile Stress Ultimate Tensile Stress, Wedge		2 - Each combination of anchor bolt production lot, nut lot, and washer lot to be incorporated into the project	Original Manufacturer Shipping Container at the project or at fabrication facility	N/A	N/A	ASTM F606
lling			501.03	HPC Structural Concrete	Air Temperature Compressive Strength Spread (SCC) Unit weight (for lightweight aggregate only)	< 10 CY	1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible <sup>7</sup>	1 cu ft for Compressive Strength or wheelbarrow needed for all tests	ASTM C172 R 100 ASTM C172 ASTM C172	ASTM C231 ASTM C1064 T 22 ASTM C1611 ASTM C173
Ra	525.45	Bridge Railing, Galvanized Steel Tubing/Concrete Combination	704.14	Lightweight Coarse Aggregate for Concrete	Density (for lightweight aggregate only)		1 per placement	Stockpile at plant	0.5 to 2 cu ft	R 90	T 19
Bridge			713.02	Mechanical Splices for Bar Reinforcement	Ultimate Tensile Stress		3 per size	assembled before delivery to lab)	connector length plus 12 inches of bar on each end	N/A	T 244
ļ			714.07	Anchor Bolts, Bridge Railing	Ultimate Tensile Stress		2 - Each combination of anchor bolt production lot, nut lot, and washer lot to be incorporated into the project	Original Manufacturer Shipping Container at the project or at fabrication facility	N/A	N/A	ASTM F606
	525.70	) Bridge Railing, Concrete F-Shape		HPC Structural Concrete	Air Temperature Compressive Strength Spread (SCC) Unit weight (for lightweight aggregate only)	/ <b></b>	1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible <sup>7</sup>	Strength or wheelbarrow needed for all tests	ASTM C172 R 100 ASTM C172 ASTM C172	ASTM C231 ASTM C1064 T 22 ASTM C1611 ASTM C173
		. <u>.</u> .	704.14 713.02	Lightweight Coarse Aggregate for Concrete Mechanical Splices for Bar Reinforcement	Density (for lightweight aggregate only) Ultimate Tensile Stress		1 per placement 3 per size	at plant Stockpile on Project (must be fully assembled before delivery to lab)	0.5 to 2 cu ft connector length plus 12 inches of bar on each end	R 90 N/A	T 19 T 244

					Table 2: Material Sam	pling Manual Projec	ct Level 3				
uo	<u>ر</u>		ion				CC CC	bu			Procedures
Type of Constructi	Pay Item Numbe	Pay Item Name	Materials Specificat Number	Material Name	Test	Minor Quantity Threshold	Minimum Acceptan Sampling Frequen <b>(per project)</b>	Acceptance Sampli Location	Sample Size <sup>(2)</sup>	Sampling	Testing <sup>(1)</sup>
	541.21 541.22 541.25 541.30 541.31	Concrete, Class AA Concrete, Class A Concrete, Class B Concrete, Class C Concrete, Class D	541.03	Structural Concrete	Air Temperature Compressive Strength Unit weight (for lightweight aggregate only)	< 10 CY	1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible <sup>7</sup>	1 cu ft for Compressive Strength or wheelbarrow needed for all tests	ASTM C172 R 100 ASTM C172	ASTM C231 ASTM C1064 T 22 ASTM C173
ete	541.40	Concrete, Class LW	704.14	Lightweight Coarse Aggregate for Structural Concrete	Density (for lightweight aggregate only)		1 per placement	Stockpile at plant	0.5 to 2 cu ft	R 90	T 19
l Concre	[				Air Temperature					ASTM C172	ASTM C231 ASTM C1064
Structura	541.45	Controlled Density (Flowable) Fill	541.03	Structural Concrete	Compressive Strength		1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible <sup>7</sup>	1 cu ft for Compressive Strength or wheelbarrow needed for all tests	ASTM D5971 Molds to be cut and taped prior to filling in accordance with ACI 229, Section 8.4	ASTM D4832
crete Repair	580.10 580.11 580.12	11 Repair of Concrete Superstructure, Class II	541.03 501.03 501.03	Structural Concrete High Performance Structural Concrete (2011) Performance Based Structural Concrete (2018)	Air Temperature Compressive Strength	< 10 CY	1 per 50 CY (See Note 3)	on project, as close to point of deposit as possible <sup>7</sup>	1 cu ft for Compressive Strength or wheelbarrow needed for all tests	ASTM C172 R 100	ASTM C231 ASTM C1064 T 22
	580.13 580.14 580.15	Repair of Concrete Substructure, Class I Repair of Concrete Substructure, Class II Repair of Concrete Substructure, Class III	780.01(b)	Concrete Repair Material, Type I Concrete Repair Material, Type II Concrete Repair Material, Type IV	Compressive Strength		1 per first 25 units, then 1 per 100 units (bags) after	on project, as close to point of deposit as practical	3 cubes cast on project	R 64	ASTM C109
Struc	580.19	Concrete, Class AA Overlay		Concrete Repair Material, Type III	Compressive Strength		1 per first 25 units, then 1 per 100 units (bags) after	on project, as close to point of deposit as practical	1 cu ft for Compressive Strength Cylinders	ASTM C172	ASTM C231
		o Underdrain pipe Underdrain Carrier pipe	704.16	Drainage Aggregate	Gradation	< 600 CY	1 per project	Stockpile on Project	55	R 90	T 27
alks	616.27 616.28 616.45 (2011) 618.10 618.11	<ul> <li>Cast-in-place Concrete Curb, Type A</li> <li>Cast-in-place Concrete Curb, Type B</li> <li>Portland Cement Concrete Gutter (2011) Portland</li> <li>Cement Sidewalk, 5 inch</li> </ul>	541.03	Structural Concrete	Air Temperature	< 10 CY	1 per project	on project, as close to point of deposit as possible <sup>7</sup>	1 cu ft for Compressive Strength or wheelbarrow needed for all tests	ASTM C172	ASTM C231 ASTM C1064
s, and Sid	621.45 (2011)	Concrete Median Barrier (2011)			Compressive Strength					R 100	T 22
sland	616.300		406.032	Bituminous Concrete Pavement	Slip AC Content	< 200 TONS of Mix	1 per project	Truck @ Plant or on Project <sup>11</sup>	Dependent on mix		Truck Slip Calculation
lic	(2011)	Bituminous Concrete Curb Type A (ton) (2011)	+00.03a		Gradation	< 200 TONS of Mix	1 per project	Truck @ Plant or on Project <sup>11</sup>	type <sup>9</sup>	R 97	T 164 or T 308, T 30
Ē	616.305 616.31 (2011) 616.315	Bituminous Concrete Curb Type A (Ift) Bituminous Concrete Curb Type B (ton) (2011) Bituminous Concrete Curb Type B (Ift)	702.04	Emulsified Asphalt	Distillation, Penetration @ 25 °C		1 per project	Distibutor Truck on Project	1 Quart	R 66	T 49, T 59
rbs, (			616.13	Bituminous Concrete Gutters and Traffic Islands	Slip AC Content Gradation	< 200 TONS of Mix < 200 TONS of Mix	1 per project 1 per project	Truck @ Plant or on Project <sup>11</sup> Truck @ Plant or on Project <sup>11</sup>	Dependent on mix	R 97	Truck Slip Calculation T 164 or T 308, T 30
Cul			400.00		Slip AC Content	< 200 TONS of Mix	1 per project	Truck @ Plant or on Project			Truck Slip Calculation
	616.47	Bituminous Concrete Gutters and Traffic Islands	406.03a	Bituminous Concrete Pavement	Gradation	< 200 TONS of Mix	1 per project	Truck @ Plant or on Project <sup>11</sup>		R 97	T 164 or T 308, T 30
	618.15	Bituminous Concrete Sidewalk		Superpave Bituminous Concrete Pavement (2011) ) Bituminous Concrete Pavement (2018)	Slip AC Content	< 200 TONS of Mix	1 per project 1 per project	Truck @ Plant or on Project <sup>11</sup> Truck @ Plant or on Project <sup>11</sup>	Dependent on mix type <sup>9</sup>	 R 97	Truck Slip Calculation T 164 or T 308, T 30

				Table 2: Material Sam	billig Walluar Pro	oject Level 5			1	Procedures
Pay Item Number	Pay Item Name	Materials Specification Number	Material Name	Test	Minor Quantity Threshold	Minimum Acceptance Sampling Frequency (per project)	Acceptance Sampling Location	Sample Size <sup>(2)</sup>	Sampling	Testing (1)
675.41 (18	Foundation for W-Shape Steel Post 18 (2011), 24, 30 inch diameter) Foundation for Tubular Steel Post	541.03	Structural Concrete	Air Temperature Compressive Strength	< 10 CY	1 per project	on project, as close to point of deposit as possible <sup>7</sup>	1 cu ft for Compressive Strength or wheelbarrow needed for all tests	ASTM C172 R 100	ASTM C ASTM C T 22
Overhead Traffic Sign Support, Cantilever677.12Overhead Traffic Sign Support, Multi-Support677.13Overhead Traffic Sign Support, Cantilever with677.24Lighting677.25Overhead Traffic Sign Support, Multi-support with677.25Remove and Reset Overhead Traffic Sign678.15Support679.46Traffic Control Signal System, Intersection	Overhead Traffic Sign Support, Multi-Support	541.03	Structural Concrete	Air Temperature Compressive Strength	< 10 CY	1 per 75 CY (See Note 4)	on project, as close to point of deposit as possible <sup>7</sup>	1 cu ft for Compressive Strength or wheelbarrow needed for all tests	ASTM C172 R 100	ASTM C ASTM C T 22
	714.05	High Strength Bolts, Nuts and Washers	Ultimate Tensile Strength Ultimate Tensile Strength, Wedge Rockwell Hardness		4 - Each combination of bolt production lot, nut lot, washer lot, and DTI lot (4 - Each combination Tension Control Assembly Bolt production lot if used) to be	Original Manufacturer Shipping Container		N/A -	ASTM F	
	714.06	Heat Treated Structural Bolts	Ultimate Tensile Strength Ultimate Tensile Strength, Wedge Rockwell Hardness		incorporated into the project for main member connections as designated in the Contract or as defined in 714.01, or other connections as deemed necessary	at the project or at fabrication facility			ASTM F	
Street Light Assembly								1 holt including		
		714.09 ise noted.	Anchor Bolts, Traffic Signals, Lighting, and Overhead Sign Structures (see note 10)	Ultimate Tensile Strength		1 - Each anchor bolt production lot to be incorporated into the project. Include washer and nut with sample.	Original Manufacturer Shipping Container at the project or at fabrication facility	1 bolt, including threads (at least 18" long)	N/A	ASTM I
<ol> <li>Testing pri</li> <li>Sample siz</li> <li>Total place</li> <li>Total place</li> <li>Total place</li> <li>applicable tes</li> <li>Temperatu</li> <li>Acceptance</li> <li>Acceptance</li> <li>Acceptance</li> <li>Acceptance</li> <li>The sample</li> <li>Depends u</li> <li>The sample</li> <li>The sample</li> <li>Acceptance</li> </ol>	procedures are AASHTO procedures unless otherwisize is in pounds unless otherwise noted. The sample cement for day split into equal sublots not to exceed ecification then the Contractor must test each conservent method. Acceptance tests for 541.40 Concrete, ature and air content will be checked at the begining ince tests are to be performed by Owner representation is stripped and then standard cured.	ise noted. le size shoud 50 CY, te ecutive load Class LW of the first tive at the fing truck how /8" stone the um aggrega nd ticket. c signal con	Overhead Sign Structures (see note 10) uld be selected based on the maximum nominal ag st yardage chosen randomly. The test yardage is d until 3 consecutive passing loads are tested. VT shall be a minumum of 3 standard cured cyinder s load. This will not be counted as the acceptance to frequency indicated, per project. However, all QC requency indicated, per project. However, all QC to se at the point of placement (i.e. without retracting he sample size is 165 lbs, 55 lbs, and 22 lbs respe- ate in the mix, see following table. Minimum sample introllers and cabinets or pedestal poles.	ggregate size (See AASHTO T27, Section 7.1 used to determine which load to test with prop rans will check 4th consecutive load to verify. speciments in accordance with applicable test tests. tests are to be witnessed by Owner representa the hose from within formwork), the sample s ctively. le sizes are in accordance with AASHTO T168	ber sample collection Deck pours shall hav method. ative. Minimum of si tive. As a minimum hould be obtained fro and are suitable for	into the project. Include washer and nut with sample. e material visually passes a 2", 1.5", or 1" sieve then the sam n techniques followed Check first load for temperature, and a ve no less than 3 acceptance tests, regardless of total CY pla ix Compressive Strength for determining detensioning, to be n, the first load as well as the load that the Compressive Stren	at the project or at fabrication facility nple size is 220 lbs, 165 lbs, and 110 lbs, res air content. This will not be counted as the a laced. Acceptance tests shall be a minimum of e cured with the piece. Four specimens to de ngth are fabricated from should be tested by	threads (at least 18" long) spectively. acceptance test for the of 2 standard cured cyl etermine 28 day and sh	first sublot. If th linder specimens	e first load is de in accordance v and are to be cu
<ol> <li>(1) Testing pri</li> <li>(2) Sample si:</li> <li>(3) Total place</li> <li>be out-of-special</li> <li>applicable tess</li> <li>(4) Temperature</li> <li>(5) Acceptance</li> <li>(6) Acceptance</li> <li>(7) If the same</li> <li>(8) Depends ut</li> <li>(9) The sample</li> <li>mass (weight)</li> <li>(10) Acceptance</li> <li>(11) Bituminou</li> <li>(12) For proje</li> </ol>	procedures are AASHTO procedures unless otherwisize is in pounds unless otherwise noted. The sample cement for day split into equal sublots not to exceed ecification then the Contractor must test each conservest method. Acceptance tests for 541.40 Concrete, ature and air content will be checked at the begining ince tests are to be performed by Owner representations stripped and then standard cured. Ince tests are to be performed by Owner representations are tests are to be performed by Owner representations are tests are to be performed by Owner representations are tests are to be performed by Owner representations are tests are to be performed by Owner representations are tests are to be performed by Owner representations are tests are to be performed by Owner representations are testing is not required for anchor bolts for traffic ous mixtures sampled on project shall be sampled figures less than 1250 CY of subbase material, the Ag	ise noted. le size shoud 50 CY, te ecutive load Class LW of the first tive at the first tive at the finp truck houd /8" stone the um aggregand ticket. c signal course from the pa- gency shall	Overhead Sign Structures (see note 10) uld be selected based on the maximum nominal ag st yardage chosen randomly. The test yardage is d until 3 consecutive passing loads are tested. VTF shall be a minumum of 3 standard cured cyinder s load. This will not be counted as the acceptance to frequency indicated, per project. However, all QC requency indicated, per project. However, all QC to se at the point of placement (i.e. without retracting he sample size is 165 lbs, 55 lbs, and 22 lbs respe- ate in the mix, see following table. Minimum sample introllers and cabinets or pedestal poles. Ver hopper, material transfer vehicle hopper, or th be responsible for the testing and projects over 12 ptance testing occuring at a minimum frequency of	ggregate size (See AASHTO T27, Section 7.1 used to determine which load to test with prop rans will check 4th consecutive load to verify. speciments in accordance with applicable test tests. tests are to be witnessed by Owner representa the hose from within formwork), the sample s ctively. le sizes are in accordance with AASHTO T168 e paver auger in accordance with AASHTO T168 250 CY the Contractor is responsible for the de f 1/3,000 Tons of mix. Acceptance testing ma	per sample collection Deck pours shall hav method. ative. Minimum of si tive. As a minimum hould be obtained fro and are suitable for 97. etermination of the ta y occur at the 1/1,50	into the project. Include washer and nut with sample. e material visually passes a 2", 1.5", or 1" sieve then the sam in techniques followed Check first load for temperature, and a vie no less than 3 acceptance tests, regardless of total CY pla ix Compressive Strength for determining detensioning, to be in, the first load as well as the load that the Compressive Stren- rom the mixer truck. r routine testing. However, actual sample size is dependent u arget density. For each source, subbase materials shall be sa 00 Tons of mix sampling frequency at the discretion of the HM	at the project or at fabrication facility nple size is 220 lbs, 165 lbs, and 110 lbs, res air content. This will not be counted as the a laced. Acceptance tests shall be a minimum of e cured with the piece. Four specimens to de ngth are fabricated from should be tested by upon the type and number of tests to which the sampled and tested once for the first 1250 CY MA Materials Manager.	threads (at least 18" long) spectively. acceptance test for the of 2 standard cured cyl etermine 28 day and sh v QC. the material is to be sub	first sublot. If th linder specimens ipping strengths bjected. AC Cont 3000 CY thereaf	e first load is de in accordance and are to be c tent is determine
<ul> <li>(1) Testing pri</li> <li>(2) Sample siz</li> <li>(3) Total place</li> <li>be out-of-special</li> <li>applicable tess</li> <li>(4) Temperatu</li> <li>(5) Acceptance</li> <li>(6) Acceptance</li> <li>(7) If the same</li> <li>(8) Depends u</li> <li>(9) The samplimass (weight)</li> <li>(10) Acceptance</li> <li>(11) Bituminou</li> <li>(12) For proje</li> </ul>	procedures are AASHTO procedures unless otherwisize is in pounds unless otherwise noted. The sample cement for day split into equal sublots not to exceed ecification then the Contractor must test each conservest method. Acceptance tests for 541.40 Concrete, ature and air content will be checked at the begining ince tests are to be performed by Owner representations stripped and then standard cured. Ince tests are to be performed by Owner representations are tests are to be performed by Owner representations are tests are to be performed by Owner representations are tests are to be performed by Owner representations are tests are to be performed by Owner representations are tests are to be performed by Owner representations are tests are to be performed by Owner representations are testing is not required for anchor bolts for traffic ous mixtures sampled on project shall be sampled figures less than 1250 CY of subbase material, the Ag	ise noted. le size shoud 50 CY, te ecutive load Class LW of the first tive at the first tive at the finp truck houd /8" stone the um aggregand ticket. c signal course from the pa- gency shall	Overhead Sign Structures (see note 10) uld be selected based on the maximum nominal ag st yardage chosen randomly. The test yardage is d until 3 consecutive passing loads are tested. VTF shall be a minumum of 3 standard cured cyinder s load. This will not be counted as the acceptance to frequency indicated, per project. However, all QC requency indicated, per project. However, all QC to se at the point of placement (i.e. without retracting he sample size is 165 lbs, 55 lbs, and 22 lbs respe- ate in the mix, see following table. Minimum sample introllers and cabinets or pedestal poles. Ver hopper, material transfer vehicle hopper, or th be responsible for the testing and projects over 12 ptance testing occuring at a minimum frequency of	ggregate size (See AASHTO T27, Section 7.1 used to determine which load to test with prop rans will check 4th consecutive load to verify. speciments in accordance with applicable test test. tests are to be witnessed by Owner represent the hose from within formwork), the sample s ctively. le sizes are in accordance with AASHTO T168 e paver auger in accordance with AASHTO R 250 CY the Contractor is responsible for the de	ber sample collection Deck pours shall hav method. ative. Minimum of si tive. As a minimum hould be obtained fr and are suitable for 97.	into the project. Include washer and nut with sample. e material visually passes a 2", 1.5", or 1" sieve then the sam in techniques followed Check first load for temperature, and a ve no less than 3 acceptance tests, regardless of total CY pla ix Compressive Strength for determining detensioning, to be in, the first load as well as the load that the Compressive Stren- rom the mixer truck. r routine testing. However, actual sample size is dependent u arget density. For each source, subbase materials shall be sa	at the project or at fabrication facility nple size is 220 lbs, 165 lbs, and 110 lbs, res air content. This will not be counted as the a laced. Acceptance tests shall be a minimum of e cured with the piece. Four specimens to de ngth are fabricated from should be tested by upon the type and number of tests to which the sampled and tested once for the first 1250 CY	threads (at least 18" long) spectively. acceptance test for the of 2 standard cured cyl etermine 28 day and sh v QC. the material is to be sub	first sublot. If th linder specimens	in accordance v and are to be cu tent is determine
<ul> <li>(1) Testing pri</li> <li>(2) Sample siz</li> <li>(3) Total place</li> <li>be out-of-special</li> <li>applicable tess</li> <li>(4) Temperatu</li> <li>(5) Acceptance</li> <li>(6) Acceptance</li> <li>(7) If the same</li> <li>(8) Depends u</li> <li>(9) The samplimass (weight)</li> <li>(10) Acceptance</li> <li>(11) Bituminou</li> <li>(12) For proje</li> </ul>	procedures are AASHTO procedures unless otherwisize is in pounds unless otherwise noted. The sample cement for day split into equal sublots not to exceed ecification then the Contractor must test each conservest method. Acceptance tests for 541.40 Concrete, ature and air content will be checked at the begining ince tests are to be performed by Owner representations stripped and then standard cured. Ince tests are to be performed by Owner representations are tests are to be performed by Owner representations are tests are to be performed by Owner representations are tests are to be performed by Owner representations are tests are to be performed by Owner representations are tests are to be performed by Owner representations are tests are to be performed by Owner representations are testing is not required for anchor bolts for traffic ous mixtures sampled on project shall be sampled figures less than 1250 CY of subbase material, the Ag	ise noted. le size shoud 50 CY, te ecutive load Class LW of the first tive at the first tive at the finp truck houd /8" stone the um aggregand ticket. c signal course from the pa- gency shall	Overhead Sign Structures (see note 10) uld be selected based on the maximum nominal ag st yardage chosen randomly. The test yardage is d until 3 consecutive passing loads are tested. VTF shall be a minumum of 3 standard cured cyinder s load. This will not be counted as the acceptance to frequency indicated, per project. However, all QC requency indicated, per project. However, all QC to se at the point of placement (i.e. without retracting he sample size is 165 lbs, 55 lbs, and 22 lbs respe- ate in the mix, see following table. Minimum sample introllers and cabinets or pedestal poles. Ver hopper, material transfer vehicle hopper, or th be responsible for the testing and projects over 12 ptance testing occuring at a minimum frequency of	ggregate size (See AASHTO T27, Section 7.1 used to determine which load to test with prop rans will check 4th consecutive load to verify. speciments in accordance with applicable test test. tests are to be witnessed by Owner represent the hose from within formwork), the sample s ctively. le sizes are in accordance with AASHTO T168 e paver auger in accordance with AASHTO T168 250 CY the Contractor is responsible for the do f 1/3,000 Tons of mix. Acceptance testing ma rpe: MS	per sample collection Deck pours shall hav method. ative. Minimum of si tive. As a minimum hould be obtained fro and are suitable for 97. etermination of the ta y occur at the 1/1,50	into the project. Include washer and nut with sample. e material visually passes a 2", 1.5", or 1" sieve then the sam in techniques followed Check first load for temperature, and a vie no less than 3 acceptance tests, regardless of total CY pla ix Compressive Strength for determining detensioning, to be in, the first load as well as the load that the Compressive Stren- rom the mixer truck. r routine testing. However, actual sample size is dependent u arget density. For each source, subbase materials shall be sa 00 Tons of mix sampling frequency at the discretion of the HM	at the project or at fabrication facility nple size is 220 lbs, 165 lbs, and 110 lbs, res air content. This will not be counted as the a laced. Acceptance tests shall be a minimum of e cured with the piece. Four specimens to de ngth are fabricated from should be tested by upon the type and number of tests to which the sampled and tested once for the first 1250 CY MA Materials Manager.	threads (at least 18" long) spectively. acceptance test for the of 2 standard cured cyl etermine 28 day and sh v QC. the material is to be sub	first sublot. If th linder specimens ipping strengths bjected. AC Cont 3000 CY thereaf	e first load is det in accordance v and are to be cu tent is determine fter.

# MATERIAL SAMPLING FREQUENCY TABLES – LEVEL 4

The acceptance of the materials and corresponding pay items identified in the table below can be based on an approved source, registration on the Agency's Approved Products List (APL), acceptable material test results, or compliant material certifications (submitted prior to their use). The Agency Representative should ensure that these material certifications and test results are filed appropriately.

Applicable sections of the VTrans Standard Specifications for Construction referenced below are included in the chart in bold type.

Material Identification	VTrans Pay Item No.	<b>Recommended Basis for Acceptance</b>			
Aggregates	varies	One sample per project is required for each material that possesses a quantity greater than 200 CY.			
Bridge Membranes		Contract Special Provisions			
Culverts (Steel and HDPE)	601	Purchasing Contract – must satisfy material specifications in accordance with <b>710</b> and <b>711</b> .			
Cast-in-Place Culvert Liners		Contract Special Provisions or APL			
Epoxies		APL			
Hot Mix Asphalt	400 series	Purchasing Contract – Contractor's Test Results. (Reference Table 406.03I in 2018 Standard Specifications for Construction for Air Voids, Mix Temperature, and Extracted Gradations.) An Agency Approved Mix Design and batch slips are required.			
Precast Concrete Items	varies	Purchasing Contract – Type A Certification with Contractor's Test Results. An Agency Approved Mix Design is required.			
Reinforcing Steel		Type D Certification			
Retroreflective Pavement Markings	646	Must satisfy material specification requirements in Section <b>708</b>			
Structural Bolts	506.19	Type D Certification —- 714.05			
Structural Concrete	501, 541	Purchasing Contract – Contractor's Test Results. (28-day Compression strength and entrained air) An Agency Approved Mix Design and batch slips are required.			
Traffic Barriers	621	Must satisfy material specification requirements in Section <b>728</b>			
Traffic Signal Equipment	678	Must satisfy material specification requirements in Section <b>752</b>			
Traffic Signs	675	Must satisfy material specification requirements in Section <b>750</b>			

Table 3

# MARKING OF SAMPLES

All samples that are to be tested at the Agency's Central Laboratory or other Qualified Laboratories must be properly identified with a sample card, sample tag, or printed label. Sample identification should be completed **with all the indicated information** and attached to the sample container immediately after the sample is taken. Sample identification should be attached in a manner which will prevent their loss or damage during handling and transport. The individual receiving the sample at the laboratory shall date and initial the sample identification immediately upon receipt.

#### Sample tags should be made out as indicated below.

Please clearly indicate the Site Manager Project Line Item for the sampled material on the card. Examples of where this information can be documented are included below.

A=Acceptance I=Investigative	LABORATORY NO Project Name Name of Pay Item Material Name Quantity Rep Sampled by (Print Name) (13) Sample Type: A= I= Sample Source	(5) (7) (9) (11)	Type (14) (In-Place, Stockpile, Pi	Line Item No	(4) (6) (8) (10)
TA 178A Rev. 5M 04/00	Material Source Ident. No (Release, Lot, Cert Comments	(Location on Project, Plant Name, etc.) (17) (Supplier, Producer, manufacturer, etc.) (18) .) (21) of sample represented by this card (3 reba	·	(19) son Sample?	D Ref No(20)

# SAMPLE TAG EXAMPLE

# **INSTRUCTIONS FOR SAMPLE TAGS**

- (1) To be entered by Central Laboratory personnel.
- (2) To be entered by Central Laboratory personnel.
- (3) Enter the project name.
- (4) Enter the project number.
- (5) The pay item name, e.g., bituminous concrete pavement, subbase of gravel, structural steel.
- (6) The number that coincides with the pay item name.
- (7) The name of the material being submitted, e.g., asphalt cement, stone grits. "Type" is for hot-mix and reinforcing steel.

- (8) The specification number assigned to the material submitted (normally a 700 series number.)
- (9) The project quantity, including units, that the sample represents, e.g., gal., cwt, yd<sup>3</sup>, tons.

(10) Enter the Site Manager Project Line Item number. Enter Work Package number for Design-Build projects.

- (11) The first and last name of the person taking the sample should be printed followed by their signature. District personnel should include their district number. Personnel outside of the VTrans should identify their organization.
- (12) The date the sample was taken.
- (13) Check appropriate box for type of sample being submitted, e.g., Acceptance or Investigative.
- (14) The construction location where the sample was obtained, e.g., stockpile, tank, transport, paver, roadway.
- (15) Time and condition sample was taken.

(16) The supplier and location where the sample was obtained, e.g., station and offset on the project, Pike - Berlin, Barker Steel.

- (17) The name of the manufacturer, producer, or owner of the pit / quarry where the material originated. For rebar samples both the supplier and manufacturer should be specified.
- (18) Enter any available identifying number, e.g., release number, certification number, heat number.

(19) Check this box when an Independent Assurance sample is simultaneously taken with an Acceptance sample.

(20) Number used to cross-reference Independent Assurance samples with Acceptance samples. This number is assigned by VTrans' Independent Assurance personnel

(21) Enter special information or notes applicable to the sample, e.g., reinforcing steel grade and release number, hot mix AC content, temperature, etc.

				Y OF TRANSP		N			
MATERIALS AND RESEARCH SECTION REPORT ON SAMPLE OF PORTLAND CEMENT / POZZOLAN									
Proj. Name		(1)			Proj. No.	(1)			
Lab. No	(2)	I.D. 1	Marks	(3)	Quant. Re	epresented	(4)		
Name	(5)				Pay Item	(6) Ty	pe (7)		
Sample/Submitt	ed By	(8)	Title	(8)	Т	ested By	(9)		
Sampled	(10)	Received	(11)	Tested	(12)	Reported	(13)		
Date Ground	(14)			Resident		(15)			
Sample From		(16)		Plant		(17)			

Source	(18)		•
Location Used/To Be Used	(19)	Exam. For (20)	

# SAMPLE CARD FOR PORTLAND CEMENT AND POZZOLAN, DESCRIPTION OF ENTRIES

- (1) Project name(s) and number(s) represented by the cement or pozzolan sample.
- (2) Entered by technician at the Central Laboratory.
- (3) The kind of sample: Acceptance, Investigative, Verification or IA.
- (4) Cubic yards of concrete represented by the cement, pozzolan, or mortar sample.
- (5) Name of the cementitious product you are submitting; e.g., Portland cement, Fly Ash, Blended Cement, Tercem, Slag, Mortar Type IV
- (6) Pay item number in which the cementitious material or grout is used.
- (7) Type of cement, pozzolan, or mortar. Use Roman Numerals and pozzolan descriptor; e.g., I/II or II for Portland cement, II/SF for blended cement, II/SF/Slag for Tercem, FA for Fly Ash, and S for Slag, IV for Mortar Type IV.
- (8) First and last name and employer of person submitting sample.
- (9) Name of Central Laboratory technician testing the sample.
- (10) Date sample was taken.
- (11) Date sample was received at Central Laboratory.
- (12) Date sample was tested. Entered by Technician at the Central Laboratory.
- (13) Date sample test results were reported. Entered by Technician at the Central Laboratory.
- (14) Use this space to enter the Sitemanager Line Item number, or Work Package number for Design-Build projects.
- (15) Name of the Resident Engineer.
- (16) Location where the sample was obtained; e.g., weigh hopper, silo, Bucket loader, Tanker. Or for mortars; mixer, wheelbarrow, etc.
- (17) Ready mix producer's name and plant location. Applicable for plant-mixed mortars, not applicable for bagged products.
- (18) Name of cement, pozzolan, or mortar manufacturer, i.e., plant source/location, or Brand and product name, i.e. Sika Grout 212.
- (19) Location where concrete or mortar is to be used; e.g., bridge abutment, footing.
- (20) Materials specification number for which the sample is to be tested; e.g., 701.02. 707.03

For cement/pozzolan samples, the reverse of the card is not filled out by sampler.

For mortar samples, the reverse side of the card is used to indicate the desired age of breaks for the cubes.

**C** • 1

#### REPORT ON CONCRETE TEST BEAMS OR CYLINDERS

A. Front Side:										
Laboratory No		.(0)								
Pay Item Name	(1)	)				Pay Item No		(2)		
Material Name	(3)	)		Class	(4)	Material Spec	2. No	. (5)		
Quantity Rep										
Sample Type         V         A         I         IA         (9)         Sampled From(10)										
Material Source										
Project Name(12)										
Resident										
Comparison Samp										
Location Used										
Fine Aggregate	(20).			1	otal Aggreg	ate Dry Mass	(Wgt.)	(21)	•••••	
Cement Brand(22)										
Air Entraining Ac	mixture	(25)		······	!					
Admixture		(27)		······		Dosage				
Admixture	••••••	(27)	•••••	······	I	Dosage		.(28)		
		resh Concreto (32) w/	,	,	Air	× /		1	,	
Specimen No.	Cyl	Date Received	Date Broken	Desired Age At Break	Age at Break	Hour of Break	Cure Type S/F *	Indiv. Break	Avg. Break	
S				(37)			(38)			
	* S = Standard Cure F = Field Cure									
				Comm	ents:	(39)				

#### **Description of fields in the:**

### **REPORT ON CONCRETE TEST BEAMS OR CYLINDERS**

#### A. Front Side:

- (0) Line Item number, or Work Package number for Design-Build projects.
- (1) Pay item name, e.g., Concrete, Class B.
- (2) Pay item number, e.g., 501.25, 616.27, etc.
- (3) Material name, e.g., Portland cement concrete, silica fume concrete, etc.
- (4) Class of concrete, e.g., AA, A, B, HPC-A etc..
- (5) Specification reference for the specimen to be tested, e.g., 2011 VTrans Standard Specifications for Construction, Table 501.03A for cylinders

- (6) Cubic yards of concrete represented by test specimens.
- (7) The date the sample was taken.
- (8) The time the sample was taken, using "military 24 hour time", e.g., 0845, 1420, etc.
- (9) Check appropriate box for type of sample being submitted. See definitions, page 7.
- (10) The location where the sample was obtained, e.g., truck, bucket, pump, etc. (Include truck number and/or load number.)
- (11) Name and location of ready-mix plant.
- (12) Project name that the sample applies to.
- (13) Project number assigned to the project name.
- (14) Print first initial and last name of the Resident Engineer assigned to the project.
- (15) Print first initial and last name of person performing field tests and molding concrete test specimens.
- (16) Check this box when an Independent Assurance sample is taken simultaneously with an Acceptance sample.
- (17) Number used to cross-reference Independent Assurance samples with Acceptance samples. Assigned by Central Laboratory Personnel.
- (18) Entered by Central Laboratory personnel.
- (19) Specific part(s) of structure represented by test specimens, e.g., abutment, wingwall, drop inlet covers etc. Maximum of 40 characters.
- (20) Name and location of coarse aggregate supplier and fine aggregate supplier.
- (21) Total dry weight of coarse and fine aggregate per cubic yard in pounds.
- (22) The name of the cement manufacturer.
- (23) Type of cement.
- (24) Pounds of cement per cubic yard.
- (25) Enter brand name of air entraining admixture, e.g., Microair, Darex II, etc.
- (26) Volume in fluid ounces per cubic yard of concrete or per cwt of cementitious material.
- (27) Enter brand name of other admixture(s), e.g., WRDA Hycol, Pozzolith 322N, Daratard 17, fly ash, ground granulated blast furnace slag, etc.
- (28) Volume in fluid ounces per cubic yard of concrete or per cwt of cementitious material for chemical admixtures. Weight per cubic yard of concrete for mineral admixtures.

# **B. Back Side:**

- (29) Unit weight of fresh concrete in pcf.
- (30) Air content of fresh concrete in percent (to nearest 0.1%), e.g., 4.5, 5.7.
- (31) Slump to the nearest nearest 0.25 inch, e.g., 2.25 in.
- (32) Total gallons of water used per cubic yard including water batched, water added on project site and free aggregate moisture.

- (33) Water / cementitious material ratio. Total amount of water in gallons per cubic yard multiplied by 8.345 lb. /gal., divided by the weight of cementitious material in lbs. per cubic yard.
- (34) Concrete temperature in degrees Fahrenheit.
- (35) Ambient temperature in the shade at the project site in degrees Fahrenheit.
- (36) Specimen identification number (six characters maximum).
- (37) Desired age at which specimens are to be tested.
- (38) "S" for standard cured or "F" for field cured.
- (39) Other information regarding test specimens. Thirty-five characters maximum, e.g., frozen specimens, etc

#### SAMPLE CARD EXAMPLES

D	LABORATORY NO Project Name <u>Guilford</u> Name of Pay Item <u>Sublance</u> of <u>Crusted</u> <u>Gravel</u> , <u>Fine Graded</u> Material Name <u>Crusted</u> <u>Gravel</u> <u>Por Subbase</u> <u>Type</u> Quantity Rep	Date Rcv'd @ Lab. / / / Project No. $\underline{IM}  091 - 1(33)$ Pay Item No. $\underline{301.26}$ Mat. Spec. No. $\underline{704.05}$
	Sampled by (Print Name)       John       Doc         Sample Type: A= $[A = [A]]$ Where Sampled       In Place         Sample Source       Start And	Line Item No
	Material Source Cersosimo - Bemis Quarry, (Supplier, Producer, manufacturer, etc.)	n Sample? X-Ref No

Aggregate Sample Card

LABORATORY NO.	
	Date Rcv'd @ Lab///
Project Name	Project No. FEGC 019-4(20)
Name of Pay Item EMULSIFIED ASPHALT	Pay Item No 404 . 65
Material Name EMULSIFIED ASPHALT Type RS-1	Mat. Spec. No. 702.04
Quantity Rep. 200 CWT	Line Item No. 0075
Sampled by (Print Name) JOHN DOE	Date Sampled 10/15/17
Sample Type: A= / I= Where Sampled TRuck	Time 14:02
Sample Type: A= [] I= [] Where Sampled <u></u> (In-Place, Stockpile, Pit, Sample Source <u>Sta 160+00</u> O/S (SBShowde) (Location on Project, Plant Name, etc.)	, Truck, etc.) Tank
(In-Place, Stockpile, Pit,	, Truck, etc.) Tank Time_14:02 No.(07 # 36
(In-Place, Stockpile, Pit, Sample Source Sta 160+00 O/S (SBShowide) (Location on Project, Plant Name, etc.) Material Source MOHAWK ASPHALT EMMISTONS (Supplier, Producer, manufacturer, etc.)	, Truck, etc.) Tank
(In-Place, Stockpile, Pit, Sample Source Sta 160+00 O/S (SBShoulde) (Location on Project, Plant Name, etc.) Material Source MOHAWK ASPHALT EMULSTONS (Supplier, Producer, manufacturer, etc.)	No.(_ <u>○</u> <u>₩</u> _36

# Emulsion Sample Card

LABORATORY NO	Date Rcv'd @ Lab. / /					
Project Name Butland - 16: 11ing ton	Project No. ERNH 020-2(36)					
Name of Pay Item Superpave Bituminous Concrete Pavement	Pay Item No. 490.30					
Material Name Performance Graded Asphalt Binder Type 70-28	Mat. Spec. No. 702.02					
Quantity Rep. 1000 Tons	Line Item No					
Sampled by (Print Name) Glenn Porter	Date Sampled 05/04/17					
Sample Type: A= 1= Where Sampled In Line	★ 1 Time_15:00					
(In-Place, Stockpile, Pit, Sample Source Wilk Paving Inc Center Butland, (Location on Project, Plant Name, etc.)						
Material Source Parco - Athens, NY (Supplier, Producer, manufacturer, etc.)	No					
Ident. No. Lot 12PG 70-28 MODIComparison Sample? X-Ref No						
Comments						
(size of sample represented by this card (3 rebar @ 5 ft each, 2 cans @ 1 pi	nt each, etc.) and any other pertinent information)					

Performance Graded Binder Sample Card

**Note For PG Binder Samples:** In addition to the information required on the sample tag, be sure to include the combined aggregate bulk specific gravity, the mix design number, the load slip number, the computed slip asphalt content, the mix temperature, the asphalt specific gravity, the time batched and the test number. **Do not use the sample container as a sample tag.** 

Bituminous Concrete Pavement Sample Card

LABORATORY NO.	Date Rcv'd @ Lab	
Project Name MANCHESTER-BUTLAND TOWN	Project No. MH Su	RF (50)
Name of Pay Item SUPERPANE BETUMENELS CONCRETE PAVEMEN	TPay Item No	90.30
Material Name <u>Superpare</u> Type <u>IV</u>	Mat. Spec. No	90.03
Quantity Rep. 20,85 TONS	Line Item No(	)330
Sampled by (Print Name) JOHN DOE	Date Sampled 05	119 117
Sample Type: A= 1 I= Where Sampled FBOM PAVER	Truck, etc.)	Time 14:00
Sample Type: A= I= Where Sampled FBOM PAVER (In-Place, Stockpile, Pit, Sample Source STA 104+00 BT (Location on Project, Plant Name, etc.)	Truck, etc.) Tanl	
(In-Place, Stockpile, Pit,		
(In-Place, Stockpile, Pit, Sample Source <u>STA 104+00 RT</u> (Location on Project, Plant Name, etc.) Material Source <u>PECKHAM - SHAFTSBURY</u> (Supplier, Producer, manufacturer, etc.)		6-850
(In-Place, Stockpile, Pit, Sample Source STA 104+00 RT (Location on Project, Plant Name, etc.) Material Source <u>PECKHAM - SHAFTSBWRY</u> (Supplier, Producer, manufacturer, etc.) Ident, No.	No. <u>SP</u>	( <u> </u>

TA 1820 Rev. 1M 4-92	VERMONT AGE	NCY OF TRANSPORTATION
	MATERIALS A	ND RESEARCH DIVISION
	MONTPEL	IER, VERMONT 05633
	REPORT ON CONCRE	ETE TEST BEAMS OR CYLINDERS
Laboratory No		
Pay Item Name	CONCRETE, HIGH	PERFOMANCE Pay Item No. 501,34
	CONCRETE, H.P.	
		mpled 211109 Time Sampled 12:00PM
		ample From LOAD ? TRK?
	PLANT NAME ,	
	BRADFORD	NO STP 9602 (33)
Resident	-	Field Tested By JAKE SMITH
Comparison San	nple 🗌 X-Ref No	Lab Tested By
Location Used	FOOTING	Coarse Aggregate (Supput)
Fine Aggregate_	(SUPPLIER)	Total Aggregate Wgt. 2732
Cement Brand	(MANUFACTURER)	
Air Entraining Ad	Imixture Are	Dosage 3.5 02/4
Admixture		
Admixture	RETARDER	
	FIY ASH	DOSAGE 50 Losicy
	SILCAFUN	NE POSAGE 25 Ibs/cy

Front of Concrete Cylinder Sample Card

Unit Weight F Total Water		w/c Rat							
Specimen No.	Cyl pcf	Date Received	Date Broken	Desired Age at Break	Age At Break	Hour of Break	Cure Type S/F*	Indiv. Break psi	Avg. Break psi
AZA-I					7				
A2A-2					7				
A2A-3					14.				
AZA-4					14				
AZA-S					28				
A2A-6					28				
				· ·					

Back of Concrete Cylinder Sample Card

	LABORATORY NO	Date Rcv'd @ Lab. / /
-	Project NameStock bridge	Project No. STP 13RF 013-4(21)
0	Name of Pay Item Structural Steel, Truss	Pay Item No. 506 . 57
	Material Name High Strength Bolts, Washers Type III	Mat. Spec. No. 714 . 05
	Quantity Rep 1,000 165	Line Item No. 0305
2	Sampled by (Print Name) John Doe	Date Sampled 06 /07 / 18
2	Sample Type: A= I I= Where Sampled Stackpile	Truck, etc.) Tank
		Laskr, PA
1	Material Source House of Threads, Pottstown (Supplier, Producer, manufacturer, etc.)	<u>PA</u> No
	Ident. No. 7/8" 2 1/4 Block Compariso	Sample? X-Ref No
	Comments Set of (4) bolt, nut, weisher, DTI Bolt Lot# 23	57858 NUT Lot# 2394394 DTI Lot#
	(size of sample represented by this card (3 rebar @ 5 ft each, 2 cans @ 1 pi	nt each, etc.) and any other pertinent information) 7855469

Bolts/Washers/Nuts Sample Card

	LABORATORY NO.	Date Rcv'd @ Lab. / /
	Project Name_Johnson	Project No. BF 0248(4)
,	Name of Pay Item Rein Porcing Steel, Level III	Paulton No 507 18
	Material Name Bar BeinBreement Typestanles	s Mat. Spec. No. 713.01(P)
	Quantity Rep. 1000 (16)	Line Item No. 0220
	Sampled by (Print Name) John Doc	Date Sampled 02 / 09 / 18
)	Sample Type: A= I I= Where Sampled 14 Place	Truck, etc.) Tank
	Sample Source CN_ Project Flant Name, etc.)	
	Material Source <u>Rencker</u> Steel (Supplier, Producer, manufacturer, etc.)	No
	Ident. No#8 heat # 611/0216 Compariso (Release, Lot, Cert.)	on Sample? 🔲 X-Ref No
	Comments 2 bars @ 3 Feet	each
	(size of sample represented by this card (3 rebar @ 5 ft each, 2 cans @ 1 pi	int each, etc.) and any other pertinent information)

Reinforcing Steel Sample Card

TA 182H Rev. 1000 8-07 VERMONT AGENCY OF TRANSPORTATION MATERIALS AND RESEARCH DIVISION MONTPELIER, VERMONT 05602				
REPORT ON SAMPLE OF PORTLAND CEMENT				
Proj. Name <u>STOCK BRIDGE</u> Proj.	No. STP BRF 013-4(21)			
Lab No I.D. Marks Quar	nt. Represented 10 CY			
Name <u>Fry ASH SLAG</u> Pay I	item 501 541 Type FA / SLAG			
Sample/Submitted By John DOE Title TECH	W Tested By			
Sampled 02/17/09 Received 02/18/09 Tested	Reported			
SA-Lue hea Date Ground OIIO Resident D	BASSETT			
Sample From Plan	CARROLL CONCRETE, RWIDOLPH, VT			
SourceLAFARGE				
Location Used/To Be Used	Exam, For701. XX			

Flyash / Slag Cement Sample Card

VERMONT AGENCY OF TRANSPORTATION MATERIALS AND RESEARCH DIVISION MONTPELIER, VERMONT 05602						
REPORT ON SAMPLE OF PORTLAND CEMENT						
Proj. Name Stock BRIDGE Proj. No. STP BRF 013-4(21)						
Lab No.       I.D. Marks       ACC.       Quant. Represented       20 cY         Name       BLENDED       CEMENT       Pay Item       501       541       Type       T         Name       BLENDED       CEMENT       Pay Item       501       541       Type       T         Sample/Submitted By       John Doe       Title       TECH       IV       Tested By         Sampled       02/21/01       Received       02/22/01       Tested       Reported						
SAL LINE ITEM 0110 Resident D. BASSETT Date Ground 0110 Resident D. BASSETT Sample From BUCKET LOADER Plant CARROLL, Concrete, W. LEBANON, NH						
Source CIMENT QUEBEC						
Location Used/To Be Used BRIDGE_ABUTMENT Exam, For701.XX						

Portland / Blended Cement Sample Card

	LABORATORY NO Date Rcv'd @ Lab/
	Project Name_ Johnson Project No. BF 0248(4)
)	Name of Pay Item (6 inch) Yellow Line Pay Item No. 646 . 215
	Material Name White rome Trank Right Type Mat. Spec. No. 708.08(d)
	Quantity Rep. 75,000 LF Line Item No. 0210
	Sampled by (Print Name) John Doc Date Sampled 01 / 15 / 18
	Sample Type: A= I= Where Sampled Sprayer Truck on Project Time 9:30 AM
	Sample Source L+D Salety Marking (Location on Project, Plánt Name, etc.)
	Material Source <u>Ennis - IFlint</u> NoNo
	Ident. No. <u>CPP 1707 Y 1371</u> (Release, Lot, Cert.) Comparison Sample? X-Ref No
	Comments 2 cans @ 1 Pint & For addition to ANDPMBL &
	(size of sample represented by this card (3 rebar @ 5 ft each, 2 cans @ 1 pint each, etc.) and any other pertinent information)

Paint Sample Card

## SAMPLING CONSIDERATIONS

#### SAMPLING REINFORCING BARS

#### Size of Sample

The minimum length of straight bar or element required for testing is 3 feet, and the minimum number of test sections required is two. These may be obtained either from a single 6 foot straight section or from two bent bars that also contain at least 3 feet of straight bar.

#### SAMPLING FRESH CONCRETE

#### Care and Identification of Concrete Cylinders for Compressive Strength Testing

- a. Specimens shall be molded on a level, rigid surface, free of vibration and other disturbances. Test cylinders must be stored on a level surface. Specimens received at the Central Laboratory with ends which are not cast with a plane perpendicular to the axis will be discarded.
- b. Initial Curing: Immediately after molding and finishing, the specimens shall be stored for a period up to 48 h in a temperature range from 16 to 27°C (60 to 80°F) in an environment preventing moisture loss from the specimens. For concrete mixtures with a specified strength of 40 MPa (6000 psi) or greater, the initial curing temperature shall be between 20 and 26°C (68 and 78°F). Various procedures are capable of being used during the initial curing period to maintain the specified moisture and temperature conditions. An appropriate procedure or combination of procedures shall be used. Shield all specimens from direct sunlight and, if used, radiant heating devices. The storage temperature shall be controlled by the use of heating and cooling devices, as necessary. Record the temperature using a maximum-minimum thermometer. If cardboard molds are used, protect the outside surface of the molds from contact with wet burlap or other sources of water.
- c. Standard Curing: On completion of initial curing and within 30 min after removing the molds, cure specimens with free water maintained on their surfaces at all times at a temperature of  $23 \pm 2^{\circ}C$  (73.5 ± 3.5°F) using water storage tanks or moist rooms complying with the requirements of Specification M 201, except immediately before testing. Specimens that are to be transported to the Central Laboratory within the initial 48 hour curing period shall remain in their molds in a moist environment, until they are received in the laboratory. Standard cured specimens which are not to be transported within the initial 48 hour curing period shall be removed from the molds and stored in a concrete curing box conforming to that described in AASHTO M 201.
- d. Field Curing: Store cylinders in or on the structure as near to the point of deposit of the concrete represented as possible. Protect all surfaces of the cylinders from the elements in as near as possible the same way as the formed work. Provide the cylinders with the same temperature and moisture environment as the structural work. Test the specimens in the moisture condition resulting from the specified curing treatment. To meet these conditions, specimens made for the purpose of determining when a structure is capable of being put in service shall be removed from the molds at the time of removal of form work.

# Vermont Agency of Transportation

- e. Prior to transporting, cure and protect specimens as required in b, c, and d above. Specimens shall not be transported until at least 8 h after final set. Final set can be safely assumed to occur 10 hours after mixing. During transporting, protect the specimen with suitable cushioning material to prevent damage from jarring. During cold weather, protect the specimens from freezing with suitable insulation material. Prevent moisture loss during transportation by wrapping the specimens in plastic, wet burlap, by surrounding them with wet sand or tight-fitting plastic caps on plastic molds. Transportation time shall not exceed 4 h.
- f. Molds shall be labeled with required identification before the specimens are cast, and this identification shall be transferred to the cylinders immediately after removal from the molds. Each cylinder should be identified by number and/ or letter, which is also entered on the back of the "Report on Concrete Cylinders" card.
- g. If the Resident Engineer requires "early breaks" to determine the strength of the concrete prior to 28 days, the Resident Engineer shall notify the Central Laboratory 24 hours in advance of the desired time of the cylinder break.
- h. Unless otherwise indicated, the Resident Engineer enters appropriate data in the thirty-nine sections of the card, as described on above. The "yellow" cylinder card should be transferred with the first group of cylinders to be tested. Subsequent groups of cylinders from the same batch require an attached photocopy of the original "yellow" cylinder card.

# SAMPLING BITUMINOUS MIXTURES

#### **Marking of Samples**

Sample identification shall be made out as indicated above. In addition to the information required on the sample identification, be sure to include the combined aggregate bulk specific gravity, the mix design number, the load slip number, the computed slip asphalt content, the mix temperature, the asphalt specific gravity, the time batched and the test number. Do not use the sample container as a sample tag.

#### Sampling at the Paver

Bituminous mixtures sampled on project shall be sampled from the paver or material transfer vehicle hopper or from the paver auger in accordance with AASHTO R 97. Contractor assisted sampling will be allowed provided sampling is witnessed by a qualified State inspector.

## SAMPLING OF LIQUID ASPHALT PRODUCTS, P.G. BINDERS, AND EMULSIONS

## **Safety Precautions**

Bituminous materials may be as hot as 350° F and will cause severe burns if spilled or splashed on the body. The technician performing this operation should inform others (on site) and if possible be observed. In the event that VTrans representative is not permitted to take samples due to producer safety protocols, sampling must be witnessed by VTrans representative and sample immediately taken into custody.

The following safety precautions shall be employed:

a. Gloves and long sleeve shirts with sleeves rolled down shall be worn while sampling and sealing containers.

- b. Face shields must be worn while sampling.
- c. The person taking the sample shall stand away from the sampling valve as far as practical and upwind of the valve to avoid being splashed with the liquid.
- d. The sample shall be taken such that splashing of hot materials is prevented.
- e. During sealing, the sample container shall be placed on a firm, level surface to prevent splashing, dropping or spilling of the material.
- f. A plug of solidified material can form within the pipe nipple leading from the sampling valve, which could cause a bubble to form and splatter when the sample is drawn off. The nipple should be checked for solidified material prior to sampling. If necessary, **with the valve closed**, the nipple should be reamed or heated to remove any solidified material.

#### **Sample Container – Additional Information**

Samples shall be placed in containers that comply with the following:

- a. Performance graded binder 1 quart metal can with double compression lid.
- b. Asphalt Emulsion 1 quart wide mouth plastic jars with screw top containing a fiber board Teflon coated insert.

# Only new, clean sample containers shall be used. Suitable containers may be obtained from the Central Laboratory.

# **Appendix A: Pay Item and Certification Quick Reference**

	Pay Item and Certification Q	uick Refe	erence	
Pay Item No.	Pay Item Name	Accept- ance Method	Material Specification No.	Material Name
404.65	EMULSIFIED ASPHALT	APL	702.04	Emulsified Asphalt
407.16 (2018)	POLYMER-MODIFIED EMULSIFIED ASPHALT	APL	702.04(c)	Polymer-Modified Emulsified Asphalt
415.25	EMULSIFIED ASPHALT, COLD MIX	APL	702.04	Emulsified Asphalt
418.10 (10/22/2019)	ASPHALTIC APPROACH MATERIAL	APL	707.17	Asphaltic Plug Joint Binder
501.37 - 501.39	HIGH PERFORMANCE CONCRETE	D	715.05	Stay-in-Place Corrugated Metal Forms for Superstructure Slabs
505.10 - 505.20	STEEL PILING	D	730.01	Steel Piling
505.35	PERMANENT STEEL SHEET PILING	D	730.02	Steel Sheet Piling
		APL	707.03	Mortar, Type IV
		APL	708.03(a)	Structural Steel Coating, Shop Applied
		APL	708.03(b)	Structural Steel Coating, Field Applied
		D	714.02	Structural Steel
506.50 - 506.75	STRUCTURAL STEEL	D	714.03	High-Strength Low-Alloy Structural Steel
		D	714.04	Carbon Steel Bolts, Nuts and Washers
		D	714.05	High-Strength Bolts, Nuts and Washers
		D	714.06	Heat-Treated Structural Bolts
		D	714.12	Direct Tension Indicators
		D	714.13	Tension Control Assemblies Mechanical Splices for Bar
507.19	MECHANICAL BAR CONNECTOR	D	713.02	Reinforcement
		D	713.01	Bar Reinforcement
507.11 - 507.13	REINFORCING STEEL, LEVEL I, II, III	D	713.02	Mechanical Splices for Bar Reinforcement
508.15	SHEAR CONNECTORS	Buy America	714.10	Welded Stud Shear Connectors
	PRESTRESSED CONCRETE BOX BEAMS, VOIDED SLABS, &	APL	707.03	Mortar, Type IV
510.21 - 23	GIRDERS	D	713.01	Bar Reinforcement
	GINDENS	D	713.06	Prestressing Strands
510.24	GROUTING SHEAR KEYS	APL	707.03	Mortar, Type IV
514.10	WATER REPELLENT, SILANE	APL	514.02	Water Repellent, Silane
516.10	BRIDGE EXPANSION JOINT, ASPHALTIC PLUG	APL	707.15	Asphaltic Plug Joints for Bridges
		Buy America	714.02	Structural Steel
		Buy America	714.04	Carbon Steel Bolts, Nuts and Washers
516.11 - 516.12	BRIDGE EXPANSION JOINT, VERMONT & FINGER PLATE	Buy America	714.05	High-Strength Bolts, Nuts and Washers
		Buy America	714.10	Welded Stud Shear Connectors
			519.10	Membrane Waterproofing, Spray Applied
519.10 (2018)	MEMBRANE WATERPROOFING, SPRAY APPLIED	APL	726.11(a) (10/22/19)	Waterproofing Membrane Systems, Type I
			519.02	Sheet Membrane Waterproofing, Torch Applied
519.20	SHEET MEMBRANE WATERPROOFING, TORCH APPLIED	APL	726.11(b) (10/22/19)	Waterproofing Membrane Systems, Type II
520.10 (2011)	MEMBRANE WATERPROOFING, SPRAY APPLIED	APL	520.02	Membrane Waterproofing, Spray Applied
522.20	STRUCTURAL LUMBER AND TIMBER, UNTREATED	D	709.01	Structural Lumber & Timber

	Pay Item and Certification Qu	lick Refe	rence	
Pay Item No.	Pay Item Name	Accept- ance Method	Material Specification No.	Material Name
522.25	STRUCTURAL LUMBER AND TIMBER, TREATED	D	709.01	Structural Lumber & Timber
522.35	NONSTRUCTURAL LUMBER, TREATED	D	726.01	Timber Preservative
522.40	STRUCTRUAL GLUED LAMINATED TIMBER	D	709.03	Structural Glue Laminated Timber
		D	714.04	Carbon Steel Bolts, Nuts and Washe
525.33 -525.34	BRIDGE RAILING, GALVANIZED 2, 3, 4 RAIL BOX BEAM	D	714.07	Anchor Bolts, Bridge Railing
		D	732.03	Galvanized Box Beam Bridge Railing
		D	714.04	Carbon Steel Bolts, Nuts and Washe
		D	714.07	Anchor Bolts, Bridge Railing
	BRIDGE RAILING, GALVANIZED HDSB/FASCIA MOUNTED &	D	728.02(b) (2018)	Steel Beam and Thrie Beam Rail
525.41 - 525.44	STEEL TUBING	D	728.02(d) (2011)	Steel Beam and Thrie Beam Rail
		D	732.03	Galvanized Box Beam Bridge Railing
		D	732.04(b)	Steel Posts and Components
		D	713.01	Bar Reinforcement
505 45	BRIDGE RAILING, GALVANIZED STEEL TUBING/CONCRETE	D	714.04	Carbon Steel Bolts, Nuts and Washe
525.45	COMBINATION	D	714.07	Anchor Bolts, Bridge Railing
		D	732.03	Galvanized Box Beam Bridge Railing
		D	728.02(b) (2018)	Steel Beam and Thrie Beam Rail
	BRIDGE RAILING REPAIR, TYPE I & II	D	728.02(d) (2011)	Steel Beam and Thrie Beam Rail
525.50 - 525.55		D	728.03(a) (2018)	Hardware for Cable, Steel Beam, an Thrie Beam Rail
		D	728.03(c) (2011)	Hardware for Cable, Steel Beam, an Thrie Beam Rail
		D	732.04(b)	Steel Posts and Components
		D	728.02(b) (2018)	Steel Beam and Thrie Beam Rail
		D	728.02(d) (2011)	Steel Beam and Thrie Beam Rail
525.60	BRIDGE RAILING REPAIR, TYPE III	D	728.03(a) (2018)	Hardware for Cble, Steel Beam, an Thrie Beam Rail
		D	728.03(c) (2011)	Hardware for Cable, Steel Beam, ar Thrie Beam Rail
		D	732.04(b)	Steel Posts and Components
		APL	514.02	Water Repellent, Silane
525.70	BRIDGE RAILING, CONCRETE F-SHAPE	D	713.01	Bar Reinforcement
		APL	707.03	Mortar, Type IV
		Buy America	714.03	High-Strength Low-Alloy Structura Steel
531.15	BEARING DEVICE ASSEMBLY, HIGH LOAD MULTI-ROTATIONAL	D	714.08	Anchor Bolts, Bearing Devices
		Buy	731.05	Stainless Steel
		America	707.03	Martas Tura 11
		APL	707.03	Mortar, Type IV
531.16	BEARING DEVICE ASSEMBLY, PLAIN ELASTOMERIC PAD	Buy America	714.03	High-Strength Low-Alloy Structura Steel
		D	714.08	Anchor Bolts, Bearing Devices
		D	731.03	Elastomeric Material
		APL	707.03	Mortar, Type IV
		Buy America	714.03	High-Strength Low-Alloy Structura Steel
531.17	BEARING DEVICE ASSEMBLY, STEEL REINFORCED ELASTOMERIC	D	714.08	Anchor Bolts, Bearing Devices
	PAD	D	731.03	Elastomeric Material
		Buy		
		America	731.05	Stainless Steel

	Pay Item and Certification Qu	ick Refe	rence	
Pay Item No.	Pay Item Name	Accept- ance Method	Material Specification No.	Material Name
		APL	707.03	Mortar, Type IV
		D	714.02	Structural Steel
531.18	BEARING DEVICE ASSEMBLY, ELASTOMERIC PAD W/EXT. LOAD PLATES	Buy America	714.03	High-Strength Low-Alloy Structural Steel
		D	714.08	Anchor Bolts, Bearing Devices
		D	731.03	Elastomeric Material
524.40		APL	707.03	Mortar, Type IV
531.19	REMOVE AND REPLACE EXISTING ANCHOR BOLTS	D	714.08	Anchor Bolts, Bearing Devices
		APL	707.03	Mortar, Type IV
		D	713.01	Bar Reinforcement
540.10	PRECAST CONCRETE STRUCTURE	D	713.02 (10/22/2019)	Mechanical Splices for Bar Reinforcement
		D	713.05	Welded Wire Reinforcement
		APL	726.11(c)	Waterproofing Membrane System, Type III
541.58	MORTAR, TYPE IV	APL	707.03	Mortar, Type IV
		APL	707.03	Mortar, Type IV
		D	714.02	Structural Steel
	PREFABRICATED BRIDGE UNIT SUPERSTRUCTURE	D	714.03	High-Strength Low-Alloy Structural Steel
		D	714.04	Carbon Steel Bolts, Nuts and Washers
544.10 (2018)		D	714.05	High-Strength Bolts, Nuts and Washers
544.10 (2010)		D	714.06	Heat-Treated Structural Bolts
		D	714.12	Direct Tension Indicators
		D	714.13	Tension Control Assemblies
		D	713.01	Bar Reinforcement
		D	713.02	Mechanical Splices for Bar Reinforcement
		Buy America	714.10	Welded Stud Shear Connectors
580.17	RAPID SETTING CONCRETE REPAIR MATERIAL	APL	780.01(a)	Concrete Repair Material, Type I
580.18	OVERHEAD AND VERTICAL CONCRETE REPAIR MATERIAL	APL	780.01(b)	Concrete Repair Material, Type II
580.20	RAPID SETTING CONCRETE REPAIR METERIAL WITH COARSE AGGREGRATE	APL	780.01(c)4	Concrete Repair Material, Type III
580.21	POLYMER CONCRETE REPAIR MATERIAL	APL	780.01(d)	Concrete Repair Material, Type IV
601.0000 to 601.0199	CSP	Buy America	711.01	Corrugated Steel Pipe, Pipe Arches and Underdrains
601.0200 to 601.0399	СААР	А	711.02	Corrugated Aluminum Pipe, Arches, Underdrains
601.0400 to 601.0599	PCCSP	Buy America	711.03	Polymeric Coated Corrugated Steel Pip and Pipe Arches
601.0600 to 601.0799	PCCSP(PI)	Buy America	711.03	Polymeric Coated Corrugated Steel Pip and Pipe Arches
601.0800 to 601.0899	RCP	D	710.01	Reinforced Concrete Pipe
601.0900 to 601.0999	СРЕР	APL	710.03	Corrugated Polyethylene Pipe
601.2000 to 601.2199	CSP(SL)	Buy America	711.01	Corrugated Steel Pipe, Pipe Arches an Underdrains
601.2200 to 601.2399	CAAP(SL)	A	711.02	Corrugated Aluminum Pipe, Arches, Underdrains
601.2399 601.2400 to 601.2599	PCCSP(SL)	Buy America	711.03	Polymeric Coated Corrugated Steel Pip and Pipe Arches

	Pay Item and Certification Quick Reference					
Pay Item No.	Pay Item Name	Accept- ance Method	Material Specification No.	Material Name		
601.2600 to 601.2799	CPEP(SL)	APL	710.03	Corrugated Polyethylene Pipe		
601.2799						
601.2999	CPPP(SL)	APL	710.07	Corrugated Polypropylene Pipe		
601.3000 to 601.3199	CSPA	Buy America	711.01	Corrugated Steel Pipe, Pipe Arches and Underdrains		
601.3200 to	СААРА	A	711.02	Corrugated Aluminum Pipe, Arches, Underdrains		
601.3399 601.3400 to	PCCSPA	Buy	711.03	Polymeric Coated Corrugated Steel Pip		
601.3599 601.3600 to		America Buy		and Pipe Arches Polymeric Coated Corrugated Steel Pip		
601.3799	PCCSPA(PI)	America	711.03	and Pipe Arches		
601.4000 to 601.4199	CSPA(SL)	Buy America	711.01	Corrugated Steel Pipe, Pipe Arches an Underdrains		
601.4200 to 601.4399	CAAPA(SL)	A	711.02	Corrugated Aluminum Pipe, Arches, Underdrains		
601.4400 to 601.4599	PCCSPA(SL)	Buy America	711.03	Polymeric Coated Corrugated Steel Pip and Pipe Arches		
601.5000 to 601.5199	CSP ELBOW	Buy America	711.01	Corrugated Steel Pipe, Pipe Arches an Underdrains		
601.5200 to 601.5399	CAAP ELBOW	A	711.02	Corrugated Aluminum Pipe, Arches, Underdrains		
601.5400 to 601.5599	PCCSP ELBOW	Buy America	711.03	Polymeric Coated Corrugated Steel Pip and Pipe Arches		
601.5600 to 601.5799	PCCSP ELBOW (PI)	Buy America	711.03	Polymeric Coated Corrugated Steel Pip and Pipe Arches		
601.5800 to 601.5899	CPEP ELBOW	APL	710.03	Corrugated Polyethylene Pipe		
601.6000 to 601.6199	CSPES	Buy America	711.01	Corrugated Steel Pipe, Pipe Arches an Underdrains		
601.6200 to 601.6399	CAAPES	A	711.02	Corrugated Aluminum Pipe, Arches, Underdrains		
601.6800 to 601.6899	RCPES	Buy America	710.02	Reinforced Concrete Pipe End Sectio		
601.7000 to 601.7099	CPEPES	APL	710.03	Corrugated Polyethylene Pipe		
601.8000 to 601.8199	CSPAES	Buy America	711.01	Corrugated Steel Pipe, Pipe Arches ar Underdrains		
601.8200 to 601.8399	CAAPAES	A	711.02	Corrugated Aluminum Pipe, Arches, Underdrains		
		APL	710.03	Corrugated Polyethylene Pipe		
		APL	710.07	Corrugated Polypropylene Pipe		
601.98 (2011)	CONCENTRIC REDUCER SECTION	Buy America	711.01	Corrugated Steel Pipe, Pipe Arches ar Underdrains		
		А	711.02	Corrugated Aluminum Pipe, Arches, Underdrains		
		D	711.03	Polymeric Coated Corrugated Steel Pi and Pipe Arches		
	CONCRETE CATCH BASIN WITH CAST IRON GRATE, CONCRETE	Buy America	713.01	Bar Reinforcement		
604.10 - 604.11	MANHOLE WITH CAST IRON COVER	Buy America	713.05	Welded Wire Reinforcement		
		D	715.01	Iron Casting		

	Pay Item and Certification Qu			
Pay Item No.	Pay Item Name	Accept- ance Method	Material Specification No.	Material Name
604.18	PRECAST REINFORCED CONCRETE DROP INLET WITH CAST IRON	APL	705.04	Precast Drop Inlets, Catch Basins, and Manholes
	GRATE	D	715.01	Iron Casting
604.20	PRECAST REINFORCED CONCRETE CATCH BASIN WITH CAST	APL	705.04	Precast Drop Inlets, Catch Basins, and Manholes
	IRON GRATE	D	715.01	Iron Casting
	PRECAST REINFORCED CONCRETE MANHOLE WITH CAST IRON		705.04	Precast Drop Inlets, Catch Basins, and
604.21	COVER	APL	705.04	Manholes
	COVER	D	715.01	Iron Casting
		Buy America	713.01	Bar Reinforcement
604.22	SANITARY SEWER MANHOLE	Buy America	713.05	Welded Wire Reinforcement
		D	715.01	Iron Casting
604.25	PRECAST REINFORCED CONCRETE PIPE DI WITH CAST IRON GRATE	Buy America	710.01	Reinforced Concrete Pipe
		D	715.01	Iron Casting
604.26	PRECAST REINFORCED CONCRETE PIPE DI WITH CONCRETE COVER	Buy America	710.01	Reinforced Concrete Pipe
	PRECAST REINFORCED CONCRETE CURB DI WITH CAST IRON GRATE	Buy America	713.01	Bar Reinforcement
604.30		Buy America	713.05	Welded Wire Reinforcement
		D	715.01	Iron Casting
604.412-604.418	REHAB. DROP INLET, CATCH BASIN, OR MANHOLES, CLASS I - III	D	715.01	Iron Casting
604.45	CAST IRON GRATE WITH FRAME TYPE A	D	715.01	Iron Casting
604.46	CAST IRON GRATE WITH FRAME TYPE B	D	715.01	Iron Casting
604.47	CAST IRON GRATE WITH FRAME TYPE D	D	715.01	Iron Casting
604.48	CAST IRON GRATE WITH FRAME TYPE E	D	715.01	Iron Casting
604.49	CAST IRON GRATE, TYPE C	D	715.01	Iron Casting
604.50 (2011)	STEEL GRATE	D	715.01	Iron Casting
604.55	CAST IRON COVER WITH FRAME	D	715.01	Iron Casting
604.56	CAST IRON COVER WITH FRAME, SEWER	D	715.01	Iron Casting
		APL	710.03	Corrugated Polyethylene Pipe
605.10, 605.11,	6, 8, and 12 INCH UNDERDRAIN PIPE	Buy America	711.01	Corrugated Steel Pipe, Pipe Arches ar Underdrains
605.13		APL	720.05 (2018)	Geotextiles for Underdrain Trench Lining
		D	720	Geotextiles
605.20, 605.21, &		APL	710.03	Corrugated Polyethylene Pipe
605.23	6, 8, and 12 INCH UNDERDRAIN CARRIER PIPE	Buy America	711.01	Corrugated Steel Pipe, Pipe Arches an Underdrains
		APL	710.03	Corrugated Polyethylene Pipe
605.95	UNDERDRAIN FLUSHING BASIN	Buy America	711.01	Corrugated Steel Pipe, Pipe Arches a Underdrains
		Buy America	715.01	Iron Casting
613.25 (2011)	GABION WALL	Buy America	712.04	Gabion Baskets
616.215 (2018)	VERTICAL GRANITE CURB, MOUNTABLE	APL	707.03	Mortar, Type IV
616.22 (2011)	GRANITE BRIDGE CURB	APL	707.03	Mortar, Type IV
616.225	REPOINTING GRANITE BRIDGE CURB	APL	707.03	Mortar, Type IV

America729.04Precast Reinforced Concrete Cu1Ve616.35TREATED TIMBER CURBD726.01Timber Preservative618.30DETECTABLE WARNING SURFACEAPL751.08Detectable Warning Surface619.14BOLLARDSBURunerica728.01(b) (2018)Steel Posts and Post Accessories619.15WODD MARKER POSTSD728.01(c) (2011)Steel Posts and Ancessories619.17YIELDING MARKER POSTSD725.01Timber Preservative620.16.22CCHAIN-LINK FENCEAPL727.02Chair Link Fence620.25WOVEN WIRE WITH STEEL POSTSBuy America727.01(a)Steel Posts and Ancess620.26WOVEN WIRE WITH STEEL POSTSBuy America727.01(a)Woven Wire Fabric for Fencing and Gates620.26WOVEN WIRE WITH WOOD POSTSBuy America727.01(a)Woven Wire Fabric for Fencing and Gates620.26WOVEN WIRE WITH WOOD POSTSBuy America727.01(a)Woven Wire Fabric for Fencing and Gates620.30DRIVE GATE FOR WOVEN WIRE FENCEBuy America727.01(c)Gates620.41WOOD BRACE FOR WOVEN WIRE FENCEBuy America727.01(c)Steel Posts and Braces620.42STEEL BRACE FOR WOVEN WIRE FENCED726.01Timber Preservative620.43SNOW BARRIER FENCED726.01Timber Preservative620.41WOOD BRACE FOR WOVEN WIRE FENCED726.01Timber Preservative620.42SNOW BARRIER FENCEAmericaD<		Pay Item and Certification Q	uick Refe	erence	
616.25 & 616.26         PRECAST REINFORCED CONCRETE CURB, TYPE A & TYPE B         Burg America         729.04         Precast Reinforced Concrete Curb           616.35         TREATED TIMBER CURB         D         726.01         Timber Preservative           618.30         DETECTABLE WARNING SURFACE         APL         731.08         Detectable Warning Surface           619.14         BOLLARDS         Burg America         728.01(b) (2018)         Steel Posts and Post Accessories           619.15         WOOD MARKER POSTS         D         728.01         Timber Preservative           620.16         WOVEN WIRE WITH STEEL POSTS         D         727.01(a)         Steel Posts and Anchors           620.25         WOVEN WIRE WITH STEEL POSTS         D         727.01(a)         Woven WIRE Forceing and America         Steel Posts and Paraces           620.26         WOVEN WIRE WITH WOOD POSTS         D         727.01(a)         Woven WIRE Forceing and Gates           620.20         DIRIVE GATE FOR WOVEN WIRE FENCE         Burg America         727.01(a)         Woven WIRE Fabric for Fencing and Gates           620.40         STEEL BRACE FOR WOVEN WIRE FENCE         Burg America         727.01(a)         Woven WIRE Fabric for Fencing and Gates           620.41         WOOD BARAE FOR WOVEN WIRE FENCE         D         726.01         Timber Preserv	Pay Item No.	Pay Item Name	ance		Material Name
America729.04Precast Reinforced Concrete Cu1Ve616.35TREATED TIMBER CURBD726.01Timber Preservative618.30DETECTABLE WARNING SURFACEAPL751.08Detectable Warning Surface619.14BOLLARDSBURunerica728.01(b) (2018)Steel Posts and Post Accessories619.15WODD MARKER POSTSD728.01(c) (2011)Steel Posts and Ancessories619.17YIELDING MARKER POSTSD725.01Timber Preservative620.16.22CCHAIN-LINK FENCEAPL727.02Chair Link Fence620.25WOVEN WIRE WITH STEEL POSTSBuy America727.01(a)Steel Posts and Ancess620.26WOVEN WIRE WITH STEEL POSTSBuy America727.01(a)Woven Wire Fabric for Fencing and Gates620.26WOVEN WIRE WITH WOOD POSTSBuy America727.01(a)Woven Wire Fabric for Fencing and Gates620.26WOVEN WIRE WITH WOOD POSTSBuy America727.01(a)Woven Wire Fabric for Fencing and Gates620.30DRIVE GATE FOR WOVEN WIRE FENCEBuy America727.01(c)Gates620.41WOOD BRACE FOR WOVEN WIRE FENCEBuy America727.01(c)Steel Posts and Braces620.42STEEL BRACE FOR WOVEN WIRE FENCED726.01Timber Preservative620.43SNOW BARRIER FENCED726.01Timber Preservative620.41WOOD BRACE FOR WOVEN WIRE FENCED726.01Timber Preservative620.42SNOW BARRIER FENCEAmericaD<			APL	707.03	Mortar, Type IV
618.30         DETECTABLE WARNING SURFACE         APL BULARDS         751.08         Detectable Warning Surface           619.14         BOLLARDS         Bury America         728.01(b) (2018)         Steel Posts and Post Accessories           619.15         WODD MARKER POSTS         D         728.01(c) (2011)         Steel Posts and Post Accessories           619.17         YIEDDING MARKER POSTS         D         751.01(a)         Steel Posts and Post Accessories           620.152.02.22         CHAIN-LINK FERCE         APL         727.01(c)         Chain-Link Fence           620.25         WOVEN WIRE WITH STEEL POSTS         Bury America         727.01(c)         Steel Posts and Braces           620.26         WOVEN WIRE WITH WOOD POSTS         Bury America         727.01(c)         Steel Posts and Braces           620.30         DRIVE GATE FOR WOVEN WIRE FENCE         Bury America         727.01(e)         Gates           620.41         WOOD BARCE FOR WOVEN WIRE FENCE         D         726.01         Timber Preservative           620.41         WOOD BARCE FOR WOVEN WIRE FENCE         D         726.01         Timber Preservative           620.42         STEEL BRACE FOR WOVEN WIRE FENCE         D         726.01         Timber Preservative           620.42         OL141         WOOD BARCE FOR WOVEN WIRE	616.25 & 616.26	PRECAST REINFORCED CONCRETE CURB, TYPE A & TYPE B	· ·	729.04	Precast Reinforced Concrete Curb
BULARDS         Buy America 519.15         Steel Posts and Post Accessories 728.01(c) (2011)         Steel Posts and Post Accessories 728.01(c) (2011)           619.15         WOOD MARKER POSTS         D         726.01         Timber Preservative 520.17 (2012)           620.17 (2012)         YLELDING MARKER POSTS         D         751.01(a)         Steel Posts and Anchors 520.11 (20.22           620.25         WOVEN WIRE WITH STEEL POSTS         D         727.01(a)         Woven Wire Fahr for Fencing and Gates           620.26         WOVEN WIRE WITH STEEL POSTS         Buy America         727.01(a)         Woven Wire Fahr for Fencing and Gates           620.26         WOVEN WIRE WITH WOOD POSTS         D         725.01         Timber Preservative Buy America         V           620.30         DRIVE GATE FOR WOVEN WIRE FENCE         Buy America         727.01(a)         Woven Wire Fahr for Fencing and Gates           620.40         STEEL BRACE FOR WOVEN WIRE FENCE         Buy America         727.01(c)         Steel Posts and Braces           620.41         WOOD BRACE FOR WOVEN WIRE FENCE         D         726.01         Timber Preservative           620.75 (2011)         SNOW BARRIER         PLANK RAIL         D         727.01(c)         Steel Posts and Braces           621.15 (2011)         PLANK RAIL         D         728.011	616.35	TREATED TIMBER CURB	D	726.01	Timber Preservative
619.14         BOLLARDS         Americal Buy Americal         728.01(c) (2013)         Steel Posts and Post Accessories           619.15         WOOD MARKER POSTS         D         726.01         Timber Preservative           619.17         VIELDING MARKER POSTS         D         727.02         Chain-Link Fence           620.11-620.22         CHAIN-LINK FENCE         APL         727.01(a)         Steel Posts and Anchors           620.25         WOVEN WIRE WITH STEEL POSTS         Buy America         727.01(a)         Woven Wire Fabric for Fencing and Gates           620.26         WOVEN WIRE WITH STEEL POSTS         Buy America         727.01(a)         Woven Wire Fabric for Fencing and America           620.26         WOVEN WIRE WITH WOOD POSTS         Buy America         727.01(a)         Woven Wire Fabric for Fencing and America           620.30         DRIVE GATE FOR WOVEN WIRE FENCE         Buy America         727.01(a)         Woven Wire Fabric for Fencing and America           620.41         WOOD BARCE FOR WOVEN WIRE FENCE         Buy America         727.01(a)         Gates           620.40         STEEL BRACE FOR WOVEN WIRE FENCE         Buy America         727.01(a)         Gates           620.41         WOOD BARCE FOR WOVEN WIRE FENCE         Buy America         726.01         Timber Preservative           620	618.30	DETECTABLE WARNING SURFACE	APL	751.08	Detectable Warning Surface
America         128.01(201)         Steel Posts and Prost accessories           619.17         WOOD MARKER POSTS         D         726.01         Timber Preservative           620.11-620.22         CHAIN-LINK FENCE         APL         727.01(a)         Steel Posts and Anchors           620.25         WOVEN WIRE WITH STEEL POSTS         Buy         727.01(a)         Woven Wire Fabric for Fencing and America           620.26         WOVEN WIRE WITH STEEL POSTS         Buy         727.01(a)         Woven Wire Fabric for Fencing and America           620.26         WOVEN WIRE WITH WOOD POSTS         Buy         727.01(a)         Woven Wire Fabric for Fencing and America           620.30         DRIVE GATE FOR WOVEN WIRE FENCE         Buy         727.01(a)         Gates           620.30         DRIVE GATE FOR WOVEN WIRE FENCE         Buy         727.01(a)         Gates           620.40         STEEL BRACE FOR WOVEN WIRE FENCE         Buy         727.01(a)         Gates           620.41         WOOD BRACE FOR WOVEN WIRE FENCE         D         726.01         Timber Preservative           620.42         SNOW BARRIER         D         726.01         Timber Preservative           620.41         WOOD BRACE FOR WOVEN WIRE FENCE         D         726.01         Timber Preservative           <	619.14	BOLLARDS	America		
É19.17         YIELDING MARKER POSTS         D         751.01(a)         Steel Posts and Anchors           620.11-620.22         CHAIN-LINK FENCE         APL         727.02         Chain-Link Fence           620.25         WOVEN WIRE WITH STEEL POSTS         Buy America         727.01(a)         Woven Wire Fabric for Fencing and Gates           620.26         WOVEN WIRE WITH WOOD POSTS         Buy America         727.01(a)         Woven Wire Fabric for Fencing and Gates           620.26         WOVEN WIRE WITH WOOD POSTS         Buy America         727.01(a)         Woven Wire Fabric for Fencing and Gates           620.30         DRIVE GATE FOR WOVEN WIRE FENCE         Buy America         727.01(e)         Gates           620.40         STEEL BRACE FOR WOVEN WIRE FENCE         Buy America         727.01(e)         Gates           620.41         WOOD BRACE FOR WOVEN WIRE FENCE         Buy America         727.01(e)         Steel Posts and Braces           620.42         STEEL BRACE FOR WOVEN WIRE FENCE         D         726.01         Timber Preservative           620.43         WOOD BRACE FOR WOVEN WIRE FENCE         D         726.01         Timber Preservative           620.43         SOUM BARRIER         D         727.02(a)         Chain-Link Fabric           620.75 (2011)         SNOW BARRIER <td< td=""><td></td><td></td><td>-</td><td>728.01(c) (2011)</td><td>Steel Posts and Post Accessories</td></td<>			-	728.01(c) (2011)	Steel Posts and Post Accessories
620.11-620.22         CHAIN-LINK FENCE         APL         727.02         Chain-Link Fence           620.25         WOVEN WIRE WITH STEEL POSTS         Buy America         727.01(a)         Woven Wire Fabric for Fencing and Gates           620.25         WOVEN WIRE WITH STEEL POSTS         Buy America         727.01(c)         Steel Posts and Braces           620.26         WOVEN WIRE WITH WOOD POSTS         D         726.01         Timber Preservative           620.26         WOVEN WIRE WITH WOOD POSTS         Buy America         727.01(a)         Woven Wire Fabric for Fencing and Gates           620.30         DRIVE GATE FOR WOVEN WIRE FENCE         Buy America         727.01(a)         Woven Wire Fabric for Fencing and Gates           620.41         WOOD BRACE FOR WOVEN WIRE FENCE         Buy America         727.01(a)         Gates           620.41         WOOD BRACE FOR WOVEN WIRE FENCE         Buy America         727.01(c)         Steel Posts and Braces           620.42         STEEL BRACE FOR WOVEN WIRE FENCE         D         726.01         Timber Preservative           620.43         WOOD BRACE FOR WOVEN WIRE FENCE         D         726.01         Timber Preservative           620.41         WOOD BRACE FOR WOVEN WIRE FENCE         D         726.01         Timber Preservative           620.75 (2011)	619.15	WOOD MARKER POSTS	D	726.01	Timber Preservative
620.25     WOVEN WIRE WITH STEEL POSTS     Buy America Buy America     727.01(a)     Woven Wire Fabric for Fencing and Gates       620.26     WOVEN WIRE WITH WOOD POSTS     D     726.01     Timber Preservative       820.26     WOVEN WIRE WITH WOOD POSTS     Buy America     727.01(a)     Woven Wire Fabric for Fencing and Gates       620.26     WOVEN WIRE WITH WOOD POSTS     Buy America     727.01(a)     Woven Wire Fabric for Fencing and Gates       620.30     DRIVE GATE FOR WOVEN WIRE FENCE     Buy America     727.01(a)     Woven Wire Fabric for Fencing and Gates       620.40     STEEL BRACE FOR WOVEN WIRE FENCE     Buy America     727.01(c)     Gates       620.41     WOOD BRACE FOR WOVEN WIRE FENCE     D     726.01     Timber Preservative       620.42     WOWEN WIRE FENCE     D     726.01     Timber Preservative       620.43     WOOD BRACE FOR WOVEN WIRE FENCE     D     726.01     Timber Preservative       620.45 (2018)     PLANK RAIL     D     726.01     Timber Preservative       620.75 (2011)     SNOW BARRIER FENCE     APL     727.02(a)     Chain-Link Fabric       621.15 (2011)     PLANK RAIL     D     728.01(c)     Timber Preservative       621.17     CABLE GUARDRAIL     D     728.01(c)     Steel Posts and Post Accessories       621.173 (2011)	619.17	YIELDING MARKER POSTS	D	751.01(a)	Steel Posts and Anchors
S20.25         WOVEN WIRE WITH STEEL POSTS         America Buy America         727.01(c) P28.01         Gates           620.26         WOVEN WIRE WITH WOOD POSTS         D         726.01         Timber Preservative Buy America         727.01(c) P28.01         Steel Posts and Braces           620.26         WOVEN WIRE WITH WOOD POSTS         D         727.01(c) P28.01         Gates           620.26         WOVEN WIRE WITH WOOD POSTS         Buy America         727.01(c) America         Gates           620.30         DRIVE GATE FOR WOVEN WIRE FENCE         Buy America         727.01(c) America         Woven Wire Fabric for Fencing and Gates           620.40         STEEL BRACE FOR WOVEN WIRE FENCE         Buy America         727.01(c)         Steel Posts and Braces           620.41         WOOD BRACE FOR WOVEN WIRE FENCE         Buy America         727.01(c)         Steel Posts and Braces           620.45 (2018)         PLANK RAIL         D         726.01         Timber Preservative           620.75 (2011)         SNOW BARRIER         Buy America         727.02(c)         Chain-Link Fabric America           620.75 (2018)         SNOW BARRIER FENCE         API         727.02(c)         Chain-Link Fabric America           621.15 (2011)         PLANK RAIL         D         728.03(c)         Posts, Gate Frames, Rais, Braces an Miscel	620.11-620.22	CHAIN-LINK FENCE	APL	727.02	Chain-Link Fence
Buy America America         727.01(c) America         Steel Posts and Braces           620.26         WOVEN WIRE WITH WOOD POSTS         D         726.01         Timber Preservative           Buy America         727.01(a)         Woven Wire Fabric for Fencing and Gates         Gates           620.30         DRIVE GATE FOR WOVEN WIRE FENCE         Buy America         727.01(a)         Woven Wire Fabric for Fencing and Gates           620.40         STEEL BRACE FOR WOVEN WIRE FENCE         Buy America         727.01(a)         Woven Wire Fabric for Fencing and Gates           620.41         WOOD BRACE FOR WOVEN WIRE FENCE         Buy America         727.01(a)         Gates           620.42         STEEL BRACE FOR WOVEN WIRE FENCE         Buy America         727.01(c)         Steel Posts and Braces           620.41         WOOD BRACE FOR WOVEN WIRE FENCE         Buy America         727.01(c)         Steel Posts and Braces           620.42         WOOD BRACE FOR WOVEN WIRE FENCE         D         726.01         Timber Preservative           620.41         WOOD BRACE FOR WOVEN WIRE FENCE         D         726.01         Timber Preservative           620.45         WOOD BRACE FOR WOVEN WIRE FENCE         D         726.01         Timber Preservative           620.75         SNOW BARRIER         D         726.01 <t< td=""><td>620.25</td><td></td><td>-</td><td>727.01(a)</td><td>Woven Wire Fabric for Fencing and Gates</td></t<>	620.25		-	727.01(a)	Woven Wire Fabric for Fencing and Gates
620.26         WOVEN WIRE WITH WOOD POSTS         Buy America Buy America         727.01(a)         Woven Wire Fabric for Fencing and Gates           620.30         DRIVE GATE FOR WOVEN WIRE FENCE         Buy America         727.01(a)         Woven Wire Fabric for Fencing and Gates           620.30         DRIVE GATE FOR WOVEN WIRE FENCE         Buy America         727.01(a)         Woven Wire Fabric for Fencing and Gates           620.40         STEEL BRACE FOR WOVEN WIRE FENCE         Buy America         727.01(c)         Steel Posts and Braces           620.41         WOOD BRACE FOR WOVEN WIRE FENCE         D         726.01         Timber Preservative           620.41         WOOD BRACE FOR WOVEN WIRE FENCE         D         726.01         Timber Preservative           620.42         WOOD BRACE FOR WOVEN WIRE FENCE         D         727.02(a)         Chain-Link Fabric           620.41         WOOD BRACE FOR WOVEN WIRE FENCE         D         727.02(a)         Chain-Link Fabric           620.75 (2018)         PLANK RAIL         D         727.02(a)         Chain-Link Fabric           621.15 (2011)         PLANK RAIL         D         727.02(b)         Micellaneous Hardware Micellaneous Hardware           621.17 (2011)         CABLE GUARDRAIL         D         728.03(c) (2011)         Timber Preservative           D <td>620.25</td> <td>WOVEN WIRE WITH STEEL POSTS</td> <td>· ·</td> <td>727.01(c)</td> <td>Steel Posts and Braces</td>	620.25	WOVEN WIRE WITH STEEL POSTS	· ·	727.01(c)	Steel Posts and Braces
620.26         WOVEN WIRE WITH WOOD POSTS         America Buy America         727.01(a)         Gates           620.30         DRIVE GATE FOR WOVEN WIRE FENCE         Buy America         727.01(a)         Woven Wire Fabric for Fencing and Gates           620.40         STEEL BRACE FOR WOVEN WIRE FENCE         Buy America         727.01(a)         Woven Wire Fabric for Fencing and Gates           620.41         WOOD BRACE FOR WOVEN WIRE FENCE         Buy America         727.01(c)         Steel Posts and Braces           620.42         STEEL BRACE FOR WOVEN WIRE FENCE         Buy America         727.01(c)         Steel Posts and Braces           620.41         WOOD BRACE FOR WOVEN WIRE FENCE         D         726.01         Timber Preservative           620.45 (2018)         PLANK RAIL         D         727.02(a)         Chain-Link Fabric           620.75 (2011)         SNOW BARRIER FENCE         APL         727.02(b)         Posts, Gate Frames, Rails, Braces an Miscellaneous Hardware           621.15 (2011)         SNOW BARRIER FENCE         APL         727.02(a)         Chain-Link Fabric           621.15 (2011)         PLANK RAIL         D         726.01         Timber Preservative           621.17         CABLE GUARDRAIL         D         727.02(b)         Now Barrier Fence           621.173 (2011)         CAB			D	726.01	Timber Preservative
America727.01(e)Gates620.30DRIVE GATE FOR WOVEN WIRE FENCEBuy America727.01(a)Woven Wire Fabric for Fencing and Gates620.40STEEL BRACE FOR WOVEN WIRE FENCEBuy America727.01(c)Gates620.41WOOD BRACE FOR WOVEN WIRE FENCED726.01Timber Preservative620.42WOOD BRACE FOR WOVEN WIRE FENCED726.01Timber Preservative620.43WOOD BRACE FOR WOVEN WIRE FENCED726.01Timber Preservative620.41WOOD BRACE FOR WOVEN WIRE FENCED726.01Timber Preservative620.45 (2018)PLANK RAILD727.02(a)Chain-Link Fabric620.75 (2011)SNOW BARRIERBuy America727.02(b)Posts, Gate Frames, Rails, Braces an Miscelianeous Hardware620.75 (2012)SNOW BARRIER FENCEAPL727.05Snow Barrier Fence621.15 (2011)PLANK RAILD728.01(c) (2011)Steel Posts and Post Accessories621.17CABLE GUARDRAILD728.03(a) (2011)Hardware for Cable, Steel Beam, an Thrie Beam Rail621.173 (2018)CABLE GUARDRAIL HOOK BOLT, GALVANIZEDD728.03(a) (2011)Hardware for Cable, Steel Beam, an Thrie Beam Rail621.174CABLE GUARDRAIL I-BOLT, GALVANIZEDD728.03(a) (2014)Hardware for Cable, Steel Beam, an Thrie Beam Rail621.174CABLE GUARDRAIL I-BOLT, GALVANIZEDD728.03(a) (2014)Hardware for Cable, Steel Beam, an Thrie Beam Rail621.174CABLE GUARDRAIL I-BOLT, GALVANIZEDD <td>620.26</td> <td rowspan="2">WOVEN WIRE WITH WOOD POSTS</td> <td>· ·</td> <td>727.01(a)</td> <td>Woven Wire Fabric for Fencing and Gates</td>	620.26	WOVEN WIRE WITH WOOD POSTS	· ·	727.01(a)	Woven Wire Fabric for Fencing and Gates
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Buy America         727.01(e) America         Gates           620.40         STEEL BRACE FOR WOVEN WIRE FENCE         Buy America         727.01(c)         Steel Posts and Braces           620.41         WOOD BRACE FOR WOVEN WIRE FENCE         D         726.01         Timber Preservative           620.41         WOOD BRACE FOR WOVEN WIRE FENCE         D         726.01         Timber Preservative           620.45 (2018)         PLANK RAIL         D         727.02(a)         Chain-Link Fabric           620.75 (2011)         SNOW BARRIER         Buy America         727.02(b)         Posts, Gate Frames, Rails, Braces an Miscellaneous Hardware           620.75 (2018)         SNOW BARRIER FENCE         API         727.05         Snowaus Hardware           621.15 (2011)         PLANK RAIL         D         727.05         Snowauser Frence           621.17         CABLE GUARDRAIL         D         728.01(b) (2018)         Steel Posts and Post Accessories           621.173 (2018)         CABLE GUARDRAIL HOOK BOLT, GALVANIZED         D         728.03(a) (2011)         Hardware for Cable, Steel Beam, an Thrie Beam Rail           621.173 (2018)         CABLE GUARDRAIL J-BOLT, GALVANIZED         D         728.03(a) (2011)         Hardware for Cable, Steel Beam, an Thrie Beam Rail           621.173 (2011)         CABLE GUARDRAIL J-BOLT, GALVAN	620.20		-	727.01(a)	Woven Wire Fabric for Fencing and Gates
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621.17       CABLE GUARDRAIL       D       728.03(a) (2018)       Hardware for Cable, Steel Beam, an Thrie Beam Rail         D       728.03(c) (2011)       Hardware for Cable, Steel Beam, an Thrie Beam Rail         621.173 (2018)       CABLE GUARDRAIL HOOK BOLT, GALVANIZED       D       728.03(a)       Hardware for Cable, Steel Beam, an Thrie Beam Rail         621.173 (2011)       CABLE GUARDRAIL J-BOLT, GALVANIZED       D       728.03(a)       Hardware for Cable, Steel Beam an Thrie Beam Rail         621.173 (2011)       CABLE GUARDRAIL J-BOLT, GALVANIZED       D       728.03(c)       Hardware for Cable, Steel Beam an Thrie Beam Rail         621.174       CABLE GUARDRAIL SPLICE UNIT       D       728.03(a) (2018)       Hardware for Cable, Steel Beam, an Thrie Beam Rail         621.174       CABLE GUARDRAIL SPLICE UNIT       D       728.03(c) (2011)       Thrie Beam Rail			D		
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621.173 (2018)     CABLE GUARDRAIL HOOK BOLT, GALVANIZED     D     728.03(a)     Thrie Beam Rail       621.173 (2011)     CABLE GUARDRAIL J-BOLT, GALVANIZED     D     728.03(c)     Hardware for Cable, Steel Beam and Thrie Beam Rail       621.174     CABLE GUARDRAIL SPLICE UNIT     D     728.03(a) (2018)     Hardware for Cable, Steel Beam, and Thrie Beam Rail       621.174     CABLE GUARDRAIL SPLICE UNIT     D     728.03(c) (2011)     Thrie Beam Rail			D	728.03(c) (2011)	Thrie Beam Rail
621.173 (2011)     CABLE GUARDRAIL J-BOLT, GALVANIZED     D     728.03(c)     Thrie Beam Rail       621.174     CABLE GUARDRAIL SPLICE UNIT     D     728.03(a) (2018)     Hardware for Cable, Steel Beam, an Thrie Beam Rail       621.174     D     728.03(c) (2011)     Thrie Deam Rail	621.173 (2018)	CABLE GUARDRAIL HOOK BOLT, GALVANIZED	D	728.03(a)	Thrie Beam Rail
621.174 CABLE GUARDRAIL SPLICE UNIT D 728.03(a) (2018) Thrie Beam Rail D 728.03(c) (2011) Thrie Beam Rail	621.173 (2011)	CABLE GUARDRAIL J-BOLT, GALVANIZED	D	728.03(c)	Thrie Beam Rail
D /28.03(C) (2011) Theie Been Beil	621.174	CABLE GUARDRAIL SPLICE UNIT			Hardware for Cable, Steel Beam, and Thrie Beam Rail Hardware for Cable, Steel Beam, and
	621.175	REPLACEMENT GUARDRAIL CABLE	D	728.03(c) (2011) 713.03	Wire Rope or Cable

	Pay Item and Certification Qu	uick Refe	erence	
Pay Item No.	Pay Item Name	Accept- ance Method	Material Specification No.	Material Name
		D	726.01	Timber Preservative
		D	728.01(a)	Wood Posts and Offset for Rail, Guardrail, Barriers and Guide Posts
621.18	STEEL BACKED TIMBER GUARDRAIL	D	728.02(d) (2018)	Steel Backed Timber Guardrail
021.10		D	728.02(f) (2011)	Steel Backed Timber Guardrail
		D	728.03(c) (2018)	Hardware for Steel Backed Timber Guardrail
		D	728.03(e) (2011)	Hardware for Steel Backed Timber Guardrail
		D	728.01(b) (2018)	Steel Posts and Post Accessories
		D	728.01(c) (2011)	Steel Posts and Post Accessories
621.20, 621.205,	STEEL BEAM GUARDRAIL, GALVANIZED; SBGR, GALV W/8FT	APL	728.01(c) (2018)	Alternative Blockouts
621.206, 621.207,	POSTS; SBGR, GALV /NESTED; SBGR, GALV /NESTED W/8FT	APL	728.01(d) (2011)	Alternative Blockouts
621.21, 621.215,	POSTS; HD SBGR, GALV.; HD SBGR, GALV. W/8FT POSTS; HD	D	728.02(b) (2018)	Steel Beam and Thrie Beam Rail
621.216	SBGR, GALV /NESTED; & HD SBGR, GALV /NESTED W/8FT	D	728.02(d) (2011)	Steel Beam and Thrie Beam Rail
021.210	POSTS; HD SBGR, GALV/NESTED.	D	728.03(a) (2018)	Hardware for Cable, Steel Beam, and Thrie Beam Rail Hardware for Cable, Steel Beam, and
(21,210,(2011)		D	728.03(c) (2011)	Thrie Beam Rail
621.218 (2011)	STEEL BEAM GUARDRAIL DELINEATOR	A	750.08	Retroreflective Sheeting
621.218 (2018)	TRAFFIC BARRIER DELINEATOR	A	750.08	Retroreflective Sheeting
621.219	STEEL BEAM GUARDRAIL OFFSET BLOCKS	APL	728.01(c) (2018)	Alternative Blockouts
		APL	728.01(d) (2011)	Alternative Blockouts
		D	728.01(b) (2018)	Steel Posts and Post Accessories
		D	728.01(c) (2011)	Steel Posts and Post Accessories
		APL	728.01(c) (2018)	Alternative Blockouts
		APL	728.01(d) (2011)	Alternative Blockouts
621.25	THRIE BEAM GUARDRAIL	D	728.02(b) (2018)	Steel Beam and Thrie Beam Rail Steel Beam and Thrie Beam Rail
		D D	728.02(d) (2011) 728.03(a) (2018)	Hardware for Cable, Steel Beam, and Thrie Beam Rail
		D	728.03(c) (2011)	Hardware for Cable, Steel Beam, and Thrie Beam Rail
		D	728.01(b) (2018)	Steel Posts and Post Accessories
		D	728.01(c) (2011)	Steel Posts and Post Accessories
C21 20		D	728.02(c) (2018)	Box Beam Rail
621.30	BOX BEAM GUARDRAIL	D	728.02(e) (2011)	Box Beam Rail
		D	728.03(b) (2018)	Hardware for Box Beam Rail
		D	728.03(d) (2011)	Hardware for Box Beam Rail
		D	728.01(c)	Steel Posts and Post Accessories
		APL	728.01(d)	Alternative Blockouts
621.35 (2011)	STEEL BEAM MEDIAN BARRIER	D	728.02(d)	Steel Beam and Thrie Beam Rail
		D	728.03(c)	Hardware for Cable, Steel Beam and Thrie Beam Rail
		D	728.01(c)	Steel Posts and Post Accessories
621.40 (2011)		APL	728.01(d)	Alternative Blockouts
	THRIE BEAM MEDIAN BARRIER	D	728.02(d)	Steel Beam and Thrie Beam Rail
		D	728.03(c)	Hardware for Cable, Steel Beam and Thrie Beam Rail
621.45 (2011)	CONCRETE MEDIAN BARRIER	APL	621.11	Delineation
· · · /		D	713.01	Bar Reinforcement
621.50 (2018)	MANUFACTURED TERMINAL SECTION, FLARED	APL	621.09(b)	Manufactured Terminal Section, Flared
621.50 (2011)	MANUFACTRUED TERMINAL SECTION, FLARED	APL	728.06	Manufactured Terminal Section
621.51 (2018)	MANUFACTURED TERMINAL SECTION, TANGENT	APL	621.09(a)	Manufactured Terminal Section, Tangent

Method         Specification No.           621.51 (2011)         MANUFACTURED TERMINAL SECTION, TANGENT         APL         728.02(b) (2010)         Steel Beam           621.53         TERMINAL CONNECTOR FOR STEEL BEAM GUARDRAIL         D         728.03(c) (2011)         Treman and the and		Pay Item and Certification Qu	iick Refe	erence	
621.53         TERMINAL CONNECTOR FOR STEEL BEAM GUARDRAIL         D         728.02(0) (2013)         Steel Beam           621.53         TERMINAL CONNECTOR FOR STEEL BEAM GUARDRAIL         D         728.03(c) (2011)         Hardware for           621.55 (2011)         MEDIAN BARRIER TERMINAL         D         728.03(c) (2011)         Hardware for           621.55 (2011)         ENERGY ABSORPTION ATTENUATOR         APL         728.03(c) (2011)         Hardware for           621.56 (2013)         ENERGY ABSORPTION ATTENUATOR         APL         728.03(c) (2011)         Hardware for           621.57 (2011)         ENERGY ABSORPTION ATTENUATOR, TEMPORARY         A         621.06(b)         Energy Abs           621.57 (2013)         ENERGY ABSORPTION ATTENUATOR, SAND-FILLED PLASTIC         APL         728.07         Energy Abs           621.59 (2011)         ENERGY ABSORPTION ATTENUATOR, PERMANENT         APL         621.06(a)         Energy Abs           621.61         ANCHOR FOR STEEL TO BOX BEAM TRANSITION         Bury         728.05         Conc           621.62         ANCHOR FOR CABLE RAIL         Bury         728.05         Conc           621.62         ANCHOR FOR CABLE RAIL         Bury         728.01(a)         Wood Posts an           621.61         ANCHOR FOR CABLE RAIL AT OPENINGS         Bury </th <th>Pay Item No.</th> <th>Pay Item Name</th> <th>ance</th> <th></th> <th>Material Name</th>	Pay Item No.	Pay Item Name	ance		Material Name
621.53         TERMINAL CONNECTOR FOR STEEL BEAM GUARDRAIL         D         728.02(d) (2011)         Steel Beam Hardware for D           621.53	621.51 (2011)	MANUFACTURED TERMINAL SECTION, TANGENT	APL		Manufactured Terminal Section
621.53         TERMINAL CONNECTOR FOR STEEL BEAM GUARDRAIL         D         728.03(a) (2018)         Hardware for Thr           621.55 (2011)         MEDIAN BARRIER TERMINAL         APL         728.03(c)         Manufactur or Thr           621.55 (2011)         ENERGY ABSORPTION ATTENUATOR         APL         728.07         Energy Abs           621.56 (2013)         ENERGY ABSORPTION ATTENUATOR, TEMPORARY         A         621.06(b)         Energy Abs           621.57 (2011)         ENERGY ABSORPTION ATTENUATOR, TEMPORARY         APL         728.07         Energy Abs           621.57 (2013)         ENERGY ABSORPTION ATTENUATOR, TEMPORARY         APL         728.07         Energy Abs           621.57 (2013)         ENERGY ABSORPTION ATTENUATOR, PERMANENT         APL         728.07         Energy Abs           621.60         ANCHOR FOR STEEL TO BOX BEAM TRANSITION         APL         728.06         Concr           621.61         ANCHOR FOR CABLE RAIL         Buy         728.05         Concr           621.62         ANCHOR FOR CABLE RAIL AT OPENINGS         Buy         728.01(a)         Wood Posts an           621.62 (2011)         ANCHOR FOR CABLE RAIL AT OPENINGS         Buy         728.01(a)         Wood Posts an           621.62 (2011)         ANCHOR FOR CABLE RAIL AT OPENINGS         D			D	728.02(b) (2018)	Steel Beam and Thrie Beam Rail
01133         TERMINE CONTECTOR STELL DOWN CONDUCT         D         728.03(c) (2011)         The draware for the section of th		TERMINAL CONNECTOR FOR STEEL BEAM GUARDRAIL	D	728.02(d) (2011)	Steel Beam and Thrie Beam Rail
621.55 (2011)         MEDIAN BARRIER TERMINAL         D         728.05 (2011)         Manufacture for T           621.55 (2011)         ENERGY ABSORPTION ATTENUATOR         APL         728.03 (C)         Hardware for T           621.56 (2018)         ENERGY ABSORPTION ATTENUATOR, TEMPORARY         A         621.06 (b)         Energy Abs           621.57 (2011)         ENERGY ABSORPTION ATTENUATOR, SAND-FILLED PLASTIC BARREL         APL         728.07         Energy Abs           621.575 (2018)         ENERGY ABSORPTION ATTENUATOR, PERMANENT         APL         728.07         Energy Abs           621.50 (2011)         ENERGY ABSORPTION ATTENUATOR, UQUID FILLED         APL         728.07         Energy Abs           621.60         ANCHOR FOR STEEL BEAM RAIL         Buy America         728.05         Conc           621.61         ANCHOR FOR STEEL DE ON BEAM TRANSITION         Buy America         728.05         Conc           621.65         ANCHOR FOR CABLE RAIL         Buy America         728.05         Conc           621.66 (2011)         ANCHOR FOR CABLE RAIL AT OPENINGS         Buy America         728.01(a)         Wood Posts an Collardrail, Bus           621.70 - 621.71         GUARDRAIL APPROACH SECTION, GALVANIZED TYPE I & II         D         728.01(a)         Wood Posts an Collardrail, Bus           621.72 - 621.73	621.53		D	728.03(a) (2018)	Hardware for Cable, Steel Beam, and Thrie Beam Rail
621.55 (2011)         MEDIAN BARRIER TERMINAL         D         728.03(c)         Hardware for T           621.56 (2011)         ENERGY ABSORPTION ATTENUATOR         APL         728.03(c)         Energy Abs           621.56 (2018)         ENERGY ABSORPTION ATTENUATOR, TEMPORARY         A         621.06(b)         Energy Abs           621.57 (2011)         ENERGY ABSORPTION ATTENUATOR, SAND-FILLED PLASTIC BARREL         APL         728.07         Energy Abs           621.575 (2018)         ENERGY ABSORPTION ATTENUATOR, PERMANENT         APL         621.06(a)         Energy Abs           621.60         ANCHOR FOR STEEL BEAM RAIL         Buy America         728.05         Conc           621.61         ANCHOR FOR STEEL TO BOX BEAM TRANSITION         Buy America         728.05         Conc           621.62         ANCHOR FOR CABLE RAIL AT OPENINGS         Buy America         728.01(a)         Wood Posts an Guardrail, B           621.66 (2011)         ANCHOR FOR CABLE RAIL AT OPENINGS         Buy America         728.01(a)         Wood Posts an Guardrail, B           621.70 - 621.71         GUARDRAIL APPROACH SECTION, GALVANIZED TYPE I & III         D         728.01(a)         Steel Posts : D         728.01(a)         Wood Posts an Guardrail, B           621.72, 621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOY         D			D	728.03(c) (2011)	Hardware for Cable, Steel Beam, and Thrie Beam Rail
621.56         Control         Control <thcontrol< th=""> <thcontrol< th=""> <thco< td=""><td></td><td></td><td>APL</td><td>728.06</td><td>Manufactured Terminal Section</td></thco<></thcontrol<></thcontrol<>			APL	728.06	Manufactured Terminal Section
621.56 (2018)         ENREGY ABSORPTION ATTENUATOR, TEMPORARY         A         621.06(b)         Energy Abs T           621.57 (2011)         ENREGY ABSORPTION ATTENUATOR, SAND-FILLED PLASTIC BARREL         APL         728.07         Energy Abs           621.57 (2013)         ENREGY ABSORPTION ATTENUATOR, PERMANENT         APL         621.06(a)         Penergy Abs           621.59 (2011)         ENERGY ABSORPTION ATTENUATOR, PERMANENT         APL         728.07         Energy Abs           621.60         ANCHOR FOR STEEL DEAM RAIL         Buy America         728.05         Conc           621.61         ANCHOR FOR STEEL TO BOX BEAM TRANSITION America         728.05         Conc           621.62         ANCHOR FOR CABLE RAIL         Buy America         728.05         Conc           621.66 (2011)         ANCHOR FOR CABLE RAIL AT OPENINGS         Buy America         728.01(b) (2018)         Steel Posts at D         728.01(c) (2011)         Steel Posts at D         728.01(c) (2011)         Steel Posts at D         728.01(c) (2011)         Steel Posts at Guardrail, Ba           621.70 - 621.71         GUARDRAIL APPROACH SECTION, GALVANIZED TYPE I & II         D         728.01(c) (2011)         Steel Posts at Guardrail, Ba           621.72, 621.72, 621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX         D         728.01(c) (2011)         Hardware					Hardware for Cable, Steel Beam and Thrie Beam
621.56 (2018)         ENERGY ABSORPTION ATTENUATOR, SAND-FILLED PLASTIC BARREL         APL         521.05(0)         T           621.57 (2011)         ENERGY ABSORPTION ATTENUATOR, SAND-FILLED PLASTIC BARREL         APL         728.07         Energy Abs Pergy Abs           621.575 (2018)         ENERGY ABSORPTION ATTENUATOR, PERMANENT         APL         621.06(a)         Energy Abs           621.59 (2011)         ENERGY ABSORPTION ATTENUATOR, PERMANENT         APL         728.07         Energy Abs           621.60         ANCHOR FOR STEEL TO BOX BEAM TRANSITION         Buy America         728.05         Conc           621.61         ANCHOR FOR STEEL TO BOX BEAM TRANSITION         Buy America         728.05         Conc           621.62         ANCHOR FOR CABLE RAIL         Buy America         728.05         Conc           621.62         ANCHOR FOR CABLE RAIL AT OPENINGS         Buy America         728.01(a)         Wood Posts an Guardrail, Ba           621.70 - 621.71         GUARDRAIL APPROACH SECTION, GALVANIZED TYPE I & II         D         728.01(a) (2018)         Steel Posts : D         728.01(a) (2011)         Steel Posts : D         728.01(a) (2011)         Steel Posts : D         728.01(a) (2011)         Hardware for Thr           621.72, 621.72, 621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX BEAM         D         728.01(a) (2011)	621.56 (2011)	ENERGY ABSORPTION ATTENUATOR	APL	728.07	Energy Absorption Attenuators
52.1.57 (2011)         BARREL         APL         728.07         Energy ABS           621.575 (2018)         ENERGY ABSORPTION ATTENUATOR, PERMANENT         APL         621.06(a)         Penergy ABS           621.59 (2011)         ENERGY ABSORPTION ATTENUATOR, LIQUID FILLED         APL         728.07         Energy ABS           621.60         ANCHOR FOR STEEL BEAM RAIL         Buy America         728.05         Conc           621.61         ANCHOR FOR STEEL TO BOX BEAM TRANSITION         Buy America         728.05         Conc           621.62         ANCHOR FOR CABLE RAIL         Buy America         728.05         Conc           621.66 (2011)         ANCHOR FOR CABLE RAIL AT OPENINGS         Buy America         728.05         Conc           621.70 - 621.71         GUARDRAIL APPROACH SECTION, GALVANIZED TYPE I & II         D         728.01(a)         Steel Posts : 0         728.01(a)         Steel Posts : 0         728.01(a)         Steel Posts : 0         Therware for 718.03(a) (2011)         Hardware for 718.03(a) (2011)         Hardware for 718.03(a) (2011)         Hardware for 728.01(b) (2013)         Steel Posts : 0         728.01(a)         Guardrail, Ba         Steel Posts : 0         728.01(a)         Steel Posts : 0         728.01(a)         Steel Posts : 0         728.01(b) (2013)         Steel Posts : 0         728.01(b) (2013)         Ste	621.56 (2018)	,	A	621.06(b)	Energy Absorption Attenuator, Temporary
522.375 (2018)         ENERGY ABSORPTION ATTENUATOR, PERMANENT         APL         621.06(a)         CP - p           621.59 (2011)         ENERGY ABSORPTION ATTENUATOR, LIQUID FILLED         APL         728.07         Energy Abs           621.60         ANCHOR FOR STEEL BEAM RAIL         Buy America         728.05         Conc           621.61         ANCHOR FOR STEEL TO BOX BEAM TRANSITION         Buy America         728.05         Conc           621.65         ANCHOR FOR CABLE RAIL         Buy America         728.05         Conc           621.66 (2011)         ANCHOR FOR CABLE RAIL         Buy America         728.05         Conc           621.66 (2011)         ANCHOR FOR CABLE RAIL AT OPENINGS         Buy America         728.01(a)         Wood Posts an Guardrail, Ba           621.70 - 621.71         GUARDRAIL APPROACH SECTION, GALVANIZED TYPE I & II         D         728.01(a)         Wood Posts an Guardrail, Ba           621.72, 621.72, 621.725, 621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAILBOY BEAM         D         728.01(a) (2011)         Hardware for Thr           621.72, 621.725, 621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAILBOY BEAM         D         728.01(a) (2011)         Hardware for Thr           621.72, 621.725, 621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAILBOY BEAM         D         7	621.57 (2011)		APL	728.07	Energy Absorption Attenuator
621.60         ANCHOR FOR STEEL BEAM RAIL         Buy America         728.05         Conc           621.61         ANCHOR FOR STEEL TO BOX BEAM TRANSITION         Buy America         728.05         Conc           621.65         ANCHOR FOR CABLE RAIL         Buy America         728.05         Conc           621.60         ANCHOR FOR CABLE RAIL         Buy America         728.05         Conc           621.61         ANCHOR FOR CABLE RAIL AT OPENINGS         Buy America         728.05         Conc           621.70 - 621.71         GUARDRAIL APPROACH SECTION, GALVANIZED TYPE I & II         D         728.01(a)         Wood Posts an Guardrail, Ba         D         728.01(b) (2018)         Steel Posts i D         728.02(b) (2018)         Steel Posts i D         Ther           621.70 - 621.71         GUARDRAIL APPROACH SECTION, GALVANIZED TYPE I & II         D         728.01(b) (2018)         Steel Posts i Guardrail, Ba         Steel Posts i D         728.02(b) (2018)         Steel Posts i Guardrail, Ba           621.72, 621.725, 621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOY BEAM         D         728.01(b) (2018)         Steel Posts i Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOY 728.01(b) (2018)         Steel Posts i Guardrail, Ba         D         728.01(b) (2018)         Steel Posts i Guardrail, Ba	621.575 (2018)	ENERGY ABSORPTION ATTENUATOR, PERMANENT	APL	621.06(a)	Energy Absorption Attenuator, Permanent
622.60         ANCHOR FOR STEEL BEAM RAIL         America         728.05         Conc           621.61         ANCHOR FOR STEEL TO BOX BEAM TRANSITION         Buy America         728.05         Conc           621.65         ANCHOR FOR CABLE RAIL         Buy America         728.05         Conc           621.66 (2011)         ANCHOR FOR CABLE RAIL AT OPENINGS         Buy America         728.01(a)         Wood Posts an Guardrail, Ba           621.70 - 621.71         GUARDRAIL APPROACH SECTION, GALVANIZED TYPE I & II         D         728.01(b) (2018)         Steel Posts: D         728.02(b) (2018)         Steel Posts: D         728.02(b) (2018)         Steel Posts: D         728.02(b) (2018)         Steel Posts: D         The The The The The The The The The The The	621.59 (2011)	ENERGY ABSORPTION ATTENUATOR, LIQUID FILLED	APL	728.07	Energy Absorption Attenuator
521.61         ANCHOR FOR STEEL TO BOX BEAM TRANSITION         America         728.05         Conc           621.65         ANCHOR FOR CABLE RAIL         Buy America         728.05         Conc           621.66 (2011)         ANCHOR FOR CABLE RAIL AT OPENINGS         Buy America         728.01(a)         Wood Posts an Guardrail, Ba           621.70 - 621.71         GUARDRAIL APPROACH SECTION, GALVANIZED TYPE I & II         D         728.01(b) (2018)         Steel Posts an D           621.72 - 621.71         GUARDRAIL APPROACH SECTION, GALVANIZED TYPE I & II         D         728.03(c) (2011)         Steel Posts an D           621.72 - 621.73         GUARDRAIL APPROACH SECTION, GALVANIZED TYPE I & II         D         728.03(c) (2011)         Steel Posts an Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX BEAM         D         728.03(c) (2011)         Hardware for Thr Thr           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX BEAM         D         728.01(a)         Wood Posts an Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX BEAM         D         728.01(b) (2018)         Steel Posts an Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX BEAM         D         728.01(b) (2018)         Steel Posts an Guardrail, Ba           621.	621.60	ANCHOR FOR STEEL BEAM RAIL	-	728.05	Concrete Anchors
621.65         ANCHOR FOR CABLE RAIL         America         728.05         Conc           621.66 (2011)         ANCHOR FOR CABLE RAIL AT OPENINGS         Buy America         728.05         Conc           621.66 (2011)         ANCHOR FOR CABLE RAIL AT OPENINGS         Buy America         728.01(a)         Wood Posts an Guardrail, Ba           621.70 - 621.71         GUARDRAIL APPROACH SECTION, GALVANIZED TYPE I & II         D         728.01(a)         Steel Posts a           621.72 - 621.71         GUARDRAIL APPROACH SECTION, GALVANIZED TYPE I & II         D         728.02(d) (2011)         Steel Posts a           621.72 - 621.72         GUARDRAIL APPROACH SECTION, GALVANIZED TYPE I & II         D         728.02(a) (2018)         Steel Posts a           621.72 - 621.725         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX         D         728.02(a) (2011)         Hardware for Thr           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX         D         728.01(a)         Wood Posts an Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX         D         728.01(a) (2011)         Steel Posts a           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX         D         728.01(a) (2011)         Steel Posts a           621.73         GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS	621.61	ANCHOR FOR STEEL TO BOX BEAM TRANSITION	· ·	728.05	Concrete Anchors
621.66 (2011)         ANCHOR FOR CABLE RAIL AT OPENINGS         America         728.05         Constraints           621.66 (2011)         ANCHOR FOR CABLE RAIL AT OPENINGS         America         728.01(a)         Wood Posts an Guardrail, Ba           621.70 - 621.71         GUARDRAIL APPROACH SECTION, GALVANIZED TYPE I & III         D         728.01(a)         Steel Posts :           621.72 - 621.71         GUARDRAIL APPROACH SECTION, GALVANIZED TYPE I & III         D         728.02(b) (2018)         Steel Posts :           621.72 - 621.72, 621.725, 621.725, 621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAILBON         D         728.01(a)         Wood Posts an Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAILBON         D         728.01(a)         Wood Posts an Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAILBON         D         728.01(a)         Wood Posts an Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAILBON         D         728.01(a)         Wood Posts an Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAILBON         D         728.01(a)         Steel Posts :           621.73         GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS         D         728.01(c) (2011)         Steel Posts :           621.73	621.65	ANCHOR FOR CABLE RAIL	-	728.05	Concrete Anchors
621.70 - 621.71         GUARDRAIL APPROACH SECTION, GALVANIZED TYPE I & II         D         728.01(b) (2018)         Steel Posts at           621.72, 621.73         GUARDRAIL APPROACH SECTION, GALVANIZED TYPE I & II         D         728.02(b) (2018)         Steel Beam           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED TYPE I & II         D         728.02(b) (2018)         Steel Beam           621.72, 621.725,         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX         D         728.03(c) (2011)         Hardware for Thr           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX         D         728.01(b) (2018)         Steel Posts at Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX         D         728.01(c) (2011)         Steel Posts at Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX         D         728.01(c) (2018)         Steel Posts at Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX         D         728.01(c) (2018)         Steel Posts at Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX         D         728.01(c) (2018)         Hardware Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALV HO SB; W/8FT POSTS         D         728.01(c) (2018) <td>621.66 (2011)</td> <td>ANCHOR FOR CABLE RAIL AT OPENINGS</td> <td>· ·</td> <td>728.05</td> <td>Concrete Anchors</td>	621.66 (2011)	ANCHOR FOR CABLE RAIL AT OPENINGS	· ·	728.05	Concrete Anchors
621.70 - 621.71         GUARDRAIL APPROACH SECTION, GALVANIZED TYPE I & II         D         728.01(c) (2011)         Steel Posts of D           621.70 - 621.71         GUARDRAIL APPROACH SECTION, GALVANIZED TYPE I & II         D         728.02(b) (2018)         Steel Beam           621.72, 621.725, 621.725, 621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOY         D         728.01(c) (2011)         Hardware for Thr           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOY         D         728.01(a)         Wood Posts an Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOY         D         728.01(c) (2011)         Steel Posts of Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOY         D         728.01(b) (2018)         Steel Posts of Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOY         D         728.01(b) (2018)         Steel Posts of Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS         D         728.01(b) (2018)         Hardware for Tot Steel Posts of Guardrail, Ba           621.737         GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS         D         728.01(b) (2018)         Steel Posts of APROACH SECTION, GALV HD SB; W/8FT POSTS				728.01(a)	Wood Posts and Offset Blocks for Rail, Guardrail, Barriers and Guide Posts
621.70 - 621.71         GUARDRAIL APPROACH SECTION, GALVANIZED TYPE I & II         D         728.02(b) (2018)         Steel Beam           D         728.03(a) (2011)         Steel Beam         Thr           D         728.03(a) (2018)         Hardware for           Thr         D         728.03(c) (2011)         Hardware for           B         728.03(c) (2011)         Hardware for         Thr           Hardware for         D         728.01(c) (2018)         Wood Posts an           GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX         D         728.01(b) (2018)         Steel Posts a           621.73         BEAM         D         728.02(c) (2011)         Steel Posts a           D         728.02(c) (2018)         Hardware         Bo         D         728.02(c) (2018)         Hardware           621.73         BEAM         D         728.01(b) (2018)         Steel Posts a         D         D         728.02(c) (2011)         Bo           D         728.02(c) (2011)         Be         D         D         728.02(c) (2011)         Bo           D         728.02(c) (2011)         Be         D         728.02(c) (2011)         Steel Posts a           621.73         GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS         D			D	728.01(b) (2018)	Steel Posts and Post Accessories
621.72, 621.725, 621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX BEAM         D         728.03(a) (2011)         Hardware for Thr           0         728.03(b) (2011)         Mardware for Thr         Mood Posts an Guardrail, Ba           621.72, 621.725, 621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX BEAM         D         728.01(b) (2018)         Steel Posts an Guardrail, Ba           0         728.02(c) (2011)         Steel Posts an Guardrail, Ba         D         728.01(b) (2018)         Steel Posts an Guardrail, Ba           621.73         BUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX BEAM         D         728.01(c) (2011)         Steel Posts an Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX BEAM         D         728.01(c) (2011)         Steel Posts an Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS         D         728.01(c) (2011)         Hardware Steel Posts an GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS           621.737, 621.738         GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS         D         728.01(c) (2011)         Altern APL           728.02(b) (2018)         Steel Beam D         728.02(b) (2018)         Steel Beam D         728.02(b) (2011)         Altern Hardware for			D	728.01(c) (2011)	Steel Posts and Post Accessories
621.72, 621.725, 621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOY BEAM         D         728.03(a) (2018)         Hardware for Thr BU           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOY BEAM         D         728.01(b) (2018)         Steel Posts an Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOY BEAM         D         728.01(b) (2018)         Steel Posts an Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOY BEAM         D         728.01(b) (2018)         Steel Posts an Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOY BEAM         D         728.01(c) (2011)         Steel Posts an GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOY BO           621.737, 621.738         GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS         D         728.01(c) (2011)         Steel Posts an GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS           621.737, 621.738         GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS         D         728.01(c) (2011)         Alterna Steel Beam           621.737, 621.738         GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS         D         728.02(c) (2011)         Steel Beam	621.70 - 621.71	GUARDRAIL APPROACH SECTION, GALVANIZED TYPE I & II	D		Steel Beam and Thrie Beam Rail
621.72, 621.725, 621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX BEAM         D         728.03(a) (2018)         Hardware for Thr           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX BEAM         D         728.01(b) (2018)         Steel Posts an Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX BEAM         D         728.02(c) (2011)         Steel Posts an Guardrail, Ba           621.73         GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS         D         728.03(b) (2018)         Hardware Bo           621.73         GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS         D         728.01(c) (2011)         Steel Posts an GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS           621.737, 621.738         GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS         D         728.02(c) (2018)         Steel Posts an GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS			D	728.02(d) (2011)	Steel Beam and Thrie Beam Rail
621.72, 621.725, 621.73         GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BO BEAM         D         728.01(a)         Wood Posts an Guardrail, Ba           0         728.01(b) (2018)         Steel Posts 3 0         728.01(c) (2011)         Steel Posts 3 0         728.01(c) (2011)         Steel Posts 3 0         728.02(c) (2018)         Steel Posts 3 0         728.02(c) (2011)         Steel Posts 3 0         728.02(c) (2011)         Steel Posts 3 0         728.03(b) (2018)         Hardware 0           0         728.03(b) (2018)         Hardware 0         728.03(b) (2018)         Hardware 0         Steel Posts 3 0         728.01(c) (2011)         Hardware 0           621.737, 621.738         GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS         D         728.01(c) (2011)         Steel Posts 3 0         728.01(c) (2011)         Steel Post			D	728.03(a) (2018)	Hardware for Cable, Steel Beam and Thrie Beam Rail
621.72, 621.725, 621.73         Cuardrail, APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX BEAM         D         728.01(b) (2018)         Steel Posts a           D         728.02(c) (2011)         Steel Posts a           D         728.02(c) (2018)         Beel Posts a           D         728.02(c) (2018)         Beel Posts a           D         728.02(c) (2018)         Beel Posts a           D         728.03(b) (2018)         Hardware           D         728.03(b) (2018)         Hardware           D         728.01(c) (2011)         Steel Posts a           D         728.03(b) (2018)         Hardware           D         728.01(c) (2011)         Hardware           D         728.01(c) (2011)         Steel Posts a           D         728.01(c) (2011)         Steel Posts a           D         728.01(c) (2011)         Steel Posts a           APL         728.01(c) (2011)         Alterna           APL         728.01(c) (2018)         Alterna           APL         728.02(b) (2018)         Steel Beam           D         728.02(b) (2018)         Steel Beam           D         728.02(b) (2011)         Steel Beam           D         728.02(b) (2011)         Steel Beam			D	728.03(c) (2011)	Hardware for Cable, Steel Beam and Thrie Beam Rail
621.72, 621.725,       GUARDRAIL APPROACH SECTION, GALVANIZED 2 & 4 RAIL BOX       D       728.01(c) (2011)       Steel Posts a         621.73       BEAM       D       728.02(c) (2018)       Bo         D       728.02(e) (2011)       Bo       Bo         D       728.02(e) (2011)       Bo       Bo         D       728.02(e) (2011)       Bo       Bo         D       728.03(b) (2018)       Hardware         D       728.03(b) (2011)       Hardware         D       728.01(c) (2011)       Steel Posts a         D       728.03(b) (2018)       Hardware         D       728.01(c) (2011)       Steel Posts a         D       728.01(c) (2011)       Steel Posts a         APL       728.01(c) (2011)       Alterna         APL       728.01(d) (2011)       Alterna         APL       728.02(b) (2018)       Steel Posts a         APL       728.01(d) (2011)       Alterna         APL       728.01(d) (2011)       Alterna         APL       728.02(b) (2018)       Steel Beam         D       728.02(d) (2011)       Steel Beam         D       728.02(d) (2011)       Steel Beam         D       728.02(d) (2011)       Steel			D	728.01(a)	Wood Posts and Offset Blocks for Rail, Guardrail, Barriers and Guide Posts
621.73       BEAM       D       728.03(1) (2011)       3tech 03.54         621.73       D       728.02(c) (2018)       Bo         D       728.02(e) (2011)       Bo         D       728.03(b) (2018)       Hardware         D       728.03(b) (2011)       Hardware         D       728.03(b) (2011)       Hardware         D       728.01(c) (2011)       Steel Posts at         D       728.01(c) (2011)       Steel Posts at         APL       728.01(c) (2011)       Alternation         621.737, 621.738       GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS       D       728.02(b) (2018)       Steel Beam         D       728.02(d) (2011)       Steel Beam       D       728.02(d) (2011)       Alternation			D	728.01(b) (2018)	Steel Posts and Post Accessories
621.737, 621.738       GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS       D       728.02(c) (2013)       Bo         621.737, 621.738       GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS       D       728.01(c) (2018)       Steel Posts a			D	728.01(c) (2011)	Steel Posts and Post Accessories
D         728.03(b) (2018)         Hardware           D         728.03(d) (2011)         Hardware           D         728.03(d) (2011)         Hardware           D         728.01(b) (2018)         Steel Posts a           D         728.01(c) (2011)         Steel Posts a           APL         728.01(c) (2011)         Alterna           APL         728.01(d) (2011)         Alterna           APL         728.01(d) (2011)         Alterna           D         728.02(b) (2018)         Steel Beam           D         728.02(d) (2011)         Steel Beam	621.73	BEAM	D	728.02(c) (2018)	Box Beam Rail
D         728.03(d) (2011)         Hardware           D         728.03(d) (2011)         Hardware           D         728.01(b) (2018)         Steel Posts a           D         728.01(c) (2011)         Steel Posts a           APL         728.01(d) (2011)         Alterna           APL         728.01(d) (2011)         Alterna           C         728.02(b) (2018)         Steel Beam           D         728.02(d) (2011)         Steel Beam           D         728.02(d) (2011)         Steel Beam			D	728.02(e) (2011)	Box Beam Rail
621.737, 621.738       GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS       D       728.01(b) (2018)       Steel Posts and APL         728.01(c) (2011)       Steel Posts and APL       728.01(c) (2018)       Alternation of APL         621.737, 621.738       GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS       D       728.02(b) (2018)       Steel Beam         D       728.02(b) (2011)       Steel Beam       D       728.02(c) (2011)       Steel Beam					Hardware for Box Beam Rail
D         728.01(c) (2011)         Steel Posts and APL           621.737, 621.738         GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS         D         728.01(d) (2011)         Alternation           621.737, 621.738         GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS         D         728.02(b) (2018)         Steel Beam           621.737, 621.738         GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS         D         728.02(b) (2018)         Steel Beam					Hardware for Box Beam Rail
621.737, 621.738         GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS         APL         728.01(c) (2018)         Alterna           D         728.02(b) (2018)         Steel Beam           Hardware for         Hardware for					Steel Posts and Post Accessories
621.737, 621.738         GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS         APL         728.01(d) (2011)         Alternation           D         728.02(d) (2011)         Steel Beam           D         728.02(d) (2011)         Steel Beam					Steel Posts and Post Accessories
621.737, 621.738 GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS D 728.02(b) (2018) Steel Beam D 728.02(d) (2011) Steel Beam					Alternative Blockouts
D 728.02(d) (2011) Steel Beam					Alternative Blockouts
Hardware for	621.737, 621.738	GUARDRAIL APPROACH SECTION, GALV HD SB; W/8FT POSTS			Steel Beam and Thrie Beam Rail
					Steel Beam and Thrie Beam Rail Hardware for Cable, Steel Beam and
D 728.03(c) (2011) Hardware for					Thrie Beam Rail Hardware for Cable, Steel Beam and Thrie Beam Rail

	Pay Item and Certification Qu	uick Refe	erence	
Pay Item No.	Pay Item Name	Accept- ance Method	Material Specification No.	Material Name
		D	728.01(a)	Wood Posts and Offset Blocks for Rail, Guardrail, Barriers and Guide Posts
		D	728.01(b) (2018)	Steel Posts and Post Accessories
621.746, 621.747,	GUARDRAIL APPROACH SECTION TO CONCRETE BRIDGE RAIL, TL-2; TL-3; & COMB BRIDGE RAIL TL-3	D	728.01(c) (2011)	Steel Posts and Post Accessories
621.748		D	728.02(b) (2018)	Steel Beam and Thrie Beam Rail
021.740		D	728.02(d) (2011)	Steel Beam and Thrie Beam Rail
		D	728.03(a) (2018)	Hardware for Cable, Steel Beam and Thrie Beam Rail
		D	728.03(c) (2011)	Hardware for Cable, Steel Beam and Thrie Beam Rail
621.75	REMOVE AND RESET GUARDRAIL	D	728.03(a) (2018)	Hardware for Cable, Steel Beam and Thrie Beam Rail
		D	728.03(c) (2011)	Hardware for Cable, Steel Beam and Thrie Beam Guardrail
621.76	REPLACE GUARDRAIL POST ASSEMBLY	D	728.01(b) (2018)	Steel Posts and Post Accessories
		D	728.01(c) (2011)	Steel Posts and Post Accessories
621.77	REPLACE GUARDRAIL BEAM UNIT	D	728.02(b) (2018)	Steel Beam and Thrie Beam Rail
		D	728.02(d) (2011)	Steel Beam and Thrie Beam Rail
621.85	GUIDE POSTS	D	728.01(b) (2018)	Steel Posts and Post Accessories
		D	728.01(c) (2011)	Steel Posts and Post Accessories
626.20 (2011)	WELL CASING PIPE	Buy America	741.01	Well Casing
628.22 (2011)	REINFORCED CONCRETE SEWER PIPE	Buy America	710.01	Reinforced Concrete Pipe
628.25 (2011)	CAST IRON SOIL PIPE, EXTRA HEAVY	Buy America	715.03	Cast Iron Pipe
628.26 (2011)	CAST IRON PIPE, CEMENT-LINED	Buy America	715.03	Cast Iron Pipe
628.28	DUCTILE IRON SEWER PIPE, CEMENT-LINED	Buy America	740.07	Ductile Iron Pipe, Cement-Lined
629.20	ADJUST ELEVATION OF VALVE BOX	Buy America	715.01	Iron Casting
629.24	DUCTILE IRON PIPE, CEMENT-LINED	Buy America	740.07	Ductile Iron Pipe, Cement-Lined
620.25		Buy America	629.25 (2018)	Extension Service Box and Curb Stop
629.25	EXTENSION SERVICE BOX AND CURB STOP	Buy America	740.09 (2011)	Extension Service Box, Cast Iron
620.26		Buy America	629.26(2018)	Gate Valve
629.26	GATE VALVE	Buy America	740.11 (2011)	Gate Valves
620.27		Buy America	629.27 (2018)	Gate Valve with Valve Box
629.27	GATE VALVE WITH VALVE BOX	Buy America	740.11 (2011)	Gate Valves
629.28	HYDRANT	Buy America	629.28 (2018)	Hydrant
029.28		Buy America	740.13 (2011)	Hydrant
629.34 (2011)	STEEL WATER PIPE, GALVANIZED	Buy America	740.05	Steel Pipe, Galvanized
629.35	TAPPING SLEEVE AND VALVE WITH VALVE BOX	Buy America	629.35	Tapping Sleeve and Valve with Valve Box

		A		
Pay Item No.	Pay Item Name	Accept- ance Method	Material Specification No.	Material Name
646 201 646 221	4, 6, 8, and 12 INCH WHITE and YELLOW LINE, 24 INCH STOP BAR, LETTER OR SYMBOL, CROSSWALK MARKING, RR CROSSING	ANDPMB L	708.08(c) (2018)	Waterborne Traffic Paint
646.201-646.321		ANDPMB	708.08(d) (2011)	Waterborne Traffic Paint
	SYMBOL	APL	754.01(a)	Optics, Type I
		APL	708.08(a)	Polyurea Pavement Marking
		APL	708.08(b) (2018)	Epoxy Paint
		APL	708.08(c) (2011)	Epoxy Paint
		APL	754.01(a)	Optics, Type I
		APL	754.01(b)	Optics, Type II
		APL	754.01(c)	Optics, Type III
		APL	708.10(a)	Thermoplastic Pavement Marking Type A
646.400-646.479	DUPARIE 4, 6, 8, and 12 INCH WHITE and VELLOW LINE	APL	708.11(a) (2018)	Pavement Marking Tape, Type A
0+0.400-040.479	DURABLE 4, 6, 8, and 12 INCH WHITE and YELLOW LINE	APL	708.12(a) (2011)	Pavement Marking Tape, Type A
		APL	754.03(a) (5/22/19)	Pavement Marking Tape, Type A
		APL	708.11(b) (2018)	Pavement Marking Tape, Type E
		APL	708.12(b) (2011)	Pavement Marking Tape, Type E
		APL	754.03(b) (5/22/19)	Pavement Marking Tape, Type E
		APL	708.11(c) (2018)	Pavement Marking Tape, Type C
		APL	708.12(c) (2011)	Pavement Marking Tape, Type (
	DURABLE 4, 6, 8, and 12 INCH WHITE and YELLOW LINE, POLYUREA and RECESSED POLYUREA	APL	708.08(a)	Polyurea Pavement Marking
		APL	754.01(a)	Optics, Type I
646.400-646.479		APL	754.01(b)	Optics, Type II
		APL	754.01(c)	Optics, Type III
		APL	708.08(b) (2018)	Epoxy Paint
		APL	708.08(c) (2011)	Epoxy Paint
646.400-646.479	DURABLE 4, 6, 8, and 12 INCH WHITE and YELLOW LINE, EPOXY	APL	754.01(a)	Optics, Type I
	PAINT and RECESSED EPOXY PAINT	APL	754.01(b)	Optics, Type II
		APL	754.01(c)	Optics, Type III
646.400-646.479 (2011)	DURABLE 4, 6, 8, and 12 INCH WHITE and YELLOW LINE, METHYL-METHACRYLATE and RECESSED METHYL- METHACRYLATE	APL	708.08(e)	Methyl-methacrylate Paint
		APL	754.01(a)	Optics, Type I
646.400-646.479	DURABLE 4, 6, 8, and 12 INCH WHITE and YELLOW LINE,	APL	754.01(b)	Optics, Type II
(2011)	THERMOPLASTIC and RECESSED THERMOPLASTIC	APL	754.01(c)	Optics, Type III
(2022)		APL	708.10(a)	Thermoplastic Pavement Marking Type A
		APL	708.11(a) (2018)	Pavement Marking Tape, Type A
646.400-646.479	DURABLE 4, 6, 8, and 12 INCH WHITE and YELLOW LINE, TYPE A	APL	708.12(a) (2011)	Pavement Marking Tape, Type A
5 10.700 070.47 <i>3</i>	TAPE and RECESSED TYPE A TAPE	APL	754.03(a) (5/22/19)	Pavement Marking Tape, Type A
		APL	708.11(b) (2018)	Pavement Marking Tape, Type E
	DURABLE 4, 6, 8, and 12 INCH WHITE and YELLOW LINE, TYPE B	APL	708.12(b) (2011)	Pavement Marking Tape, Type E
646.400-646.479	TAPE and RECESSED TYPE B TAPE	APL	754.03(b) (5/22/19)	Pavement Marking Tape, Type E
	DURABLE 4, 6, 8, and 12 INCH WHITE and YELLOW LINE, TYPE C	APL	708.11(c) (2018)	Pavement Marking Tape, Type C
646.400-646.479	TAPE and RECESSED TYPE C TAPE	APL	708.12(c) (2011)	Pavement Marking Tape, Type (

Pay Item and Certification Quick Reference				
Pay Item No.	Pay Item Name	Accept- ance Method	Material Specification No.	Material Name
646.480-646.599		APL	708.08(a)	Polyurea Pavement Marking
		APL	708.08(b) (2018)	Epoxy Paint
		APL	708.08(c) (2011)	Epoxy Paint
		APL	754.01(a)	Optics, Type I
	DURABLE 24 INCH STOP BAR, LETTER OR SYMBOL, CROSSWALK MARKING, and RAILROAD CROSSING SYMBOL	APL	754.01(b)	Optics, Type II
		APL	754.01(c)	Optics, Type III
		APL	708.10(b)	Thermoplastic Pavement Markings, Type B
		APL	708.11(c) (2018)	Pavement Marking Tape, Type C
		APL	708.12(c) (2011)	Pavement Marking Tape, Type C
		APL	708.11(d) (2018)	Pavement Marking Tape, Type D
		APL	708.12(d) (2011)	Pavement Marking Tape, Type D
		APL	754.03(b)	Pavement Marking Tape, Type B
			(5/22/19)	Delaure Devene est Markin e
	DURABLE 24 INCH STOP BAR, LETTER OR SYMBOL, CROSSWALK	APL	708.08(a)	Polyurea Pavement Marking
646.480-646.599	MARKING, and RAILROAD CROSSING SYMBOL, POLYUREA and	APL	754.01(a)	Optics, Type I
	RECESSED POLYUREA	APL	754.01(b)	Optics, Type II
		APL	754.01(c)	Optics, Type III
		APL	708.08(b) (2018)	Epoxy Paint
	DURABLE 24 INCH STOP BAR, LETTER OR SYMBOL, CROSSWALK		708.08(c) (2011)	Epoxy Paint
646.480-646.599	MARKING, and RAILROAD CROSSING SYMBOL, EPOXY PAINT	APL	754.01(a)	Optics, Type I
	and RECESSED EPOXY PAINT	APL	754.01(b)	Optics, Type II
		APL	754.01(c)	Optics, Type III
646.480-646.599 (2011)	DURABLE 24 INCH STOP BAR, LETTER OR SYMBOL, CROSSWALK MARKING, and RAILROAD CROSSING SYMBOL, METHYL- METHACRYLATE and RECESSED METHYL-METHACRYLATE	APL	708.08(e)	Methyl-methacrylate Paint
646.480-646.599	DURABLE 24 INCH STOP BAR, LETTER OR SYMBOL, CROSSWALK MARKING, and RAILROAD CROSSING SYMBOL, THERMOPLASTIC and RECESSED THERMOPLASTIC		708.10(b)	Thermoplastic Pavement Markings, Type B
646.4071-646.5171	DURABLE (PAVEMENT MARKINGS), TYPE A TAPE	APL	754.03(a)	Pavement Marking Tape, Type A
646.4072-646.5172	DURABLE (PAVEMENT MARKINGS), TYPE B TAPE	APL	754.03(b)	Pavement Marking Tape, Type B
646.6012-646.7012	TEMPORARY (PAVEMENT MARKINGS), TYPE C TAPE	APL	754.03(c)	Pavement Marking Tape, Type C
	PAINTED CURB	APL	754.01(a)	Optics, Type I
646.81		ANDPMBL	708.08(c) (2018)	Waterborne Traffic Paint
		ANDPMBL	708.08(d) (2011)	Waterborne Traffic Paint
CAC 00		ANDPMBL	708.08(c) (2018)	Waterborne Traffic Paint
646.82	PAINTED ISLAND	ANDPMBL	708.08(d) (2011)	Waterborne Traffic Paint
CAC 02		APL	708.12(d) (2018)	Pavement Marking Mask
646.86	PAVEMENT MARKING MASK	APL	708.13(d) (2011)	Pavement Marking Mask
<u></u>		APL	720.02 (2018)	Geotextile for Roadbed Separator
649.11	GEOTEXTILE FOR ROADBED SEPARATOR	D	720 (2011)	Geotextiles
649.21	GEOTEXTILE UNDER RAILROAD BALLAST	APL	720.03 (2018)	Geotextile Under Railroad Ballast
		D	720 (2011)	Geotextiles
		APL	720.04 (2018)	Geotextile Under Stone Fill
649.31	GEOTEXTILE UNDER STONE FILL	D	720 (2011)	Geotextiles
649.41	GEOTEXTILE FOR UNDERDRAIN TRENCH LINING	APL	. ,	Geotextile for Underdrain Trench Linin
		D	720 (2011)	Geotextiles
649.51 (2011)	GEOTEXTILE FOR SILT FENCE	D	720	Geotextiles

Accept-						
Pay Item No.	Pay Item Name	ance Method	Material Specification No.	Material Name		
649.515 (2011)	GEOTEXTILE FOR SILT FENCE, WOVEN WIRE REINFORCED	D	720	Geotextiles		
649.61		APL	720.06 (2018)	Geotextile for Filter Curtain		
	GEOTEXTILE FOR FILTER CURTAIN	D	720 (2011)	Geotextiles		
(51.20/2014)	HYDRAULIC MULCH	APL	755.10(d)	Fiber Mulch		
651.28 (2011)	HTDRAULIC MOLCH	APL	755.10(e)	Hydraulic Matrix		
653.10 (2011)	TACKIFIER	APL	755.10(f)	Tackifier		
653.11 (2018)	HYDRAULIC MULCH	APL	755.10(d)	Fiber Mulch		
055.11 (2018)	HTDRAGEIC MOLCH	APL	755.10(e)	Hydraulic Matrix		
653.25 (2011)	TEMPORARY STONE CHECK DAM, TYPE I	D	720	Geotextiles		
653.25 (2018)	CHECK DAM, TYPE I	APL	720.04	Geotextile Under Stone Fill		
653.26 (2011)	TEMPORARY STONE CHECK DAM, TYPE II	D	720	Geotextiles		
653.30 (2011)	PREFABRICATED CHECK DAM	APL	720.05	Prefabricated Check Dam		
653.30 (2018)	CHECK DAM, TYPE III	APL	653.30	Check Dam, Type III		
653.35 (2011)	VEHICLE TRACKING PAD	D	720	Geotextiles		
653.35 (2018)	STABILIZED CONSTRUCTION ENTRANCE	APL	720.04	Geotextile Under Stone Fill		
653.41 (2011)	INLET PROTECTION DEVICE, TYPE II	APL	720.06	Inlet Protection Device, Type II		
653.41 (2018)	INLET PROTECTION DEVICE, TYPE II	APL	653.09(b)(2)	Inlet Protection Device, Type II		
653.45 (2011)	FILTER BAG	APL	720.07	Filter Bag		
653.45 (2018)	FILTER BAG	APL	653.09(c)	Filter Bag		
653.475 (2018)	SILT FENCE, TYPE I	APL	720.07	Geotextile For Silt Fence		
653.476 (2018)	SILT FENCE, TYPE II	APL	720.07	Geotextile For Silt Fence		
660.20 (2011)	TIMBER PAINTING, FIRE RETARDANT	APL	708.05(c)	Fire Retardant		
660.30 (2011)	TIMBER PAINTING, INSECTICIDE/FUNGICIDE	APL	708.05(b)	Insecticide/fungicide		
661.10 (2011)	METAL ROOFING	Buy America	715.06	Metal Roofing		
675.20	TRAFFIC SIGN, TYPE A	A	750.08	Retroreflective Sheeting		
675.21	TRAFFIC SIGN, TYPE B	A	750.08	Retroreflective Sheeting		
675.301 (2011)	FLANGED CHANNEL SIGN POST	D	750.01(a)(2)	Steel Posts and Anchors		
675.31	W-SHAPE STEEL SIGN POST	D	714.05	High-Strength Bolts, Nuts and Washe		
075.51		D	750.01(a)	Steel Posts and Anchors		
675.32	TUBULAR ALUMINUM SIGN POST	D	750.01(b)	Aluminum Post		
		D	714.02	Structural Steel		
675.33	TUBULAR STEEL SIGN POST	D	714.05	High-Strength Bolts, Nuts and Washe		
		D	750.01(a)(1)	Steel Posts and Anchors		
675.341	SQUARE TUBE SIGN POST AND ANCHOR	D	750.01(a)(3)	Steel Posts and Anchors		
675.35 (2018)	SOIL BEARING SLIP BASE	APL	675.05	Slip Bases		
		D	713.01	Bar Reinforcement		
675.41, 675.42	FOUNDATION FOR W-SHAPE STEEL POST 24 INCH and 30 INCH	D	750.01(a) (10/22/2019)	Steel Posts and Anchors		
675.43	FOUNDATION FOR TUBULAR STEEL POST	D	713.01 (10/22/2019)	Bar Reinforcement		
		D	750.01(a)(1)	Steel Posts and Anchors		
		Α	750.08	Retroreflective Sheeting		
676.10	DELINEATOR WITH STEEL POST	Buy America	751.01(a)	Steel Posts and Anchors		
676.15 (2011)	REMOVE AND REPLACE REFLECTOR	A	750.08	Retroreflective Sheeting		
676.15 (2018)	REMOVE AND REPLACE DELINEATOR	A	750.08	Retroreflective Sheeting		
676.20	DELINEATOR WITH FLEXIBLE POST	А	750.08	Retroreflective Sheeting		

	Pay Item and Certification Qu	iick Refe	erence	
Pay Item No.	Pay Item Name	Accept- ance Method	Material Specification No.	Material Name
677.12 & 677.13		D	714.11	Steel Tubing
		APL	707.03	Mortar, Type IV
		D	713.01	Bar Reinforcement
	OVERHEAD TRAFFIC SIGN SUPPORT, CANTILEVER & OVERHEAD TRAFFIC SIGN SUPPORT, MULTI-SUPPORT	D	714.04	Carbon Steel Bolts, Nuts and Washers
		D	714.05	High-Strength Bolts, Nuts and Washers
		D	714.09	Anchor Bolts, Traffic Signals, Lighting and Overhead Structures
		Buy America	752.15	Grounding Electrodes
		D	714.11	Steel Tubing
		APL	707.03	Mortar, Type IV
		D	713.01	Bar Reinforcement
		D	714.04	Carbon Steel Bolts, Nuts and Washers
	OVERHEAD TRAFFIC SIGN SUPPORT, CANTILEVER WITH	D	714.05	High-Strength Bolts, Nuts and Washers
677.22, 677.23 & 677.25	LIGHTING & OVERHEAD TRAFFIC SIGN SUPPORT, MULTI- SUPPORT WITH LIGHTING, REMOVE AND RESET OVERHEAD	D	714.09	Anchor Bolts, Traffic Signals, Lighting and Overhead Structures
	TRAFFIC SIGN SUPPORT	Buy America	752.15	Grounding Electrodes
		APL	753.05 (2018)	Luminaires
		Α	753.10 (2011)	Luminaires
		A	679.10 (2018)	Street Lighting Control Device
		A	753.12 (2011)	Street Light Control Device
		D	713.01	Bar Reinforcement
		D	714.05	High-Strength Bolts, Nuts and Washers
	TRAFFIC CONTROL SIGNAL SYSTEM, INTERSECTION	D	714.09	Anchor Bolts, Traffic Signals, Lighting and Overhead Structures
678.15		D	752.03(a)	Steel Poles and Baseplates
078.15		D	752.03(b)	Cantilever Mast Arms
		Buy America	752.06	Traffic Signal Controllers
		Buy America	752.15	Grounding Electrodes
	FLASHING BEACON, GROUND MOUNTED	Buy America	713.01	Bar Reinforcement
		D	752.01(a)(1)	Steel Posts
678.16		Buy	752.01(b)(1)	Cast Iron Bases
		America Buy	752.07	Flashing Beacons
		America Buy	752.15	Grounding Electrodes
	FLASHING BEACON, AERIAL MOUNTED	America Buy	713.01	Bar Reinforcement
		America Buy	752.02(b)	Steel Poles and Base Plates
678.17		America Buy	752.02(0)	Span Wire
		America Buy		
		America Buy	752.07	Flashing Beacons
		America	752.15	Grounding Electrodes

Pay Item and Certification Quick Reference				
Pay Item No.	Pay Item Name	Accept- ance Method	Material Specification No.	Material Name
678.20	INTERCONNECTING CABLE	Buy America	752.04	Span Wire
678.25, 678.27	PULL BOX, STANDARD; PULL BOX, DOUBLE	Buy America	752.12(a)	Pull Box
	STREET LIGHT ASSEMBLY	D	713.01	Bar Reinforcement
		D	714.09	Anchor Bolts, Traffic Signals, Lighting and Overhead Structures
679.46		Buy America	752.15	Grounding Electrodes
		D	753.04(a) (2018)	Bracket Arm, Aluminum
		D	753.04(b) (2018)	Bracket Arm, Steel
		APL	753.05 (2018)	Luminaires
		А	753.10 (2011)	Luminaires
679.47	BRACKET ARM	D	753.04(a) (2018)	Bracket Arm, Aluminum
679.47		D	753.04(b) (2018)	Bracket Arm, Steel
679.50	LUMINAIRE	APL	753.05 (2018)	Luminaires
679.50		А	753.10 (2011)	Luminaires
679.54	STREET LIGHTING CONTROL DEVICE	А	679.10 (2018)	Street Lighting Control Device
079.34		А	753.12 (2011)	Street Light Control Device
679.55	POWER DROP STANCHION, STREET LIGHTING	Buy America	752.15	Grounding Electrodes
680.20	TRAVEL INFORMATION SIGN	А	750.08	Retroreflective Sheeting
680.25	BUSINESS DIRECTIONAL SIGN	А	750.08	Retroreflective Sheeting
680.72	OVERLAY FOR TRAVEL INFORMATION SIGN	А	750.08	Retroreflective Sheeting