

QA FREQUENCY GUIDE SCHEDULE for Minimum Materials Sampling, Testing, and Inspection

PAY ITEM	TYPE OF TEST	PROJECT VERIFICATION SAMPLING & TESTING FREQUENCY	PROCEDURES		REMARKS	POINT OF VERIFICATION FOR QUALITY DETERMINATION	CENTRAL LAB (CL) [LOCAL AGENCIES ARE TO USE AN ACCREDITED LAB, NOT CDOT CL]		
			PROJECT VERIFICATION SAMPLING	PROJECT VERIFICATION TESTING			TEST FREQUENCY	SAMPLE SIZE	
EMBANKMENT	203 IN-PLACE DENSITY / PERCENT RELATIVE COMPACTION	1 per 2,000 cu yds. or fraction thereof of testable material as described in Subsection 203.07 of CDOT Standard Specifications. DENSITY: 1 per 500 cu. yds. when within 100 ft. of Bridge Approach(s).		CP 80 CP 25	CP 25 for 1-point check requirements or as required . Report on CDOT Form #212; including where roller hours only are specified. See FMM (Chapter 200) for further details.	In the compacted lift.			
	MOISTURE-DENSITY CURVE	1 per soil type.		CP 23 T 99	Report on CDOT Form #24.		Moisture-Density Curve and Soil-Survey shall be performed on the soil found at the proposed profile grade in the Field Lab or the Region Lab. 1 - R value test, per general soil type. (per CP-L 3101)	33 lb.(15 kg) -#4 If the criteria are met for CP 24, Section 4.1, use Form #564 to classify the material. Keep the material segregated & submit the -#4, +#4, and +3/8" rock.	
	SOIL-SURVEY (CLASSIFICATION)	1 per 1,000 lin. ft. of two-lane roadway or fraction thereof.	CP 20 CP 24	CP 21 M 145 T 89 T 90 CPL 3101	Use AASHTO M 145 for soil classification . Report on CDOT Form #219.	In the top 2 ft. (600 mm) of the finished subgrade.			
	WATER-SOLUBLE SULFATE ION * / **	1 per 2,000 cu yds. or fraction thereof. Minimum 1 per source.	CP 30	CPL 2103	Report on CDOT Form #212 or #323.	From uncompacted lift or stockpile.		1 water-soluble sulfate, water-soluble chloride, resistivity, and pH test per source. (see NOTE 1)	5 lb. (3 kg) per soil type.
	WATER-SOLUBLE CHLORIDE ION **	1 per 2,000 cu yds. or fraction thereof. Minimum 1 per source.	CP 30	CPL 2104	See Chapter 200, Soil Survey / Preliminary Soil Profile.				
	RESISTIVITY **	1 per 2,000 cu yds. or fraction thereof. Minimum 1 per source.	CP 30	G 57	* Sulfate test required for fill around concrete structures. ** For pipe backfill these tests may be required based on the pipe material type.				
	pH **	1 per 2,000 cu yds. or fraction thereof. Minimum 1 per source.	CP 30	G 51	See Subsection 203.03 (a).				

NOTE 1: This Central Lab test can be performed in the Region Lab or the Field Lab if adequate facilities and equipment are available.

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			PROJECT VERIFICATION SAMPLING	PROJECT VERIFICATION TESTING			TEST FREQUENCY	SAMPLE SIZE
206 STRUCTURAL BACKFILL (CLASS 1 & CLASS 2)	GRADATION	1 per 200 cu. yds. or fraction thereof.	CP 30	CP 31	Report on CDOT Form #6.	In-Place, before compaction.	1 per source, per project. (see NOTE 1)	110 lb. (45 kg) is approx. 2 bags by volume for Class 1,
	ATTERBERG LIMITS	1 per 200 cu. yds. or fraction thereof.		T 89 T 90			1 per source, per project. (see NOTE 1)	
	IN-PLACE DENSITY / PERCENT RELATIVE COMPACTION	1 per 200 cu. yds. or fraction thereof. Minimum 1 per structure.		CP 80 / CP 25	Report on CDOT Form #6. See FMM, Chap. 200, Item 206 Structure Backfill, Note on rocky material. CP 25 for 1-point check requirements or as required. Report on CDOT Form #24.	In the compacted lift.		
	MOISTURE-DENSITY CURVE	If in roadbed, 1 per source.		CP 23 T 99 or T 180	Class 1: T 180 Class 2: T 99 or T 180, depending on soil type.		1 per source, per project. (see NOTE 1)	
	WATER-SOLUBLE SULFATE ION * / **	1 per 2,000 cu yds. or fraction thereof. Minimum 1 per source.	CP 30	CPL 2103	Report on CDOT Form #212 or #323. See Chapter 200, Soil Survey / Preliminary Soil Profile.	From uncompacted lift or stockpile.	1 water-soluble sulfate, water-soluble chloride, resistivity, and pH test per source. (see NOTE 1)	
	WATER-SOLUBLE CHLORIDE ION **	1 per 2,000 cu yds. or fraction thereof. Minimum 1 per source.	CP 30	CPL 2104	* Sulfate test required for fill around concrete structures. ** For pipe backfill these tests may be required based on the pipe material type. See Subsection 206.02 (a).			
	RESISTIVITY **	1 per 2,000 cu yds. or fraction thereof. Minimum 1 per source.	CP 30	G 57				
	pH **	1 per 2,000 cu yds. or fraction thereof. Minimum 1 per source.	CP 30	G 51				

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			PROJECT VERIFICATION SAMPLING	PROJECT VERIFICATION TESTING			TEST FREQUENCY	SAMPLE SIZE
206 BED COURSE MATERIAL	GRADATION	1 per 200 cu. yds. or fraction thereof.	CP 30	CP 31	Report on CDOT Form #6.	In-Place.	1 per source, per project. (see NOTE 1)	55 lb. (25 kg)
	ATTERBERG LIMITS	1 per 200 cu. yds. or fraction thereof.		T 89 T 90			1 per source, per project. (see NOTE 1)	
	IN-PLACE DENSITY / PERCENT RELATIVE COMPACTION	1 per 200 cu. yds. or fraction thereof. Minimum 1 per structure in roadbed.		CP 80 / CP 25	Report on CDOT Form #6. See FMM, Chap. 200, Item 206 Structure Backfill, Note on rocky material. CP 25 for 1-point check requirements or as required. Reference ** below.	In the compacted lift.		
	MOISTURE-DENSITY CURVE	If in roadbed, 1 per source.		CP 23 T 180	Report on CDOT Form #24. ** Required only when placed under sidewalk, bikeways and curb & gutter.			
	WATER-SOLUBLE SULFATE ION * / **	1 per 2,000 cu yds. or fraction thereof. Minimum 1 per source.	CP 30	CPL 2103	Report on CDOT Form #212 or #323. See Chapter 200, Soil Survey / Preliminary Soil Profile.	From uncompacted lift or stockpile.		
	WATER-SOLUBLE CHLORIDE ION **	1 per 2,000 cu yds. or fraction thereof. Minimum 1 per source.	CP 30	CPL 2104				
	RESISTIVITY **	1 per 2,000 cu yds. or fraction thereof. Minimum 1 per source.	CP 30	G 57	* Sulfate test required for fill around concrete structures. ** For pipe backfill these tests may be required based on the pipe material type. See Subsection 206.02 (a).			
pH **	1 per 2,000 cu yds. or fraction thereof. Minimum 1 per source.	CP 30	G 51					
206 FILTER MATERIAL	GRADATION	1 per 200 cu. yds. or fraction thereof for each Class.	CP 30	CP 31	Report on CDOT Form #6. See FMM, Chapter 200 for further details.	In-Place.	1 per source, per project. (see NOTE 1)	55 lb. (25 kg) is approx. 1 full bag by volume.

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CP-L = Colorado Procedures – Laboratory

T & M = AASHTO Procedures

C, D & G = ASTM Procedures

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206 FLOW FILL	<p>Submit to project files a Flow-Fill mix design that documents adherence to the Specifications.</p>
207 TOPSOIL	<p>Contractor Source(s): Acceptance Method: <u>CTR</u>. The Contractor shall provide the Engineer with one copy of Certified Test Reports documenting: pH, % organic, soluble salts, and nutrient and micro-nutrient requirements as specified in the Contract Documents. The tests shall be in accordance with the "Method of Soil Analysis conducted by the Colorado State University Soil Testing Laboratory" or a Certified Soils Laboratory. A list of qualified laboratories is available by contacting the Landscape Architect's office at (303) 757-9174. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p>
208 EROSION CONTROL	<p>Silt Dike: Acceptance Method: <u>COC</u>. Dimensions of silt dike including fabric extensions shall be measured as shown in Subsections 208.02 (i), staples shall be measured for gauge and length as indicated in Subsections 208.02 (i). Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Erosion Log: Acceptance Method: <u>COC</u>. Erosion logs, both Type 1 and Type 2 shall be measured for minimum dimensions and weight as shown in the Revision of 208, Subsection 208.02 (h). Stakes shall be measured to meet nominal dimensions in the Revision of 208, Subsection 208.02 (h). Type 1: Excelsior logs shall be inspected to be fungus free, resin free and free of growth or germination inhibiting substances. Type 2: The compost in (compost) logs shall be inspected in accordance with Subsection 212. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Silt Berm: Acceptance Method: Pre-Approved (with Contractor's COC for Documentation). Silt berms shall be inspected and measured for the dimensions, including percent open area, as shown in Subsection 208.02 (e). Spikes shall be measured to be 10 to 12 inches by 0.375 inch diameter (minimum). Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Erosion Bales: Acceptance Method: <u>COC</u>. Erosion bales shall consist of Certified Weed-Free hay or straw. Each bale shall be identified by blue and orange twine. This twine shall not be removed until the Engineer has inspected and accepted the bales. A Certificate of Compliance is required showing the transit certificate number or a copy of the transit certificate as supplied by the forage producer. Bales shall be measured and weighed to have approximately 5 cubic feet of material and weigh at least 35 pounds. Stakes shall be measured to be 2 inches by 2 inches nominal. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Silt Fence: Acceptance Method: <u>COC</u>. Posts must be measured to be 42 inches (min.) in length and 1.5 inches by 1.5 inches nominal. Posts shall be inspected to confirm that geotextile is attached to posts with 3 or more staples. A Certificate of Compliance is required indicating that geotextile meet the physical requirements shown in Subsection 208.02 (b) and as tested by ASTM D 4632, ASTM D 4491, and ASTM D 4355. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p>

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<p>(Continued from previous page.)</p>	<p>Aggregate Bag: Acceptance Method: <u>COC & CTR</u>. A Certificate of Compliance is required stating that the geotextile meets the property requirements of the Revision of 208, Subsection 208.02 (l) as tested by ASTM D 4632, ASTM D 4533, ASTM D 3786, and ASTM D 4355.</p> <p>Aggregate bags shall be measured and weighed according to the Revision of 208, Subsection 208.02 (l). Rubber in bags shall be inspected to be 95 percent free of metal and other particulates. A Certified Test Report is required verifying that the crushed stone contained in the aggregate bags shall conform to Subsection 703.09, Table 703-7 for Class C. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Concrete Washout Structure: Acceptance Method: <u>Pre-Approved (with Contractor's COC for Documentation)</u>. Pre-fabricated concrete washout, as specified in the plans shall be selected from the CDOT Approved Products List, in accordance with Subsection 208.02 (j). Concrete washout shall be inspected and confirmed that it is an approved product and that it is the correct item as specified in the plans. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Storm Drain Inlet Protection: Acceptance Method: <u>Pre-Approved (with Contractor's COC for Documentation)</u>. Storm drain inlet protection shall be measured for dimensions as required by size and type of inlet, as shown in Subsection 208.02 (m). The device shall be weighed and is required to have an approximate weight of 7 to 10 pounds per linear foot of device. The aggregate contained in the storm drain inlet device shall consist of gravel or crushed stone conforming to Table 703-7 for Class C. A Certificate of Compliance is required stating that the geotextile meets the property requirements of Subsection 208.02 (m) as tested by ASTM D 4632, ASTM D 4533, ASTM D 3786, ASTM D 4491, COE-22125-86 and ASTM D 4355. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Vehicle Tracking Pad: Acceptance Method: <u>COC & CTR</u>. Aggregate shall be a minimum of two fractured faces and that it meets the gradation requirements of 208.02 (k). CTR Geotextile (Erosion Control), when required, shall be Class 2 and conform to the requirements of Subsection 420.02. COC Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p>
<p>209</p> <p>WATERING</p>	<p>Landscaping Water: Acceptance Method: <u>Contractor's COC or CTR</u>. If potable, Document on CDOT Form #157, then retain all copies in the Project Files. When in doubt obtain Certified Test Reports, furnished by the Contractor. Refer to Standard Specifications Subsection 209.02.</p> <p>Dust Palliative (Magnesium Chloride): Acceptance Method: <u>COC</u>. The Contractor shall provide one copy of a Certificate of Compliance. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Embankment Moisture (water) Control: Acceptance Method: <u>N/A</u> Sampling not required unless chemical content and quality are in doubt. Refer to Standard Specifications Subsection 209.02. If water quality test results are required, follow instructions for Landscaping Water above. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p>

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<p style="text-align: center;">212</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">SEEDING, FERTILIZER, SOIL CONDITIONER, AND SODDING</p>	<p>Seed (Native): Acceptance Method: <u>COC</u>. Seed shall be inspected and reviewed according to the Revision of Section 212, Subsection 212.02 (a):</p> <p>All seed shall be furnished in bags or containers clearly labeled to show the name and address of the supplier, the seed name, the lot number, net weight, origin, the percent of weed seed content, the guaranteed percentage of purity and germination, pounds of pure live seed (PLS) of each seed species, and the total pounds of PLS in the container. Seed species shall be compared to seed mix provided in the project plans. If any species have been omitted or substituted without prior approval, seed mix shall not be accepted. The Contractor shall furnish to the Engineer a signed statement certifying that the seed is from a lot that has been tested by a recognized laboratory for seed testing within 13 months prior to the date of seeding. The Engineer may obtain seed samples from the seed equipment, furnished bags or containers to test seed for species identification, purity and germination. Seed tested and found to be less than 10 percent of the labeled certified PLS and different than the specified species will not be accepted. Seed which has become wet, moldy, or damaged in transit or in storage will not be accepted. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Sod: Acceptance Method: <u>Contractor's COC</u>. The Contractor shall submit to the Engineer a sample of sod 6½ ft X 2 ft (2 m X 50 cm) for a comparison standard. Compliance with Standard Specifications Subsection 212.02. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Soil Conditioner: Acceptance Method: <u>COC</u>. Organic fertilizer shall conform to the applicable State fertilizer laws and shall be reviewed to confirm the N-P-K and rates as specified in the plans. Compost shall be weed-free, organic compost derived from a variety of feed stocks including agricultural, biosolids, forestry, food, leaf and yard trimmings, manure, tree wood with no substances toxic to plants.</p> <p>Compost: Acceptance Method: <u>CTR</u>. [Shall have the required physical properties as shown in Subsection 212.02 (b).] A <u>Certified Test Report</u> is required in accordance with Subsection 106.13 confirming that the material has been tested in accordance with the U.S. Composting Council's Test Methods for Examining of Composting and Compost (TMECC) manual. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p>
<p style="text-align: center;">213</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">MULCHING</p>	<p>Material for mulching shall consist of Certified Weed-Free field or marsh hay or straw of oats, barley, wheat, rye or triticale. Each certified weed free mulch bale shall be identified by one of the following: at least one of the ties binding the bale shall consist of blue and orange twine, or the bale shall have a regional Forage Certification Program tag indicating the Regional Forage Certification Program Number. The Contractor shall not unload certified weed free mulch bales or remove their identifying twine, wire or tags until the Engineer has inspected and accepted the bales. The Contractor shall provide a transit certificate that has been filled out and signed by the grower and by the Department of Agriculture inspector.</p> <p>Hay or Straw: Acceptance Method: <u>COC</u>. Straw or hay shall be inspected and any found to be in a stage of decomposition (discolored, brittle, rotten, or moldy) or old, dry mulch which breaks in the crimping process will not be accepted. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Hydraulic Mulching > Wood Cellulose: Acceptance Method: <u>COC</u>. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Mulch Tackifier: Acceptance Method: <u>COC</u>. <u>Bonded Fiber Matrix and Spray on Mulch Blanket require a Certificate of Compliance</u> stating that the product meets the property requirements shown in the Revision of 213 Subsection 213.02. Field inspection is required for all mulching to evaluate installation for uniform cover and correct application rate in</p>

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	accordance with the Revision of 213. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.
214 PLANTING	<p>Plants: <i>Acceptance Method:</i> COC. Plants from out-of-state sources are to conform to the requirements of Standard Specifications Subsection 214.02 or contract documents. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Humus: <i>Acceptance Method:</i> N/A. >> Contact Staff Landscape Architect at CDOT Headquarters (303) 757-9542 for approval of humus material. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Fertilizer: <i>Acceptance Method:</i> COC. Field inspect and document on CDOT Form #157 that material is acceptable, retain all copies in the Project Files. See Standard Specifications Subsection 214.02(d).</p>
215 TRANS-PLANTING	<p>Plants: <i>Acceptance Method:</i> N/A Selected by Engineer from within ROW. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Fertilizer: <i>Acceptance Method:</i> COC. See Standard Specifications Subsection 215.03. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p>
216 SOIL RETENTION COVERING	<p>Soil Retention Covering: <i>Acceptance Method:</i> Pre-Approved (with Contractor's COC for Documentation). Soil Retention Covering shall be either Soil Retention Blankets (SRB) or Turf Reinforcement Mat (TRM) as specified in the plans and <u>shall be selected from the CDOT Approved Products List.</u> Soil retention covering shall be inspected and confirmed that it is an approved product and that it is the correct item as specified in the plans.</p> <p>Staples shall be measured for dimensions as shown in Subsection 216.02 (c).</p> <p>Field inspection is required for all soil retention covering to evaluate installation for application and staple quantity and pattern according to manufacturer's recommendation and M-208-01.</p>
217 HERBICIDE TREATMENT	<p>Herbicide Treatment: <i>Acceptance Method:</i> Pre-Approved (with Contractor's COC for Documentation). Contact Staff Landscape Architect at CDOT Headquarters (303) 757-9542 for approval of material used as Herbicide Treatment until minimum products are posted on the APL. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p>

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			PROJECT VERIFICATION SAMPLING	PROJECT VERIFICATION TESTING			TEST FREQUENCY	SAMPLE SIZE
304 AGGREGATE BASE COURSE	GRADATION	1 per 2,000 tons or 1 per 1,000 cu. yds. or fraction thereof on each Class.	CP 30	CP 31	Report on CDOT Form #6.	Immediately after pugmill mixing or from windrow.	1 per source, per project. (see NOTE 1)	55 lb (25 kg) for Gradation Only.
	ATTERBERG LIMITS	1 per 2,000 tons or 1 per 1,000 cu. yds. or fraction thereof on each Class.		T 89 T 90			1 per source, per project. (see NOTE 1)	110 lb. (50 kg) of minus 3/4" (19.0 mm) is required for full testing (moisture density curve).
	IN-PLACE DENSITY / PERCENT RELATIVE COMPACTION	1 per 2,000 tons or 1 per 1,000 cu. yds. or fraction thereof.		CP 80 / CP 25	Report on CDOT Form #6. CP 25 for 1-point check requirements or as required.	In the compacted lift.		or 55 lbs. (25 kg) in addition to other test samples.
	MOISTURE-DENSITY CURVE	1 per source		CP 23 T 180	Report on CDOT Form #24.		1 per source, per project. (see NOTE 1)	Note: 304 Class 1 is 3 full bags by volume.
	LA ABRASION	1 per source		T 96	LA Abrasion required for Class 4,5,6,7		1 per source, per project. (see NOTE 1)	304 Class 2-7 is 5 full bags by volume.
	R-VALUE	1 per class		CPL 3101			1 R-value test per Class.	
306 RECONDITIONING	IN-PLACE DENSITY / PERCENT RELATIVE COMPACTION	1 per 5,000 sq. yds. or fraction thereof. 1 per 2,500 sq. yds. or fraction thereof for each shoulder (when shoulders only are specified).		CP 80 / CP 25	Report on CDOT Form #212. CP 25 for 1-point check requirements or as required.	In the compacted lift.		
	MOISTURE-DENSITY CURVE	1 per soil type.		CP 23 T 99 T 180	Report on CDOT Form #24.		(see NOTE 1)	

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T & M = AASHTO Procedures

C, D & G = ASTM Procedures

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			PROJECT VERIFICATION SAMPLING	PROJECT VERIFICATION TESTING			TEST FREQUENCY	SAMPLE SIZE
307 LIME TREATED SUBGRADE	IN-PLACE DENSITY / PERCENT RELATIVE COMPACTION	1 per 5,000 sq. yds. or fraction thereof; or as specified in the Contract.		CP 80 / CP 25	Report on CDOT Form #212. CP 25 for 1-point check requirements or as required .	In the compacted lift.	The Region shall retain a Designated Agent Laboratory to perform the required tests, if proper equipment is not available.	Process control test: Schedules for minimum sampling and testing conducted by the Contractor are listed in Standard Specification Section 307, Table 307-1. Cost shall be included in the bid price.
	GRADATION	1 per 5,000 sq. yds. or fraction thereof.	CP 30	CP 31	1" – 100% passing #4 – 60% passing Dry sieving after final mixing.			
	ATTERBERG LIMITS	1 per 5,000 sq. yds. or fraction thereof.		T 89 T 90	Reduce by ½ original PI.			
	MOISTURE-DENSITY CURVE	1 per soil type.		CP 23 T 99 T 180	Moisture content of mixture at the start of compaction shall be at 2 ± 1% above optimum moisture content.			
	UNCONFINED COMPRESSIVE STRENGTH	1 per 5,000 sq. yds. or fraction thereof.		D 5102 (Proc. B)	Tests shall be conducted on samples cured in moist environment for 5 days @ 100 F.			
	THICKNESS ACCEPTANCE	1 per 1,500 sq. yds. or fraction thereof.		C 174	When measurement is <0.5", 2 additional cores shall be taken in that lot and the average of 3 cores will determine the thickness of that lot.			
	SWELL TEST	1 per 5,000 sq. yds. or fraction thereof.		D 4546 (Meth. B)	½% or less with 200 psf. surcharge pressure.	From the compacted roadway.		
	pH	1 per 5,000 sq. yds. or fraction thereof.	CP 30	G 51	pH will be determined after % lime has been established based on unconfined compressive strength pH.			
	SULFATE	1 per soil type.		CPL 2103	Water soluble sulfate content in soil shall be less than 0.2% by dry soil weight.			
	LIME GRADATION	1 per 100 tons of lime or fraction thereof, 1 per source, 1 per project.		CPL 4209	Retain one copy of the CTR along with the Form #157 for Project Files.		No verification gradation samples are to be run in the field except for information only.	

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<p>307</p> <p>HYDRATED LIME for Soil Stabilization</p>	<p>Hydrated Lime: <i>Acceptance Method: Pre-Approved (with Contractor's <u>COC</u> for Documentation)* and <u>CTR</u>.</i> Information available at www.coloradodot.info/business/APL/. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files. The Contractor shall provide the Engineer with one copy of Certified Test Reports that is furnished by the supplier for Chemical Tests, as per ASTM C 977. Immediately attach one copy of the Certified Test Reports and send to the Region Materials Engineer for review and comments. Immediately obtain a 2 lb. sample according to AASHTO T 218 at 1 per source and submit to the Central Laboratory for gradation verification testing.</p> <p>Quicklime: <i>Acceptance Method: <u>CTR</u>.</i> Test results are to document the percent purity. No sample required. (NOTE: number of tons of quicklime x 1.32 = tons of hydrated lime.)</p> <p>* Document the lime source on CDOT Form #157, (include sufficient information on the CDOT Form #157 so that the supplier and source are easily identified).</p>
<p>COMMERCIAL MINERAL FILLERS</p>	<p>For project acceptance, test for gradation according to T 37 for Hydraulic Cement and CPL 4209 for Limestone Dust at 1 per 100 tons or fraction thereof used, and report on CDOT Form #6. Submit a 2 lb. sample to Central Laboratory at a frequency of 1 per 500 tons or fraction thereof, for gradation check sample.</p> <p>Document mineral filler source on CDOT Form #157, (include sufficient information on the CDOT Form #157 so that the supplier and source are easily identified).</p> <p>The above frequency is only applicable when mineral fillers are required by the plans.</p>

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<p style="text-align: center;">308</p> <p style="text-align: center;">PORTLAND CEMENT OR FLY ASH</p>	<p>Portland Cement or Fly Ash utilized for treated base:</p> <p><i>Acceptance Method: Pre-Approved (with Contractor's COC for Documentation).</i> Information available at www.colorado.dot.info/business/APL/. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Established through a Project Special.</p> <p>May be sampled and tested on a project-by-project basis. If the source of cement or fly ash has changed from that in the approved mix design, contact the Concrete Unit of the Central Laboratory at (303) 398-6542.</p> <p>Upon request of the Engineer, the Contractor shall furnish a Bill of Lading, a manufacture's report stating the results of tests made on samples of the material taken during production or transfer, and certifying (with a COC) that the cement conforms to applicable requirements of ASTM C 150, C 1157, or C 595 and fly ash conforms to the applicable requirements of ASTM C 618. Review and Document on CDOT Form #157 in the Project Files.</p>
<p style="text-align: center;">310</p> <p style="text-align: center;">FULL DEPTH RECLAMATION</p>	<p>Full Depth Reclamation:</p> <p>Established through a Project Special. Testing and sampling as specified in the contract.</p> <p>Density is performed at 1 per 4,000 sq. yds per 8 inch lift. Gradation is performed as required.</p>

QA FREQUENCY GUIDE SCHEDULE for Minimum Materials Sampling, Testing, and Inspection

PAY ITEM	TYPE OF TEST	PROJECT VERIFICATION SAMPLING & TESTING FREQUENCY	PROCEDURES		REMARKS	POINT OF VERIFICATION FOR QUALITY DETERMINATION	CENTRAL LAB (CL) [LOCAL AGENCIES ARE TO USE AN ACCREDITED LAB, NOT CDOT CL]	
			PROJECT VERIFICATION SAMPLING	PROJECT VERIFICATION TESTING			TEST FREQUENCY	SAMPLE SIZE
HOT MIX ASPHALT (HMA): VOIDS ACCEPTANCE	ASPHALT CONTENT	1 per 1,000 tons or fraction thereof of mix produced (or as specified in the contract). If less than 5,000 tons see special provisions.	CP 41 CP 55	CP 43 CP 85 CPL 5120	Mix Design as per CP 52; CDOT Form #43 required before mix is produced. Report Asphalt Content on Form #58 and Form #360	Plant discharge, at/or behind paver. For Central Lab Correction Factor, sample aggregate from belt and Binder from Contractors tank.	CHECK TEST: Minimum of each 10k or fraction thereof. 1 sample (can) is submitted to Central Lab & one to the Region Lab. Also needed for Central Lab Correction Factor when new 10K submitted. If Mix Design changes, submit Correction Factor when next 10K is submitted. Submit Correction Factor at beginning of each Paving Season. Note for all tests: 1 full bag of each aggregate type. If LA Abrasion is requested, send 1 additional full bag. Micro Deval cold feed is 1 full bag. 1 full bag is required to get the gradation needed to perform a "D" Method.	65 lb. (30 kg)
	AGGREGATE MOISTURE	Aggregate: 1 per 2,000 tons or fraction thereof of mix produced (or as specified in the contract).	CP 30	CP 33	Report on Form #6 the results from Form #565 or #106. Compare to the % absorption (SSD) on the Form #43.	Aggregate from the cold feed.		25 lb. (Agg) 1 qt (binder)
	GRADATION	Aggregate: 1 per 10,000 tons or fraction thereof of mix produced (or as specified in the contract).	CP 30	CP 31	Report Gradation on CDOT Form #6.	Aggregate from the cold feed, pugmill discharge, extraction, or product of CP-L 5120.		100 lb. (45 kg) (Agg)
	MICRO DEVAL	1 per 10,000 tons as specified in the Contract.	CP 30	CPL 4211	Mix Design as per CP 52.	Aggregate from the cold feed.		65 lb. (30kg)
	FRACTURED FACES AND VOID CONTENT FINE AGGREGATE	As requested by the RME.	CP 30	CP 45 T 304 A	Report on CDOT Form #58.			
	IN-PLACE DENSITY	All lifts of Item 403: 1 per 500 tons (500 t) or fraction thereof of mix placed (or as specified in the contract). Minimum of 10 tests per project. If less than 5,000 tons see special provisions.		CP 44 CP 81 CP 82	Report on CDOT Form #69.	In the compacted lift.		
	THERMAL SEGREGATION	As specified in the contract.		CP 58	Report on CDOT Form #1346.	Behind paver.		
	LONGITUDINAL JOINT DENSITY (Testing Continued on the next page.)	1per 5,000 linear ft. of Joint Minimum of 5 tests per project.		CP 44	Report on CDOT Form #1290. Test template CP 44L in SMM.			

QA FREQUENCY GUIDE SCHEDULE for Minimum Materials Sampling, Testing, and Inspection

PAY ITEM	TYPE OF TEST	PROJECT VERIFICATION SAMPLING & TESTING FREQUENCY	PROCEDURES		REMARKS	POINT OF VERIFICATION FOR QUALITY DETERMINATION	CENTRAL LAB (CL) [LOCAL AGENCIES ARE TO USE AN ACCREDITED LAB, NOT CDOT CL]			
			PROJECT VERIFICATION SAMPLING	PROJECT VERIFICATION TESTING			TEST FREQUENCY	SAMPLE SIZE		
HOT MIX ASPHALT (HMA): VOIDS ACCEPTANCE	403 THEORETICAL MAX. SP. GRAVITY	1 per 1,000 tons. Minimum of 1 test per day if less than 1 000 tons placed in a day.	CP 41 CP 55	CP 51 CP 56	Report on CDOT Form #69.	Plant discharge, at/or behind paver.	CHECK TEST: Minimum of each 10K or fraction thereof for: Hveem Stability, Air Voids, and VMA. Central Lab will run the Lottman test on first 10K or as requested by the Region.	65 lb. (30 kg)		
	HVEEM STABILITY	1 per 10,000 tons.	CP 41 CP 55	CPL 5106	Report on Computer accept. form, or equivalent, or CDOT Form # 360 (see all test items).	Plant discharge, windrow, at/or behind paver.				
	AIR VOIDS	1 per 1,000 tons. Minimum of 5 tests per project. If less than 5,000 tons see special provisions.	CP 41 CP 55	CPL 5115		Plant discharge, windrow, at/or behind paver.				
	VOIDS IN MINERAL AGGREGATE	1 per 1,000 tons. Minimum of 5 tests per project. If less than 5,000 tons see special provisions.	CP 41 CP 55	CP 48		Plant discharge, windrow, at/or behind paver.				
	LOTTMAN	1 per 10,000 tons, or fraction thereof. (See Subsection 401.02)	CP 41 CP 55	CPL 5109 CPL 5115		Plant discharge, windrow, at/or behind paver.				
	HAMBURG WHEEL-TRACKING	1 per project, or mix design change, or as requested by RME. (100 or 125 gyrations)	CP 41	CPL 5112	Submit sample to the EuroLab Unit of the Central Lab. Applicable with Superpave gyratory compaction designs with 100 or 125 design revolutions only.	Plant discharge, windrow, at/or behind paver.			1 st 10K or each mix design change, or as requested by the Region.	65 lb. (30 kg) for the Hamburg test
	FRENCH RUTTING-TESTER	1 per project, or mix design change, or as requested by RME. (100 or 125 gyrations)	CP 41	CPL 5114						65 lb. (30 kg) for the French test.
	ASPHALT MIX PERFORMANCE TEST	1 st 10K, or mix design change only.	CP 41	TBD	Submit sample to the EuroLab. Applicable with Superpave gyratory compaction designs.				1 st 10K or each mix design change only.	130 lb. (60 kg) for the AMPT.
	PAVEMENT SMOOTHNESS (Testing Continued on the next page.)	As specified in contract. Within 14 days after completion of paving.		CP 74	Testing shall be performed by the Contractor and will be witnessed by the Engineer. Data will be transferred to a CD or flash drive and immediately transferred to the Engineer after testing. Data will be immediately transferred to the Central Lab for analysis.				The Central Lab will perform pavement smoothness verification testing. The min. testing will be statewide, once per certified profiler performing work and 25% of profiles submitted for a certified profiler.	

QA FREQUENCY GUIDE SCHEDULE for Minimum Materials Sampling, Testing, and Inspection

PAY ITEM	TYPE OF TEST	PROJECT VERIFICATION SAMPLING & TESTING FREQUENCY	PROCEDURES		REMARKS	POINT OF VERIFICATION FOR QUALITY DETERMINATION	CENTRAL LAB (CL) [LOCAL AGENCIES ARE TO USE AN ACCREDITED LAB, NOT CDOT CL]	
			PROJECT VERIFICATION SAMPLING	PROJECT VERIFICATION TESTING			TEST FREQUENCY	SAMPLE SIZE
403 STONE MATRIX ASPHALT (SMA) & HOT MIX ASPHALT (HMA): GRADATION ACCEPTANCE	ASPHALT CONTENT	1 per 1,000 tons or fraction thereof of mix produced (or as specified in the contract).	CP 41 CP 55	CP 43 CP 85 CPL 5120	Mix Design as per CP 52; CDOT Form #43 required before mix is produced. Report Asphalt Content on Form #58 and Form #360	Plant discharge, at/or behind paver. For Central Lab Correction Factor, sample aggregate from belt and Binder from Contractors tank.	CHECK TEST: Minimum of each 10k or fraction thereof. 1 sample (can) is submitted to Central Lab & one to the Region Lab. Also needed for Central Lab Correction Factor when new 10K submitted. If Mix Design changes, submit Correction Factor when next 10K submitted. Submit Correction Factor at beginning of each Paving Season. Note for all tests: 1 full bag of each aggregate type. If LA Abrasion is requested, send 1 additional full bag. Micro Deval cold feed is 1 full bag. 1 full bag is required to get the gradation needed to perform a "D" Method.	65 lb. (30 kg)
	AGGREGATE MOISTURE	Aggregate: 1 per 2,000 tons or fraction thereof of mix produced (or as specified in the contract).	CP 30	CP 33	Report on Form #6 the results from Form #565 or #106. Compare to the % absorption (SSD) on the Form #43.	Aggregate from the cold feed.		25 lb. (Agg) 1 qt (binder)
	GRADATION	Aggregate: 1 per 2,000 tons or fraction thereof of mix produced (or as specified in the contract).	CP 30	CP 31	Report Gradation on CDOT Form #6.	Aggregate from the cold feed, pugmill discharge, extraction, or product of CP-L 5120.		100 lb. (45 kg) (Agg)
	MICRO DEVAL	1 per 10,000 tons as specified in the Contract.	CP 30	CPL 4211	Mix Design as per CP 52.	Aggregate from the cold feed.		65 lb. (30kg)
	FRACTURED FACES AND VOID CONTENT FINE AGGREGATE	As requested by the RME.	CP 30	CP 45 T 304 A	Report on CDOT Form #58.			
	IN-PLACE DENSITY	All lifts of Item 403: 1 per 500 tons (500 t) or fraction thereof of mix placed (or as specified in the contract). Minimum of 5 tests per project.		CP 44 CP 81 CP 82	Report on CDOT Form #69.	In the compacted lift.		
	THERMAL SEGREGATION	As specified in the contract.		CP 58	Report on CDOT Form #1346.	Behind paver.		
	LONGITUDINAL JOINT DENSITY	1per 5,000 linear ft. of Joint, or fraction thereof.		CP 44	Report on CDOT Form #1290. Test template CP 44L in SMM.			
	(Testing Continued on the next page.)							

QA FREQUENCY GUIDE SCHEDULE for Minimum Materials Sampling, Testing, and Inspection

PAY ITEM	TYPE OF TEST	PROJECT VERIFICATION SAMPLING & TESTING FREQUENCY	PROCEDURES		REMARKS	POINT OF VERIFICATION FOR QUALITY DETERMINATION	CENTRAL LAB (CL) [LOCAL AGENCIES ARE TO USE AN ACCREDITED LAB, NOT CDOT CL]			
			PROJECT VERIFICATION SAMPLING	PROJECT VERIFICATION TESTING			TEST FREQUENCY	SAMPLE SIZE		
403 STONE MATRIX ASPHALT (SMA) & HOT MIX ASPHALT (HMA): GRADATION ACCEPTANCE	THEORETICAL MAX. SP. GRAVITY	1 per 1,000 tons. Minimum of 1 test per day if less than 1,000 tons placed in a day.	CP 41 CP 55	CP 51 CP 56	Report on CDOT Form #69.	Plant discharge, at/or behind paver.	CHECK TEST: Minimum of each 10K or fraction thereof for: Hveem Stability, Air Voids, and VMA. Central Lab will run the Lottman test on first 10K or as requested by the Region.	65 lb. (30 kg)		
	HVEEM STABILITY		CP 41 CP 55	CPL 5106	See Subsection 106.05, Mix Verification Testing, or for SMA see Project Special Provision, Revision of Section 403 Stone Matrix Asphalt Pavement, Subsection 403.03.	Plant discharge, windrow, at/or behind paver.				
	AIR VOIDS		CP 41 CP 55	CP 44 CPL 5115		Plant discharge, windrow, at/or behind paver.				
	VOIDS IN MINERAL AGGREGATE		CP 41 CP 55	CP 48		Plant discharge, windrow, at/or behind paver.				
	LOTTMAN	1 per 10,000 tons, or fraction thereof. (See Subsection 401.02)	CP 41 CP 55	CPL 5109 CPL 5115		Plant discharge, windrow, at/or behind paver.				
	HAMBURG WHEEL-TRACKING	1 per project, or mix design change, or as requested by RME. (100 or 125 gyrations)	CP 41	CPL 5112	Submit sample to the EuroLab Unit of the Central Lab. Applicable with Superpave gyratory compaction designs with 100 or 125 design revolutions only.	Plant discharge, windrow, at/or behind paver.			1 st 10K or each mix design change, or as requested by the Region.	65 lb. (30 kg) for the Hamburg test
	FRENCH RUTTING-TESTER	1 per project, or mix design change, or as requested by RME. (100 or 125 gyrations)	CP 41	CPL 5114						
	ASPHALT MIX PERFORMANCE TEST	1 st 10K, or mix design change only.	CP 41	TBD	Submit sample to the EuroLab. Applicable with Superpave gyratory compaction designs.				1 st 10K or each mix design change only.	130 lb. (60 kg) for the AMPT.
	PAVEMENT SMOOTHNESS	As specified in contract. Within 14 days after completion of paving.		CP 74	Testing shall be performed by the Contractor and will be witnessed by the Engineer. Data will be transferred to a CD or flash drive and immediately transferred to the Engineer after testing. Data will be immediately transferred to the Central Lab for analysis				The Central Lab will perform pavement smoothness verification testing. The minimum testing will be statewide, once per certified profiler performing work and 25% of profiles submitted for a certified profiler.	

QA FREQUENCY GUIDE SCHEDULE for Minimum Materials Sampling, Testing, and Inspection

<p>403</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">All: HOT MIX ASPHALT (HMA) Including STONE MATRIX ASPHALT (SMA)</p>	<p>NOTE: Subsidiary Item: Asphalt cement / performance graded (PG) binders, follow Item 411 of the Schedule.</p> <p>Incidental Items (non-pay):</p> <p>Hydrated Lime: Acceptance Method: <i>Pre-Approved (with Contractor's CTR for Documentation)</i>. The Contractor shall provide the Engineer with one copy of Certified Test Reports that is furnished by the supplier for Chemical Tests, per AASHTO M 303. Immediately attach one copy of the Certified Test Reports and send to the Region Materials Engineer for review and comments. Immediately obtain a 2 lb. sample according to AASHTO T 218 and submit to the Central Laboratory for gradation verification testing. Minimum of one sample per source per project required. Testing must include CP-L 4209. Thereafter; one sample per 100 tons of lime, for gradation only. <i>CPL 4209: 1 per 10,000 tons of HMA mix.</i></p> <p>Mineral Filler – The Contractor shall provide the Engineer with one copy of Certified Test Reports that is furnished by the supplier per AASHTO M 17. One test per 10,000 TONS of SMA Mix, per AASHTO T 37, and T 90 (T 90 is not required when Hydrated Lime or Hydraulic Cement is used for Mineral Filler). CTR is required for SMA including T 88, C 25, and Modified Rigid Voids</p> <p>NOTE: Mix Design as per CP 52, Submit a 50 lbs (25 kg) representative sample of each aggregate for testing of aggregate specific gravity, absorption, and plastic index. If Los Angeles (LA) Abrasion or Micro-Deval is also requested for the large aggregate, submit 60 lbs (27 kg) of the large aggregate. Be sure to document on the CDOT Form #157 which tests are requested.</p> <p>NOTE: QC/QA Computer Test reports are acceptable Documentation for Asphalt Content, Gradation, In-Place Density, Longitudinal Joint Density, Maximum Specific Gravity, Air Voids, and Voids in Mineral Aggregate.</p>
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PAY ITEM	TYPE OF TEST	PROJECT VERIFICATION SAMPLING & TESTING FREQUENCY	PROCEDURES		REMARKS	POINT OF VERIFICATION FOR QUALITY DETERMINATION	CENTRAL LAB (CL) [LOCAL AGENCIES ARE TO USE AN ACCREDITED LAB, NOT CDOT CL]	
			PROJECT VERIFICATION SAMPLING	PROJECT VERIFICATION TESTING			TEST FREQUENCY	SAMPLE SIZE
405 HOT-IN-PLACE RECYCLE	IN-PLACE DENSITY	1 per 5,000 sq. yds. total mix or fraction thereof (or as specified in the contract).		CP 44 CP 81 CP 82	Document on CDOT Form #69. (CP 82 is for Heating & Remixing use ONLY)	Roadway behind paver & after rolling.		
	MAX. SP. GRAVITY (RICE)	Minimum, 1 per each density test.	CP 41	CP 51	Document on CDOT Form #58.			
	ASPHALT Rejuvenating Agent	See Item 411. COC						

CP = Colorado Procedures

CP-L = Colorado Procedures – Laboratory

T & M = AASHTO Procedures

C, D & G = ASTM Procedures

QA FREQUENCY GUIDE SCHEDULE for Minimum Materials Sampling, Testing, and Inspection

PAY ITEM	TYPE OF TEST	PROJECT VERIFICATION SAMPLING & TESTING FREQUENCY	PROCEDURES		REMARKS	POINT OF VERIFICATION FOR QUALITY DETERMINATION	CENTRAL LAB (CL) [LOCAL AGENCIES ARE TO USE AN ACCREDITED LAB, NOT CDOT CL]	
			PROJECT VERIFICATION SAMPLING	PROJECT VERIFICATION TESTING			TEST FREQUENCY	SAMPLE SIZE
406 COLD ASPHALT PAVEMENT (RECYCLE)	IN-PLACE DENSITY	1 per 5,000 sq. yds. or fraction thereof.	CP 41 * (Meth. C)	CP 53 CP 81	Report on CDOT Form #69, Form #6 or computer report. *To obtain material for CP 53.	Windrow or roadway, after rolling in finished roadway. For cationic emulsions, sample after rolling in the finished roadway.		
	GRADATION	1 per 20,000 sq. yds. or fraction thereof.	CP 41	CP 31	Report on CDOT Form #6. Use sieve sizes as required.			
	HVEEM STABILITY	1 per 20,000 sq. yds. or fraction thereof.	CP 41	CPL 5106 modified by CPL 5111	For information only!			
	FREE MOISTURE	1 per day or as specified in the contract.		CP 57				
	ASPHALT Rejuvenating Agent	See Item 411. <u>COC</u>						
	Asphalt Emulsion	See Item 411 <u>COC</u>						
409 SEAL COAT	GRADATION Type I: 3/8" Type II: 1/2" Type IV: 3/4"	1 per 200 tons or 15,000 sq. yds., or fraction thereof.	* CP 30	* CP 31	* NOTE: Report on CDOT Form #6. Submit 66 lb. (30 kg) sample of field-produced aggregate to the Central Lab before use. Performance Graded Binder / Asphalt: Follow instructions in Item 411.	Spreader or the last stockpile prior to placement as specified in the contract.	1 per project. (see NOTE 1)	33 lb. (15 kg) is approx. 1 full bag by volume.
	LA ABRASION	One per source.	CP 30	T 96 or C 535			(see NOTE 1)	
	FRACTURED FACES	1 per 100,000 sq. yds. or fraction thereof.	CP 30	CP 45	Document on CDOT Form # 6.	Spreader or last stockpile prior to the spreader as specified in the contract.	(see NOTE 1)	65 lb. (30 kg)
	COATING TEST	1 per source.	CP 30	CPL 2213		Last stockpile prior to the spreader.		
408 SEALANT JOINT/CRACK	Joint & Crack Sealant, Hot Poured: Acceptance Method: Pre-Approved (per each batch/lot) (with Contractor's COC for Documentation). Information available at www.coloradodot.info/business/APL/ . Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files. Tested for compliance with ASTM D 6690 (Type II or Type IV).							

NOTE 1: This Central Lab test can be performed in the Region Lab or the Field Lab if adequate facilities and equipment are available.

CP = Colorado Procedures

CP-L = Colorado Procedures – Laboratory

T & M = AASHTO Procedures

C, D & G = ASTM Procedures

QA FREQUENCY GUIDE SCHEDULE for Minimum Materials Sampling, Testing, and Inspection

ASPHALT MATERIALS	<p>403 - 411</p> <p>BINDERS & EMULSIONS: <i>Acceptance Method: Pre-Approved (w/ Contractor's COC for Documentation) @ www.coloradodot.info/business/APL/</i></p> <p>NOTE: Normally, samples 1 thru 5 will be designated Lot No. 1, samples 6 thru 10 will be designated Lot No. 2, samples 11 thru 15 will be designated Lot No. 3, etc. At the discretion of the Project Engineer, a lot may be assigned as stated in the "Establishing Lots On The Project" FMM Appendix.</p> <p>ASPHALT CEMENT / PERFORMANCE GRADED (PG) ASPHALT BINDER:</p> <ul style="list-style-type: none"> Project acceptance samples of Asphalt Cement / Performance Graded Binders will be taken at the Contractor's HMA plant. Samples will be 1 qt. (1 liter) in size in a metallic container, and will be sampled in accordance with AASHTO T 40. Procedures and Type of Test: PG Binders will be tested according to the test procedures referenced in AASHTO M 320, as modified by Standard Specifications Subsection 702.01(a), and, as a minimum one sample per lot will be tested for Dynamic Shear Rheometer (DSR) (original). <p>BINDER - When Paid as Item 403: <i>Acceptance Method: Pre-Approved (with Contractor's COC for Documentation).</i> Project Verification Sampling frequency: 1 sample per 1,000 tons of HMA mix, or fraction thereof, or as specified in the project plans. A complete set of tests to show compliance with the required specifications will be performed at the rate of 1 set of tests per 20,000 tons of HMA mix, with a minimum of 1 complete set of tests per project.</p> <p>BINDER --When Paid as Item 411: <i>Acceptance Method: Pre-Approved (with Contractor's COC for Documentation).</i> Project Verification Sampling frequency: 1 sample per 1,000 tons of mix* or fraction thereof, or as specified in the project plans, when bid pay Item is 411 - Asphalt Cement / PG Binder. A complete set of tests to show compliance with the required specifications will be performed at the rate of 1 set of tests per 20,000 tons of mix, with a minimum of 1 complete set of tests per project. For Asphalt cement or binder used in other than HMA Mixes, the sampling rate will be one sample per truck load of Binder. Submit <u>all samples</u> to the Central Laboratory where one sample per lot will be randomly tested. Report all sample information on CDOT Form #411 for PG Binder. *(In SiteManager/LIMS: An estimate of 1 sample per 50 tons of Binder is used based on 5% AC in the mix; 1 sample per 1,000 tons of mix still governs.)</p> <p>EMULSIFIED ASPHALT: <i>Acceptance Method: Pre-Approved (with Contractor's COC for Documentation).</i> Refer to Standard Specifications, Section 702.03. Unless otherwise specified, the Contractor shall provide the Project Engineer with one copy of a Certificate of Compliance that is furnished by the supplier to be attached to the CDOT Form #157. List the information on the form, and note the material is acceptable, then retain in the Project Files.</p> <p>EMULSIFIED ASPHALT (RECYCLING AGENT) FOR COLD ASPHALT PAVEMENT, ITEM 406: <i>Acceptance Method: Pre-Approved (with Contractor's COC for Documentation).</i> One sample per truckload. Acceptance samples may be taken from the line between the truck and recycling equipment or at the truck. Sample according to AASHTO T 40. Sample size: one liter in non-metallic container. Submit on CDOT Form #411. Submit all samples to the Central Lab.</p> <p>EMULSIFIED ASPHALT FOR SEAL COAT, ITEM 409: <i>Acceptance Method: Pre-Approved (with Contractor's COC for Documentation).</i> One sample per truckload. Sample in accordance with AASHTO T 40. Sample size: one liter in non-metallic container. Submit on CDOT Form #411. Submit all samples in the lot to the Central Laboratory. Note: Fog Coat: Will be calculated on percent residue test.</p> <p>ASPHALT EMULSION FOR PRIME COAT (AEP) (any grade): <i>Acceptance Method: COC.</i> The contractor shall provide the Project Engineer with one copy of a Certificate of Compliance that is furnished by the supplier to be attached to the CDOT Form #411. List the information on the form and note that the material is acceptable. Retain in Project Files.</p> <p>ASPHALT REJUVENATING AGENT (ARA): <i>Acceptance Method: Pre-Approved (with Contractor's COC for Documentation).</i> Refer to Section 702.04. Submit one sample per project. Sample size: one liter in non-metallic container. Include supplier / refinery information; type and grade. Submit on CDOT Form #411.</p>	<p>Point of Verification for Quality Determination</p> <p>< HMA Plant.</p> <p>< Storage tank or delivery conveyance.</p> <p>< Storage tank or delivery conveyance.</p> <p>< At Project site.</p> <p>< At Project site.</p> <p>< At Project site.</p> <p>< At Project site.</p> <p>< At Project site.</p>
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QA FREQUENCY GUIDE SCHEDULE for Minimum Materials Sampling, Testing, and Inspection

PAY ITEM	TYPE OF TEST	PROJECT VERIFICATION SAMPLING & TESTING FREQUENCY	PROCEDURES		REMARKS	POINT OF VERIFICATION FOR QUALITY DETERMINATION	CENTRAL LAB (CL) [LOCAL AGENCIES ARE TO USE AN ACCREDITED LAB, NOT CDOT CL]		
			PROJECT VERIFICATION SAMPLING	PROJECT VERIFICATION TESTING			TEST FREQUENCY	SAMPLE SIZE	
PCCP COMPRESSIVE STRENGTH	AIR CONTENT	Minimum 1 per day then 1 per 5,000 sq. yds.	CP 61	T 152	Report test results on CDOT Form #156.	Per CP 61			
	UNIT WEIGHT/YIELD TEMPERATURE	Minimum 3 per mix design.	CP 61	T 121 C 1064					
	SLUMP		CP 61	T 119					
	COMPRESSIVE STRENGTH	See Note 412 on next page.	CP 61	C 39	1 set of 5 cylinders, Test 2 at 7 days and 3 at 28 days, or as specified in the contract. Transmit cylinders on CDOT Form #82. Report on CDOT Form #192. Information cylinders may be cast at the discretion of Proj. Engineer.	Per CP 61			Cylinders are tested in Central Lab, but may be tested in the Field or Region Lab if adequate equipment is available.
	SAND EQUIVALENT		CP 30	CP 37		Stockpile or Plant.			
	WATER CEMENTITIOUS RATIO	1 st three loads each day, then 1 per 2,000 cu. yds. or fraction thereof.			W/C = $\frac{\text{(weight water)}}{\text{(wt. cement + wt. flyash)}}$	Batch ticket.			
PCCP FLEXURAL STRENGTH	AIR CONTENT	Minimum 1 per day then 1 per 5,000 sq. yds.	CP 61	T 152	Report test results on CDOT Form #156.	Per CP 61			
	UNIT WEIGHT/YIELD TEMPERATURE	Minimum 3 per mix design.	CP 61	T 121 C 1064					
	SLUMP	1 per Flexural Strength test.	CP 61	T 119					
	FLEXURAL STRENGTH	1 per 10,000 sq. yds. per mix. Minimum of 3 per process. See Note 412 on next page.	CP 61	T 97	1 set of 4 beams, tested at 28 days. Frequency should be increased to have 1 CDOT test per 4 Contractor QA tests.	Per CP 61			Beams are tested at the Contractor's Quality Control Lab
		WATER CEMENTITIOUS RATIO	1 st three loads each day, then 1 per 2,000 cu. yds. or fraction thereof.			W/C = $\frac{\text{(weight water)}}{\text{(wt. cement + wt. flyash)}}$			Batch ticket.

QA FREQUENCY GUIDE SCHEDULE for Minimum Materials Sampling, Testing, and Inspection

PAY ITEM	TYPE OF TEST	PROJECT VERIFICATION SAMPLING & TESTING FREQUENCY	PROCEDURES		REMARKS	POINT OF VERIFICATION FOR QUALITY DETERMINATION	CENTRAL LAB (CL) [LOCAL AGENCIES ARE TO USE AN ACCREDITED LAB, NOT CDOT CL]	
			PROJECT VERIFICATION SAMPLING	PROJECT VERIFICATION TESTING			TEST FREQUENCY	SAMPLE SIZE
412 PORTLAND CEMENT CONCRETE PAVEMENT COMPRESSIVE STRENGTH OR FLEXURAL STRENGTH	THICKNESS	Min. 1 per day, per mix. If the project total is <50,000 sq. yds. then a minimum of 10 tests. If the project total is ≥50,000 sq. yds. then 1 per 5,000 sq.yds	T 24	T 148	Report thickness on CDOT Form #157. None required on bridge approach slabs.	Hardened concrete.		
	PULL TEST for JOINT SEALANTS	Minimum of 6 transverse and 6 longitudinal joint locations for the first 2,500 linear feet of concrete roadway; 3 transverse and 3 longitudinal joints thereafter on the project.		CP 67	Replace joint failures. Report on CDOT Form #389. Document in Project Files. Witness by Engineer.	Installed in hardened concrete joint.		
	DOWEL BAR & TIE BAR PLACEMENT	As specified in the plans.			Witness Contractor MIT Scanning by Engineer.	Joint.		
	PULL TEST for TIE BARS	As specified in Standard Specification Section 412.13 (a).			If stabbed or drilled into the pavement. Witness by Engineer.	Hardened concrete.		
	TEXTURE DEPTH	1 per 2500 linear feet or fraction thereof in each lane and shoulder wider than 8 feet at 1 per day.		CP 66 CP 77B	Summarize and report tining depth on CDOT Form #157.	Hardened concrete.		
	SAW CUT DEPTH	1 per 528 linear feet, of each longitudinal joint and 1 transverse joint in a section of 528 ft. or fraction thereof.			Summarize and report saw cut depth on CDOT Form #157.	Hardened concrete.		
<p>The specified slump is +/- 2 inches of the Lab design slump. NOTE 412: When compressive or flexural strength specimens are cast the tests for air content, unit weight / yield, temperature, and slump shall be made on the same sample at the same time.</p> <p>Compressive Strength specimens shall be initially cured by full immersion in saturated limewater at 73.4°F ± 3°, with lime concentrations as per AASHTO M 201. Water temperature shall be recorded by a continuous recording thermometer, calibrated every six months; or a maximum-minimum thermometer read and recorded twice a day on CDOT Form #82. When a field trailer is not available the curing tank shall be buried or insulated if necessary.</p> <p>INCIDENTAL ITEMS (non-pay) Joint Sealant with Backer Rod, Silicone: <i>Acceptance Method: Pre-Approved (with Contractor's COC for Documentation).</i> Follow Standard Specification Subsection 412.18. Contraction Joint Plastic Strip: <i>Acceptance Method:</i> Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files. Reinforcing Steel, Dowels Bars, Tie Bars: <i>Acceptance Method:</i> Follow Item 602 of Schedule. COC for Dowels & Tie-bars. Tie-bars are sampled/tested. Buy America Certification. Incidental Items not listed above (non-pay): <i>Acceptance Method:</i> Follow Item 601 of Schedule.</p>								

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420 GEO- SYNTHETICS	<p>Geosynthetics: <i>Acceptance Method: Pre-Approved (with Contractor's <u>COC</u> for Documentation).</i></p> <p>Geomembranes. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files. Reference CDOT Materials Bulletin 2008 No 1.</p>
420 GEO- TEXTILES	<p>Geotextiles: <i>Acceptance Method: Pre-Approved (with Contractor's <u>COC</u> for Documentation).</i></p> <p>The physical, mechanical, and endurance properties that must be met, or exceeded, by the Geotextile being manufactured must be in compliance with AASHTO M 288, Geotextile Specification for Highway Applications. This Specification covers Geotextile fabrics for use in subsurface drainage, separation, stabilization, erosion control, temporary silt fence, and paving fabrics. Reference CDOT Materials Bulletin 2008 No 1.</p> <p>Materials shall be selected from the New York Department of Transportation's Approved Products List of Geosynthetic materials that meet the National Transportation Product Evaluation Program (NTPEP) and AASHTO M 288. <u>The web address to ensure product acceptability is www.dot.state.ny.us/ Go to Site Index, Approved List of Materials and Equipment, Geosynthetics for Highway Construction, Geotextiles.</u></p> <p>Field-inspect and document on CDOT Form #157 that the material is on the New York State APL.</p>
420 GEOGRIDS	<p>Geogrids for Embankment & Roadway: <i>Acceptance Method: <u>COC</u> or <u>CTR</u>.</i></p> <p>Evaluated on a project-by-project basis by the Soils & Geotech Program of the Materials and Geotechnical Branch at (303) 398-6587. After the specific material recommended for use has been evaluated, if approved for use, then field-inspect and document on CDOT Form #157 that the material complies with the project specifications. Certified Test Reports or Certificates of Compliance shall be retained in the Project Files.</p> <p>Geogrids for Mechanically Stabilized Earth (MSE) Walls: <i>Acceptance Method: <u>COC</u> or <u>CTR</u>.</i></p> <p>Evaluated on a project-by-project basis by the Bridge Design and Management Branch at (303) 512-4072. After the specific material recommended for use has been evaluated, if approved for use, then field-inspect and document on CDOT Form #157 that the material complies with the project specifications. Certified Test Reports or Certificates of Compliance shall be retained in the Project Files.</p>
501 STEEL SHEET PILING	<p>Sheet Piling: <i>Acceptance Method: <u>COC. Buy America Certification.</u></i></p> <p>The contractor shall provide the Engineer with one copy of a <u>Certificate of Compliance and Mill Test Reports</u> (furnished by the supplier) showing compliance with Standard Specification Subsection 501.02 (or 501.03 as applicable) and to be retained with CDOT Form #157, then retain in Project Files. State on CDOT Form #157 that: (1) the material has been field-inspected and is acceptable; (2) the Mill Test Reports are on file; and, (3) the heat numbers on piling correspond with the numbers on the Mill Test Reports. Each shipment delivered to the project shall be accompanied by shipping invoices, bar lists and Mill Test Reports.</p> <p>Reinforced Sheet Piling Tips: Documentation is the same as for Sheet Piling. <i>Acceptance Method: <u>COC. Buy America Certification.</u></i></p>
502 PILING	<p>Steel Piling, Steel Pipe Piling, and Steel Shell Piling: <i>Acceptance Method: <u>COC. Buy America Certification.</u></i></p> <p>Follow the instructions in Item 501 of Schedule, except that the material shall comply with Standard Specifications Subsection 502.02.</p> <p>Reinforced Piling Tips: <i>Acceptance Method: <u>COC. Buy America Certification.</u></i></p> <p>Contact the Soils / Rockfall Program of the Materials and Geotechnical Branch at (303) 398-6586.</p>

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503 DRILLED CAISSONS	<p>Concrete: Follow instructions in Item 601 of Schedule.</p> <p>Reinforcing Steel: Follow instructions in Item 602 of Schedule. NOTE: Do not include quantities listed in Item 602 when reporting.</p>
504 CRIBBING	<p>Steel Cribbing: <i>Acceptance Method:</i> <u>CTR. Buy America Certification.</u> The Contractor shall provide the Engineer with one copy of <u>Certified Test Reports / Mill Test Reports (furnished by supplier)</u>, attach and document on CDOT Form #157, then retain in Project Files. State on CDOT Form #157: (1) the material has been field-inspected and is acceptable.</p> <p>Concrete Cribbing: Follow Items 601 and 602.</p> <p>Timber Cribbing: See Item 508.</p>
504 MECHANICALLY STABILIZED EARTH (MSE) WALL	<p>Reinforcement Elements: <i>Acceptance Method:</i> <u>COC. Buy America Certification (if steel is used).</u> Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Facing Elements: <i>Acceptance Method:</i> <u>COC. Buy America Certification.</u> Field-inspect and document on CDOT Form #157 that the material is acceptable, retain all copies in the Project Files.</p> <p>Treated Timbers: See Item 508 and document acceptance of the material as stated.</p> <p>Structure Backfill: See Item 203, 206, 304 or contract documents as appropriate for gradation, atterberg limits, and density testing. Submit a 55 lb. (22 kg) sample to Central Lab for direct shear testing [AASHTO T 236] to verify material's friction angle. Submit the required relative compaction and compaction method if friction angle is required. Submit one sample per source.</p> <p>Foundation Soil: Submit a 55 lb. (22kg) sample to Central Laboratory for direct shear testing [AASHTO T 236] to verify material's friction angle. Submit one sample per 500 feet of wall length if the foundation soil type is unchanged. Submit the required relative compaction and compaction method if friction angle is required. Otherwise, submit one sample for each soil type encountered. If the soil type is the same material as the Structure Backfill, then no additional samples will be required for testing.</p> <p>Misc Items: Document all items in Project Files. Steel used in leveling pad requires a <u>Buy America Certification.</u></p>
506 RIPRAP	<p>Riprap: <i>Field-inspect</i> stone to determine compliance with specifications or contract documents, for size, durability, placement, etc. Determine specific gravity (bulk, saturated-surface dry) where specified in accordance with AASHTO T 85. Document on CDOT Form #157 for each pay item and show quantity represented and that the material has been field inspected and is acceptable. Bed Course Material: Follow instructions in Item 206 of Schedule.</p> <p>Gabions and Slope Mattress: <i>Acceptance Method:</i> <u>COC. Buy America Certification.</u> Wire mesh and fabricated baskets. Note that the baskets and wire mesh material has been field- inspected and is accepted on the CDOT Form #157. See Chapter 500 for further details.</p> <p>Concrete and Concrete Reinforced: Follow instructions in Item 601 and 602 of Schedule.</p>

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507 SLOPE AND DITCH PAVING	<p>Concrete and Concrete Reinforced: Follow instructions in Item 601 and 602 of Schedule. See Chapter 600 for more information. Note: Initial water cure of cylinders as per Item 601.</p> <p>Welded Wire Mesh: <i>Acceptance Method:</i> COC. Buy America Certification. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files. Refer to Standard Specifications Subsection 709.01.</p> <p>Dry Rubble: Determine specific gravity (bulk, saturated-surface dry) where specified according to AASHTO T 85. *</p> <p>Grouted Rubble: Determine specific gravity (bulk, saturated-surface dry) where specified according to AASHTO T 85. *</p> <p>Mortar: <i>Acceptance Method:</i> Pre-Approved (with Contractor's COC for Documentation). Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Asphalt: Field test for asphalt content and gradation; 1 each per 500 tons or fraction thereof. No Central Laboratory samples required except for Lottmans. Report on CDOT Form #6 and #58, or computer printouts are acceptable. Include bitumen quantity in Item 403 (Patching) quantities. Follow Item 411 of Schedule.</p> <p>* Document dry rubble and components of grouted rubble in Project Files.</p>
508 TIMBER STRUCTURES	<p>Treated Timber: <i>Acceptance Method:</i> COC. The Contractor shall provide the Engineer with one copy of the Certificate of Compliance (furnished by the supplier) and a copy of treating report(s) or retention assay. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Timber for Cattle Guards: Follow instructions in Item 611 of Schedule.</p> <p>Untreated Timber: Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p>
509 STEEL STRUCTURES	<p>Steel Structures: <i>Acceptance Method:</i> Pre-Inspected. Buy America Certification. See Special Notice to Contractors for details. Final Inspection Report (CDOT Form #193) will be distributed by the Staff Bridge Fabrication Inspectors after all fabrication is complete and all mill test reports are received from the fabricator. This report will include high strength shop bolts, shop painting and galvanizing. The Staff Bridge Fabrication Inspectors will determine that the structural steel meets all physical and chemical requirements.</p> <p>Field painting: Field inspect for conformance with Standard Specifications Subsections 509.29. Paint reporting procedure is outlined in Item 708 of Schedule.</p> <p>Isolated small quantities of structural steel and structural steel-galvanized should be field-inspected and reported on CDOT Form #157, and state that the material is acceptable.</p> <p>Structural Steel - Galvanized: The requirements are the same as for non-galvanized steel. Buy America Certification.</p>
510 STRUCTURAL PLATE STRUCTURES	<p>Structural Plate Structures: <i>Acceptance Method:</i> CTR. Buy America Certification.</p> <p>The contractor shall provide the Engineer with one copy of Certified Test Reports (furnished by supplier) attached to the CDOT Form #157, then retain in Project Files. State on CDOT Form #157 (1) the material has been field inspected and is acceptable, (2) identification numbers on mill test reports corresponds with heat numbers on plates. State on the CDOT Form #157 that the high strength bolts were field inspected and bear high strength bolt markings.</p>

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<p style="text-align: center;">512 BEARING DEVICE</p>	<p>Type I & II: <i>Acceptance Method: COC. Buy America Certification.</i> Contractor shall provide one copy of Certificate of Compliance and including Certified Test Reports on components. Copies of this Certificate of Compliance are to be attached to the CDOT Form #157, then retain in Project Files. State on CDOT Form #157: (1) the material has been field-inspected and is acceptable.</p> <p>Type III: <i>Acceptance Method: CTR. Buy America Certification.</i> The contract will list the products and manufacturers specifically approved by the Bridge Design and Management Branch. Field- inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p>
<p style="text-align: center;">514 PED. & BIKEWAY RAILING</p>	<p>Pedestrian & Bikeway Railing: Steel, Aluminum, Timber (any type). <i>Acceptance Method: CTR. Buy America Certification.</i></p> <p>The contractor shall provide the Engineer with one copy of Certified Test Reports (furnished by supplier) to be filed in the Project Files with the CDOT Form #157. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p>
<p style="text-align: center;">515 WATERPROOFING MEMBRANE</p>	<p>Prefabricated, Reinforced Membrane: <i>Acceptance Method: COC.</i> Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Single Component, Hot Applied, Elastomeric Membrane: <i>Acceptance Method: Pre-Approved (per each batch/lot) (with Contractor's COC for Documentation)</i> Information available at www.coloradodot.info/business/APL/. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Protective Covering (Roofing paper): <i>Acceptance Method: COC.</i> Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Concrete Sealer: <i>Acceptance Method: Pre-Approved (with Contractor's COC for Documentation).</i></p> <p>Information available at www.coloradodot.info/business/APL/. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p>

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<p style="text-align: center;">516</p> <p style="text-align: center;">DAMP- PROOFING</p>	<p>Asphalts: <i>Acceptance Method:</i> <u>COC</u>.</p> <p>Materials for damp-proofing with asphalt shall conform to the requirements ASTM D 449. The contractor shall provide the Engineer with one copy of Certificate of Compliance (furnished by supplier). Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p>
<p style="text-align: center;">517</p> <p style="text-align: center;">WATER- PROOFING</p>	<p>Waterproofing Materials: <i>Acceptance Method:</i> <u>COC</u>.</p> <p>Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p>
<p style="text-align: center;">518</p> <p style="text-align: center;">WATERSTOPS & EXPANSION JOINTS (DEVICES)</p>	<p>Asphaltic Plug Joints: <i>Acceptance Method:</i> Pre-Approved (per each batch/lot) (with Contractor's <u>COC</u> for Documentation). Information available at www.coloradodot.info/business/APL/. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files. If verification testing is requested by the Engineer, submit one box of specimen with a CDOT Form #157 to the Central Lab.</p> <p>Waterstops: <i>Acceptance Method:</i> <u>COC</u>. Complies with the Standard Specifications Subsection 518.02. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Asphaltic Expansion Devices: <i>Acceptance Method:</i> <u>COC</u>. Complies with the Standard Specifications Subsection 518.03. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Elastomeric Expansion Devices: <i>Acceptance Method:</i> <u>COC</u>. Complies with the Standard Specifications Subsection 518.04. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Modular Expansion Devices: <i>Acceptance Method:</i> <u>COC</u>. Complies with the Standard Specifications Subsection 518.05. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Elastomeric Concrete End Dam: <i>Acceptance Method:</i> <u>COC</u>. Complies with the Standard Specifications Subsection 518.06. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p>

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PAY ITEM	TYPE OF TEST	PROJECT VERIFICATION SAMPLING & TESTING FREQUENCY	PROCEDURES		REMARKS	POINT OF VERIFICATION FOR QUALITY DETERMINATION	CENTRAL LAB (CL) [LOCAL AGENCIES ARE TO USE AN ACCREDITED LAB, NOT CDOT CL]	
			PROJECT VERIFICATION SAMPLING	PROJECT VERIFICATION TESTING			TEST FREQUENCY	SAMPLE SIZE
601	AIR CONTENT (#1) UNIT WEIGHT (#1) TEMPERATURE	The 1 st three batches at the beginning of a day's production, then one random test per five batches.	CP 61	T 152 T 121 C 1064	Report test results on CDOT Form #156, and CDOT Form #82 when batch correlates to cylinders cast.	Per CP 61.		
	SLUMP (#1)	1 per set of cylinders.	CP 61	T 119		Per CP 61.		
	COMPRESSIVE STRENGTH	One set of cylinders per 100 cu. yds. or fraction thereof. Test 2 at 7 days and 3 at 28 days. For Class H and HT concrete, one set of cylinders per 100 cu. yds. or fraction thereof. Test 2 at 7 days, 3 at 28 days, and 3 at 56 days.	CP 61	C 39 T 23 (#2)	Submit cylinders on CDOT Form #82. Report on CDOT Form #192. Information cylinders may be cast at the discretion of Project Engineer and cured at the structure.		Cylinders are tested in the Central Lab, but may be tested in the Field or Region Laboratory if adequate equipment is available.	
STRUCTURAL CONCRETE	<p>1. NOTE (#1): Slump, Air Content, and Unit Wt. tests are required for each set of cylinders for all Classes of concrete. Except for Class BZ concrete the specified slump is +/- 2 inches of the Lab mix design slump.</p> <p>2. NOTE (#2): Specimens shall be initially cured by full immersion in saturated limewater, with lime concentrations as per AASHTO M 201. Water temperature shall be recorded by a continuous recording thermometer, calibrated every six months; or a maximum-minimum thermometer read and recorded, twice a day, on the CDOT Form #82. When a field trailer is not available the curing tank shall be buried or insulated if necessary.</p> <p>INCIDENTAL ITEMS (non-pay)</p> <p>Reinforcing Steel: Follow instructions in Item 602 of the Schedule.</p> <p>Water, Non-Potable: <i>Acceptance Method: <u>CTR</u>.</i> Obtain <u>Certified Test Reports from the Contractor (furnished by the supplier)</u> before using. The test shall be in accordance with ASTM C 1602. Document on the CDOT Form #157, and retain in Project Files.</p> <p>Water, Potable: <i>Acceptance Method: <u>COC</u>.</i> Document on the CDOT Form #157, and retain in Project Files.</p> <p>Air Entraining Agents and Chemical Admixtures: <i>Acceptance Method: <u>Pre-Approved (with Contractor's COC for Documentation)</u>.</i> The Contractor may change the brand of admixture as approved by the Engineer (see Subsection 601.05). Amounts of admixture needed to achieve the desired physical properties, may be adjusted once the quantities have been established in the trial mix. <u>Information available at www.coloradodot.info/business/APL/. Only approved products may be used.</u> Report all additives and dosages on batch ticket (CDOT Form #281 or equivalent). Plant computer printout batch ticket is acceptable.</p> <p>(Continued on next page.)</p>							

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<p style="text-align: center;">601</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">STRUCTURAL CONCRETE</p>	<p>INCIDENTAL ITEMS (non-pay)</p> <p>Other Additives: Contact Central Laboratory at (303) 398- 6542 for sampling, testing, and documentation information before use.</p> <p>Curing Compounds: <i>Acceptance Method: Pre-Approved (with Contractor's COC for Documentation).</i> <u>Information available at www.coloradodot.info/business/APL/.</u> Tabulate the quantity of material used on the project. If you have questions or problems, call (303) 398-6542.</p> <p>Epoxy Adhesive: <i>Acceptance Method: Pre-Approved (with Contractor's COC for Documentation).</i> <u>Information available at www.coloradodot.info/business/APL/.</u> For bonding fresh concrete to old concrete.</p> <p>Expansion Joint Material, Preformed Filler: <i>Acceptance Method: Pre-Approved (with Contractor's COC for Documentation).</i> <u>Information available at www.coloradodot.info/business/APL/.</u> Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Cementitious Grouts: <i>Acceptance Method: Pre-Approved (Contractor's COC for Documentation).</i> <u>Information available at www.coloradodot.info/business/APL/.</u></p> <p>Class 5 Masonry Finish: <i>Acceptance Method: Pre-Approved (Contractor's COC for Documentation).</i> <u>Information available at www.coloradodot.info/business/APL/.</u></p> <p>Structural Concrete Coating (Acrylic): <i>Acceptance Method: Pre-Approved (with Contractor's COC for Documentation).</i> <u>Information available at www.coloradodot.info/business/APL/.</u> Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Bridge Deck Forms; Permanent (left in-place) Steel: <i>Acceptance Method: CTR. Buy America Certification.</i> The contractor shall provide the Engineer with one copy of Certified Test Reports that are furnished by supplier to be filed with CDOT Form #157. State on CDOT Form #157: (1) the material has been field-inspected and is acceptable, (2) Certified Test Reports are on file.</p>
<p style="text-align: center;">602</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">REINFORCING STEEL</p>	<p>Reinforcing Steel (black bar) & Epoxy Coated Reinforcing Steel (green bar): <i>Acceptance Method: COC. Buy America Certification.</i> <u>In accordance with CP 11 the Contractor shall only use qualified manufacturer sources of reinforcing steel found on the QML at www.coloradodot.info/business/APL/.</u></p> <p>Each shipment delivered to the project shall be accompanied by shipping invoices, bar lists and Mill Test Reports. These reports are to be retained in the Project Files during construction. Document on a CDOT Form #157: (1) that the steel mill is on the QML (2) the material has been field-inspected and is acceptable, (3) Mill Test Reports are on file, and (4) a tabulation of the quantity used on project. Verify that the bar markings match the source listed on the Mill Test Report. A bar marking identification guide reference is in Chapter 600.</p> <p>One sample of reinforcing steel shall be submitted to the Central Lab from each approved source. The sample shall consist of three straight 3-4 foot long pieces of the same grade and size. The bar size will be a size #10 or smaller.</p> <p>Epoxy Coating: <i>Acceptance Method: Pre-Approved (with Contractor's COC for Documentation).</i> <u>Information available at www.coloradodot.info/business/APL/.</u></p> <p>Steel Chairs: <i>Acceptance Method: COC. Buy America Certification.</i> Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p>

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<p>603</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">CULVERTS AND SEWERS</p>	<p>Corrugated Steel Pipe (CSP) and End Sections. Corrugated Aluminum Pipe (see note). Bonded CSP. Bituminous Coated CSP and Precoated CSP: <i>Acceptance Method: COC. Buy America Certification.</i> Field inspect for visible defects. Tabulate final quantities. Total quantities must equal or exceed final project quantities. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files. Note: Ensure that the heat numbers in the COC correspond with the heat numbers on the field inspected pipe.</p> <p>Cast-in-Place Concrete Pipe: Follow instructions in Item 601 of Schedule. NOTE: T 23, Initial water cure as per Item 601, or as directed by the Engineer.</p> <p>Concrete Pipe and Precast Concrete Box Culvert: <i>Acceptance Method: COC. Buy America Certification.</i> <u><i>In accordance with CP 11 the Contractor shall only use qualified manufacturer sources of precast concrete products found on the web site at www.coloradodot.info/business/APL/.</i></u> Field-inspect for visible defects. Tabulate final quantities on CDOT Form #157. Total quantities must equal or exceed final project quantities. Field-inspect and document on CDOT Form #157 that the material is acceptable, retain all copies in the Project Files.</p> <p>Thermoplastic Pipe: <i>Acceptance Method: COC.</i> Pipe types can include PVC, (PE) Polyethylene. <u>Must have Steel End Section or as approved by the Engineer.</u> Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>HDPE Pipe & Polypropylene Pipe: <i>Acceptance Method: COC.</i> (Note: Manufacturing facility must have COC from NTPEP, see Special Notice to Contractors.)</p> <p>Vitrified Clay Pipe: <i>Acceptance Method: COC.</i> Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Gaskets: <i>Acceptance Method: COC.</i> Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Pipe Joint-Sealing Compounds: <i>Acceptance Method: COC.</i> Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>NOTE: See the M Standards for proper types of End Sections when using Aluminum pipe.</p>
<p>604</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">MANHOLES, INLETS, AND METER VAULTS</p>	<p>Manholes, Inlets, and Precast Concrete Units (Prefabricated): <i>Acceptance Method: COC. Buy America Certification.</i> <u><i>In accordance with CP 11 the Contractor shall only use qualified manufacturer sources of precast concrete products found on the web site at www.coloradodot.info/business/APL/.</i></u></p> <p>Field Fabricated: <u>Concrete</u>, follow Item 601. Note: Initial water cure as per Item 601, or as directed by the Engineer. <u>Reinforcing Steel</u>, follow Item 602. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Clay or Shale Brick, Concrete Brick, Concrete Masonry Blocks: <i>Acceptance Method: COC.</i> Must meet individual specifications though not paid for separately. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Inlet Grates and Frames, Manhole Rings, Covers, and Steps: <i>Acceptance Method: COC. Buy America Certification.</i> Must meet individual specifications though not paid for separately. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p>

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<p>605</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">SUBSURFACE DRAINS</p>	<p>Corrugated Metal Pipe: <i>Acceptance Method: <u>COC. Buy America Certification.</u></i> Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Vitrified Clay Pipe: <i>Acceptance Method: <u>COC.</u></i> Follow instructions in Item 603.</p> <p>Plastic Pipe: <i>Acceptance Method: <u>COC.</u></i> Field-inspect and document on CDOT Form #157 that the material is acceptable, retain all copies in the Project Files.</p> <p>Bedding and Filter Materials: Follow instructions in Item 206 of Schedule. See Chapter 200 for filter material information.</p>
<p>606</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">GUARDRAIL (& BRIDGE) RAIL</p>	<p>Type 3: Treated Timber Posts and Blocks. <i>Acceptance Method: <u>COC.</u></i> The Contractor shall provide one copy of a <u>Certificate of Compliance (furnished by the supplier).</u> <u>POSTS MUST BE FIELD INSPECTED</u> (size, straightness, overall quality, visible defects, etc). Document on CDOT Form #157. List source, quantity, and sizes.</p> <p>Guardrail Block, Synthetic. <i>Acceptance Method: <u>Pre-Approved (Contractor's COC for Documentation).</u></i> <u>Information available at www.coloradodot.info/business/APL/.</u></p> <p>Steel Posts for Type 3 (All types) - Document same as Guardrail below.</p> <p>Hardware and End Anchors - <i>Acceptance Method: <u>COC. Buy America Certification.</u></i> List each pay item type on CDOT Form # 157. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Rail (Guardrail) - <i>Acceptance Method: <u>COC. Buy America Certification.</u></i> Contractor shall provide the Engineer with one copy of a <u>Certificate of Compliance</u> and Mill Test Reports (<i>furnished by supplier</i>) to be filed with CDOT Form #157. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files. Note: Ensure that the heat numbers in the COC correspond with the heat numbers on the field inspected guardrail.</p> <p>Type 7, Precast: <i>Acceptance Method: <u>COC. Buy America Certification.</u></i> <u>In accordance with CP 11 the Contractor shall only use qualified manufacturer sources of precast concrete products found on the web site at www.coloradodot.info/business/APL/.</u> The Contractor shall provide a copy of a <u>Certificate of Compliance (furnished by the supplier)</u>, document on CDOT Form #157.</p> <p>Type 7, Cast-in-Place: Follow Item 601 of Schedule, except that the test frequency for compressive strength shall be 1 per 1,000 linear feet. NOTE: Initial water cure as per Item 601, or as directed by the Engineer.</p> <p>Reinforcing Steel - One sample of reinforcing steel shall be submitted to the Central Lab from each approved source. The sample shall consist of three straight 3-4 foot long pieces of the same grade and size. The bar size will be a size #10 or smaller.</p> <p>Incidental Items (non-pay) - Follow instructions in Section 601 of this Schedule.</p> <p>Light Weight Aggregates - Follow Section 601 of this Schedule, except that Central Laboratory sample size shall be one full sack.</p> <p>Glare Screens: <i>Acceptance Method: <u>Pre-Approved (Contractor's COC for Documentation).</u></i> <u>Information available at www.coloradodot.info/business/APL/.</u></p> <p>Type 10M, Type H and Type R: <i>Acceptance Method: <u>CTR. Buy America Certification.</u></i> The Contractor shall furnish the Engineer with one copy of <u>Certified Test Reports (furnished by the supplier)</u> including <i>Mill Test Reports</i> to be filed with CDOT Form #157. Field-inspect and document on CDOT Form #157 that the material is acceptable, retain all copies in the Project Files.</p>

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<p>607</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">FENCES</p>	<p>Barbed Wire: <i>Acceptance Method: <u>COC. Buy America Certification.</u></i> Each roll shall be tagged with legible markings bearing the following information. ASTM Designation A 121, Design No., Class of Coating, Length of Roll and Name of Manufacturer. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Woven Wire: <i>Acceptance Method: <u>COC. Buy America Certification.</u></i> Each roll shall be tagged with legible markings bearing the following information. ASTM Designation A 116, Design No., Class of Coating. Length of Roll, and Name of Manufacturer and document this information on CDOT Form #157.</p> <p>Gates, Wire Ties, Wire Stays, Clips, Clamps, Staples, and Miscellaneous Fittings: Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Chain Link Fabric: <i>Acceptance Method: <u>COC. Buy America Certification.</u></i> Field-inspect and document on CDOT Form # 157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Steel Posts, Steel Pipe Railing: <i>Acceptance Method: <u>COC. Buy America Certification.</u></i> Make random check of weight, length, and coating. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Timber Posts (Treated): <i>Acceptance Method: <u>COC.</u></i> POSTS MUST BE FIELD-INSPECTED (size, straightness, etc.). Document on CDOT Form #157 listing source, number, and sizes.</p> <p>Timber Posts (Untreated): <i>Acceptance Method: <u>COC.</u></i> Field-inspect and document on CDOT Form #157 listing the source, number, and sizes.</p> <p>Sound Barrier Wall: <i>Acceptance Method: <u>Pre-Approved (with Contractor's COC for Documentation).</u></i> <u>Information available at www.coloradodot.info/business/APL/.</u> Reflective Sound Barrier Walls and Absorptive Sound Barrier Walls are placed on the APL solely based on the acoustic qualities. The Contractor shall provide the Engineer with one copy of <i>Certified Test Reports (furnished by the supplier)</i> to validate the structural values required of the wall. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p>
<p>608</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">CURB RAMP</p>	<p>Truncated Dome / Detectable Warning Plate: <i>Acceptance Method: <u>Pre-Approved (with Contractor's COC for Documentation).</u> <u>Buy America Certification</u></i> (if cast iron or steel).</p> <p><u>Information available at www.coloradodot.info/business/APL/.</u> Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files. Reference M-608-1.</p>

QA FREQUENCY GUIDE SCHEDULE for Minimum Materials Sampling, Testing, and Inspection

PAY ITEM	TYPE OF TEST	PROJECT VERIFICATION SAMPLING & TESTING FREQUENCY	PROCEDURES		REMARKS	POINT OF VERIFICATION FOR QUALITY DETERMINATION	CENTRAL LAB (CL) [LOCAL AGENCIES ARE TO USE AN ACCREDITED LAB, NOT CDOT CL]	
			PROJECT VERIFICATION SAMPLING	PROJECT VERIFICATION TESTING			TEST FREQUENCY	SAMPLE SIZE
608 SIDEWALKS AND BIKEWAYS (PCCP)	AIR CONTENT	1 per 1,000 sq. yd. (840 m ²) or fraction thereof.	CP 61	T 152	Report on CDOT Form #156.	Per CP 61.		
	UNIT WEIGHT/YIELD TEMPERATURE	One per set of cylinders.	CP 61	T 121 C 1064				
	SLUMP	One per set of cylinders.	CP 61	T 119				
	COMPRESSIVE STRENGTH	1 set of 5 cylinders per 1,000 sq. yds. (840 m ²) or fraction thereof. Test 2 at 7 days and 3 at 28 days.	CP 61	C 39	Submit cylinders on CDOT Form # 82. Report on CDOT Form #192. Information cylinders may be cast at the discretion of the Project Engineer. Initial water cure as per Item 601, or as directed by the Engineer.	Per CP 61.		
<p>NOTE: At the start of each day's production, the first load of concrete will be tested for air content. If the test meets specifications, then revert to the testing frequency above. Slump and air content tests are required for each set of cylinders for all Classes of concrete. The specified slump is +/- 2 inches of the Lab mix design slump.</p> <p>Incidental Items (non-pay): Follow instructions in Item 601 of Schedule.</p>								
SIDEWALKS AND BIKEWAYS (HMA)	ASPHALT CONTENT	1 per project if plan quantity is more than 2,500 tons.	CP 41 CP 55	CP 85 CPL 5120	Mix Design as per CP 52; CDOT Form #43 required <u>before</u> mix is produced. Report Asphalt Content on Form #58.	See Item 403	See Item 403	See Item 403
	GRADATION	1 per project if plan quantity is more than 2,500 tons.	CP 30	CP 31	Report Gradation on CDOT Form #6	See Item 403		
	IN-PLACE DENSITY	1 per project if plan quantity is more than 2,500 tons		CP 44 CP 81	Report on CDOT Form #69	See Item 403		

QA FREQUENCY GUIDE SCHEDULE for Minimum Materials Sampling, Testing, and Inspection

PAY ITEM	TYPE OF TEST	PROJECT VERIFICATION SAMPLING & TESTING FREQUENCY	PROCEDURES		REMARKS	POINT OF VERIFICATION FOR QUALITY DETERMINATION	CENTRAL LAB (CL) [LOCAL AGENCIES ARE TO USE AN ACCREDITED LAB, NOT CDOT CL]	
			PROJECT VERIFICATION SAMPLING	PROJECT VERIFICATION TESTING			TEST FREQUENCY	SAMPLE SIZE
609 CURB AND GUTTER (PCCP)	AIR CONTENT	1 per 2,000 lin. ft. (600 m) or fraction thereof.	CP 61	T 152	Report on CDOT Form #156.	Per CP 61.		
	UNIT WEIGHT/YIELD TEMPERATURE	One per set of cylinders.	CP 61	T 121 C 1064				
	SLUMP	One per set of cylinders.	CP 61	T 119				
	COMPRESSIVE STRENGTH	1 set of 5 Cylinders per 2,000 lin. ft. (600 m) or fraction thereof. Test 2 at 7 days and 3 at 28 days.	CP 61	C 39	Submit cylinders on CDOT Form #82. Report on CDOT Form #192. Information cylinders may be cast at the discretion of the Project Engineer. Initial water cure as per Item 601, or as directed by the Engineer.	Per CP 61.		
<p>NOTE: At the start of each day's production, the first load of concrete will be tested for air content. If the test meets specifications, then revert to the testing frequency above. Slump and air content tests are required for each set of cylinders for all Classes of concrete. The specified slump is +/- 2 inches of the Lab mix design slump.</p> <p>Incidental Items (non-pay): Follow instructions in Item 601 of Schedule.</p>								
CURB AND GUTTER (HMA)	ASPHALT CONTENT	1 per 2,500 lin. ft. (40 tons) or fraction thereof.	CP 41 CP 55	CP 85 CPL 5120	Mix Design as per CP 52; CDOT Form #43 required <u>before</u> mix is produced. Report Asphalt Content on Form #58.	Plant discharge, at/or behind paver. For Central Lab Correction Factor, sample aggregate from belt and Binder from Contractors tank.	See Item 403	See Item 403
	GRADATION	1 per 2,500 lin. ft. (40 tons) or fraction thereof.	CP 30	CP 31	Report Gradation on CDOT Form #6	Aggregate from the cold feed, pugmill discharge, extraction, or product of CP-L 5120.		

QA FREQUENCY GUIDE SCHEDULE for Minimum Materials Sampling, Testing, and Inspection

610 MEDIAN COVER MATERIAL	<p>Asphalt: Conforms to Item 403 (SEE Section 610.02)</p> <p>Decorative Concrete and Patterned Concrete: Follow instructions in Item 608 of this Schedule.</p> <p>Median Edging (Patterned Concrete): Follow instructions in Item 609 of Schedule. NOTE: Submit a Median Cover Material mix design documenting adherence to Special Provisions or contract documents. NOTE: Initial water cure as per Item 601, or as directed by the Engineer.</p> <p>Aggregate: Sample according to CP 30 and test for gradation according to CP 31. Test frequency 1 per 1,000 tons or fraction thereof. Report on CDOT Form #6. Points of Acceptance: In stockpile or placed layer.</p> <p>Stone: Paid by ton (metric ton). Field inspect for compliance with Special Provisions or contract documents. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Herbicide Treatment: Follow instructions in Item 217 of this Schedule. Use under the aggregate or under the stone.</p>
611 CATTLE GUARDS	<p>Precast Cattle Guard Boxes: <i>Acceptance Method: COC. Buy America Certification.</i> <u>In accordance with CP 11 the Contractor shall only use qualified manufacturer sources of precast concrete products found on the web site at www.coloradodot.info/business/APL/.</u> The Contractor shall provide a copy of a <u>Certificate of Compliance (furnished by the supplier)</u>, document on CDOT Form #157.</p> <p>Concrete, Reinforcing Steel, Structural Steel and Treated Timber: Follow instructions for 601 and 602 of this Schedule. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p>
612 DELINEATORS & REFLECTORS	<p>Delineators: Steel Posts: <i>Acceptance Method: COC. Buy America Certification.</i> <u>Make random check of weight, length, and condition of coating.</u> Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Reflectors : <i>Acceptance Method: Pre-Approved (with Contractor's COC for Documentation).</i> Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files. <u>Information available at www.coloradodot.info/business/APL/.</u></p> <p>Delineators: Flexible Posts - <i>Acceptance Method: Pre-Approved (with Contractor's COC for Documentation).</i> Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files. <u>Information available at www.coloradodot.info/business/APL/.</u></p> <p>Median Barrier Reflectors: <i>Acceptance Method: Pre-Approved (with Contractor's COC for Documentation).</i> Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files. <u>Information available at www.coloradodot.info/business/APL/.</u></p>

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613	<p>Luminaire: <i>Acceptance Method:</i> <u>COC. Buy America Certification.</u> The contractor shall provide the Engineer with one copy of a <u>Certificate of Compliance (furnished by supplier)</u> to be filed with CDOT Form #157. Field-inspect and document on CDOT Form #157 that the material is acceptable, retain all copies in the Project Files.</p> <p>Wiring: <i>Acceptance Method:</i> <u>COC.</u> Field-inspect for compliance with plans and specifications. Document in Project Files.</p> <p>Anchor Bolts: <i>Acceptance Method:</i> <u>CTR.</u> The Contractor shall provide the Engineer with one copy of <u>Certified Test Reports (furnished by supplier)</u> to be filed with CDOT Form #157. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Metal or Plastic Conduit: <i>Acceptance Method:</i> <u>COC. Buy America Certification.</u> Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>* Light Standards, High Mast: <i>Acceptance Method:</i> <u>COC. Buy America Certification.</u> Includes poles, luminaries, rings, lowering devices, electrical components. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Break away couplers and bases: Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Light Standards, Precast Concrete: <i>Acceptance Method:</i> <u>COC. Buy America Certification.</u> Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>* Light Standards, Metal (poles and arms): <i>Acceptance Method:</i> <u>COC. Buy America Certification.</u> Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Hardware for Metal Light Standards: Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>* Note: <i>When light standards (poles and arms) are paid for under Item 613, a <u>Certificate of Compliance for all structural components including light standards, bases, couplers, anchor bolts, luminaries, and other attachments shall state that the components will safely resist the higher of a 100 miles per hour wind velocity</u> (Section 715.03 (a)) or the wind velocity specified in the plans or specifications or contract documents. The Certificate of Compliance shall state that static tests have been performed. If the Certified Test Reports are not in the Project File with CDOT, it must be attached to the Certificate of Compliance. The test procedure for aluminum parts shall satisfy the requirements of the Aluminum Association, Inc., "Specifications for Aluminum Structures" Section 8, except that no reduction factors for live load and dead load will be permitted. The <u>Certificate of Compliance for breakaway couplers and bases shall state that production lot samples have been tested and meet the breakaway requirements of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals, Section 7.</u></i></p> <p>NOTE: For any concrete cast-in-place, if cylinders are fabricated, then initial water cure as per Item 601, or as directed by the Engineer.</p>
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LIGHTING

QA FREQUENCY GUIDE SCHEDULE for Minimum Materials Sampling, Testing, and Inspection

<p>614</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">TRAFFIC CONTROL DEVICES</p>	<p>Sign Panels: <i>Acceptance Method:</i> COC. Buy America Certification. The Contractor shall provide the Engineer with one copy of a Certificate of Compliance (furnished by supplier) to be filed with CDOT Form #157. After arrival on the project, field-inspect fabricated panels for correct sign wording, legend and workmanship. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Retroreflective Sign Sheeting: <i>Acceptance Method:</i> Pre-Approved (Contractor's COC for Documentation). Information available at www.coloradodot.info/business/APL/.</p> <p>Sign Posts - Steel, Wide Flange (WF): <i>Acceptance Method:</i> COC. Buy America Certification. The contractor shall provide the Engineer with one copy of a Certificate of Compliance (furnished by supplier) to be filed with CDOT Form #157. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>U2 Type: <i>Acceptance Method:</i> COC. Buy America Certification. Make random check of weight, coating, and length for plan requirements. Square Tube Posts may be used as alternate. See Standard Drawing for post sizes. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Timber: Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Overhead Sign Structures: <i>Acceptance Method:</i> CTR. Buy America Certification. The Contractor shall provide the Engineer with one copy of a Certified Test Report(s) and Certified Mill Test Reports for all steel materials incorporated into the structure (furnished by supplier). Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Traffic Signal Structure(s): <i>Acceptance Method:</i> CTR. Buy America Certification. The contractor shall provide the Engineer with one copy of a Certified Test Report(s) and Certified Mill Test Reports for all steel materials incorporated into the structure (furnished by supplier). Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Anchor Bolts: <i>Acceptance Method:</i> CTR. The contractor shall provide the Engineer with one copy of a Certified Test Report (furnished by supplier). Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Concrete Footings: Concrete and Reinforcing steel. For large quantities, if cast-in-place cylinders are required, document per Item 601. If Cast-in-Place, initial water cure as per Item 601, or as directed by the Engineer. See the end of the Schedule for small quantities. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Construction Traffic Control Signing & Devices: <i>Acceptance Method:</i> Pre-Approved (Contractor's COC for Documentation). Information available at www.coloradodot.info/business/APL/. Verify in APL Traffic Control Sub-Categories.</p> <p>Lighting Fixtures, Flashing Yellow Beacons, Traffic Signal Systems: <i>Acceptance Method:</i> COC Field-inspect for compliance with plans and specifications and if in doubt, contact Region Traffic Signal Technician / Foreman. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Messenger Cables, Electrical Conduit, Pull Boxes, Direct Burial Cable, Vehicle Detector Wire Loop, Grounding and Bonding, Miscellaneous Hardware, and Barricades: Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Breakaway Sign Structures: <i>Acceptance Method:</i> COC. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p>
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<p style="text-align: center;">615 WATER CONTROL DEVICES</p>	<p>Headgates and Parshall Measuring Flumes: <i>Acceptance Method: <u>COC. Buy America Certification.</u></i> The Contractor shall provide the Engineer with one copy of a <u>Certificate of Compliance (by supplier)</u>. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Embankment Protectors: Follow instructions in Item 603 of Schedule. Follow individual Item specification for any other type.</p>
<p style="text-align: center;">616 SIPHONS</p>	<p>Siphon Pipe (metal and concrete), Siphon Drain Pipe: Follow instructions in Item 603 of Schedule.</p> <p>Trash Guards, Drain Valves, Valve Boxes: Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files. See Standard Specifications Subsection 712.06 and 716.07. <u>Buy America Certification.</u></p> <p>Gaskets: Follow instructions in Item 603 of Schedule.</p>
<p style="text-align: center;">618 PRESTRESSED CONCRETE (STRUCTURES)</p>	<p>Prestressed Concrete Unit: <i>Acceptance Method: <u>Pre-Inspected. Buy America Certification.</u></i> A final report (<u>CDOT Form #193</u>) will be <i>issued by the Staff Bridge Fabrication Inspectors</i> stating that the units comply with the specifications and that the Material reports are on file at CDOT. Call the CDOT Staff Bridge Fabrication Inspectors at (303) 757-9339 for information.</p> <p><i>Prestressed and Pre-Inspected Girder members (units) will bear a CDOT stamp. Girder members will be stamped by CDOT personnel or the designated agent, when Quality Assurance determines that the contract requirements have been met.</i></p> <p>CDOT's Staff Bridge Fabrication Inspectors will notify the Project Engineer or project personnel of any release of girder members planned before the 28-day normal release schedule or specified in the contract documents.</p> <p>Post-Tensioned Members: *All components must meet individual specifications. Post-tensioning data must be documented in Project Files. Concrete - follow instructions in Item 601 of Schedule: <u>except</u> that one set (5) of cylinders are required for each concrete placement. Concrete usually is cast-in-place. <u>See note in Item 601</u> for curing instructions.</p> <p>Reinforcing Steel: Follow instructions in Item 602 of Schedule.</p> <p>Field Post-Tension Elements: *Strand, wire, and bars may be pretested. If not pretested contact Central Laboratory immediately and submit samples at the required frequencies. The Contractor shall provide the Project Engineer with one copy of <u>Mill Test Reports</u>. These reports are to be filed with the CDOT Form #157: (1) the material has been field-inspected and is acceptable, (2) Mill Test Reports are filed, and (3) a tabulation of the quantity used on the project. <u>Buy America Certification.</u></p> <p>* Sampling Frequency: Strand 1-per Heat Number (Sample 5.5 ft. (1.7 m) long, minimum). Include a copy of the <u>Mill Test Report</u> attached with the CDOT Form #157. Wire 1-per 5 ton (5 t) or fraction thereof (sample 30" (760 mm) long). Bars 1 per 5 ton (5 t) or fraction thereof (sample 42" (1070 mm) long). Bars with a diameter greater than 1½ inches will be accepted with a <u>Certified Test Report</u>.</p>

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619 WATER LINES	<p>Cast Iron and Copper Pipe: <i>Acceptance Method:</i> <u>COC. Buy America Certification.</u> Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Welded Steel Pipe: <u>Field-inspect</u> and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files. Welding is performed in field as per AWS, D-1.1.</p> <p>Standard Galvanized Pipe: <i>Acceptance Method:</i> <u>COC. Buy America Certification.</u> Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Thermoplastic Pipe: <i>Acceptance Method:</i> <u>COC. Field inspect PVC or PE pipe for pressure rating, brand name, and NSF rating upon arrival and before use. It is very important that you must carefully check for NSF rating on pipe when plastic pipe is used for potable and city waterline and domestic consumption.</u> Field-inspect and document on CDOT Form #157 that the material is acceptable, retain all copies in the Project Files.</p> <p>Valves and Valve Boxes: <i>Acceptance Method:</i> <u>COC. Buy America Certification.</u> Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p>
622 REST AREAS AND BUILDINGS	<p>Precast Concrete Units, Light Poles, Picnic Tables, and Septic Tanks: <i>Acceptance Method:</i> <u>COC. Buy America Certification.</u> Follow Certificate of Compliance procedure.</p> <p>Structural Glazed Tile, Ceramic Tile, Interior Insulation, Copper Pipe, Cast Iron Pipe, Perforated Drain Pipe: <i>Acceptance Method:</i> <u>COC.</u> The Contractor shall provide the Engineer with one copy of a <u>COC (furnished by supplier)</u>. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Roofing Asphalt: <i>Acceptance Method:</i> <u>COC.</u> The Contractor shall provide the Engineer with one copy of a <u>Certificate of Compliance (furnished by the supplier) stating conformance to ASTM D 312, Type I and III.</u> List all information on CDOT Form # 411 that the material is acceptable and retain all copies in the Project Files.</p> <p>Brick, Concrete Brick, Concrete Block: Check manufacturer, style, number, and color. The contractor shall provide the Engineer with one copy of a <u>Certified Analysis</u> to be filed with CDOT Form #157, retained in Project File. State on CDOT Form #157 that the material has been field-inspected and is acceptable, and that the Certified Analysis is on file. If no Certified Analysis is available, submit 5 brick or block per 10,000 or fraction thereof to the Central Laboratory before use.</p> <p>Mortar Sand: Submit one 33 lb. (15 kg) sample to Central Laboratory before use. Report on CDOT Form #157.</p> <p>Masonry Cement: Must be commercial brand in good condition. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p> <p>Leaching Field Aggregate: Field-inspect and field test to determine compliance with plans and specifications. One field sieve analysis required for each 100 cubic yards or fraction thereof. Report on CDOT Form #6.</p> <p>ALL ITEMS NOT INCLUDED ABOVE: FIELD-INSPECT ACCORDING TO SECTION 622 INSPECTION GUIDELINES OF THE CDOT CONSTRUCTION MANUAL. REPORT ON CDOT FORM #157. REPORT AS MANY ITEMS AS PRACTICAL ON A SINGLE CDOT FORM #157. ATTACH ADDITIONAL SHEETS TO THIS FORM IF NECESSARY. RETAIN IN PROJECT FILE.</p>

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<p style="text-align: center;">623</p> <p style="text-align: center;">IRRIGATION SYSTEM</p>	<p>Irrigation System: <i>Acceptance Method:</i> <u>COC.</u></p> <p>The Contractor shall provide the Engineer with one copy of a <u>Certificate of Compliance (furnished by supplier)</u> to be filed with CDOT Form #157. Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p>
<p style="text-align: center;">624</p> <p style="text-align: center;">DRAINAGE PIPE</p>	<p>Drainage Pipe: <i>Acceptance Method:</i> <u>COC. Buy America Certification.</u> See Item 603 of the Schedule.</p> <p>Note: Item 513 that was discontinued is incorporated into this Section.</p>
<p style="text-align: center;">627</p> <p style="text-align: center;">PAVEMENT MARKING</p>	<p>Glass Beads: <i>Acceptance Method:</i> <u>CTR.</u></p> <p>The Contractor shall provide the Engineer with one copy of <u>Certified Test Reports for Glass Beads (furnished by the supplier)</u> to be filed with CDOT #157. (A letter is now required by Standard Special Provision 106.12 that recycled glass be documented by COC/letter that the recycled glass comes from North American glass waste streams in the United States of America.)</p> <p>Pavement Marking, All Types: <i>Acceptance Method:</i> <u>Pre-Approved (with Contractor's COC for Documentation).</u> <u>Information available at www.coloradodot.info/business/APL/.</u></p> <p>NOTE: Field-inspect and document on CDOT Form #157 that the material is acceptable, then retain all copies in the Project Files.</p>
<p style="text-align: center;">628</p> <p style="text-align: center;">PEDESTRIAN BRIDGES</p>	<p>Pedestrian Bridges: <i>Acceptance Method:</i> <u>COC. Buy America Certification.</u></p> <p>Established through a Project Special.</p> <p>The Contractor shall provide the Engineer one copy of a <u>Certificate of Compliance (furnished by the supplier, if applicable) and Mill Test Reports.</u> Individual components should be inspected and documented where possible. Follow the schedule for the appropriate item, (e.g. concrete, timber, etc.) If the bridge is: Pay Item 628 CIP, and you are unable to identify component parts, or if it is precast or prefabricated at an off-site location, then field inspect for adherence to the plans and specifications or special provisions, as applicable. Document on appropriate CDOT forms, or on a CDOT Form # 157, listing what material items can be readily identified.</p>

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PAY ITEM	TYPE OF TEST	PROJECT VERIFICATION SAMPLING & TESTING FREQUENCY	PROCEDURES		REMARKS	POINT OF VERIFICATION FOR QUALITY DETERMINATION	CENTRAL LAB (CL) [LOCAL AGENCIES ARE TO USE AN ACCREDITED LAB, NOT CDOT CL]	
			PROJECT VERIFICATION SAMPLING	PROJECT VERIFICATION TESTING			TEST FREQUENCY	SAMPLE SIZE
641 SHOTCRETE	COMPRESSIVE STRENGTH	1 per day if less than 50 cu. yds. are placed. Once per 50 cu. yds. or fraction thereof. 3 cores tested at 28 days.	C 1140	C 1140 C 39	<p>Coring of shotcrete panels shall be performed by the contractor. If 28-day strengths are below specified strength, three additional cores will be tested at 56 days.</p> <p>Cores must be delivered to the testing facility 1 work day prior to date of required test for sulfur capping.</p>	Panels shall be field cured. Cores for 28-day strengths are removed 25-27 days after casting. Cores for 56-day strengths are removed 53-55 days after casting.		
	AIR CONTENT	The 1 st three batches at the beginning of a day's production, then 1 per 50 cu. yds. or fraction thereof.	CP 61	T 152	Only for the wet process.	Tested at the point of delivery.		

708 PAINTS	<p>Structural Steel Bridge Paint: <i>Acceptance Method: <u>COC</u>.</i> Inorganic Zinc-Rich Polyurethane System. The Contractor shall provide the Engineer one copy of a <i>Certificate of Compliance</i> (<i>furnished by the supplier or manufacturer</i>) stating that the material complies with Standard Specifications Section 708 and specific requirements stated in the project plans. This information to be filed with the CDOT Form #157. Retain in Project Files.</p>
	<p>Structural Concrete Coating: <i>Acceptance Method: <u>Pre-Approved (Contractor's COC for Documentation)</u>.</i> <i>Information available at www.coloradodot.info/business/APL/.</i></p>

QA FREQUENCY GUIDE SCHEDULE for Minimum Materials Sampling, Testing, and Inspection

Guidelines for Test Frequency Reduction

SCOPE: Some relaxation in inspection and testing procedures may be permitted under certain conditions. Reduced engineering control may be particularly applicable to small quantities of intermittently delivered material on large projects and for contracts covering small projects.

It is intended that the reduced engineering control of sampling and testing procedures be permitted only for relatively small quantities of material that will not adversely affect the Traffic carrying capacity of a completed facility. **Such procedures are not to be permitted in concrete for major structures, permanent mainlines of ramp pavements, or other structurally critical items.**

Reduced inspection and testing frequencies are permissible only under the provisions outlined herein. Utilization of these Guidelines will be at the discretion of the Project Engineer following consultation and approval by the Region Materials Engineer. The Project Engineer will determine the feasibility of reducing any phase of engineering control on his project. His decision should be documented in the project diary and with supplemental documentation as outlined below. Additionally, when materials are approved for test frequency reduction, the supplemental documentation should also include a written concurrence from the RME agreeing with the decision.

SAMPLING AND TESTING OF SMALL QUANTITIES:

The materials listed below may be accepted without further sampling and testing on the basis of visual examination, provided the source has recently furnished or is currently furnishing similar material found to be satisfactory under normal CDOT sampling and testing procedures. *Acceptance Method: **VISUAL***

The maximum quantities of material, which may be accepted by the above method, are:

Item 203 - Compaction:

Project Acceptance Test: 500 cubic yards or less, visually inspect and document in Project Files.

Item 206 - Structure Backfill:

50 cubic yards or less, visually inspect and document in Project Files. Central Laboratory Check Samples: 200 cubic yards or less, field test and document in Project Files.

Item 206 - Filter Material:

Project Acceptance Tests: 50 cubic yards or less, visually inspect and document in Project Files. Central Laboratory Check Samples: 200 cubic yards or less, field test and document in Project Files.

Item 206 - Bed Course Material:

Project Acceptance Tests: 100 cubic yards or less, visually inspect and document in Project Files. Central Laboratory Check Samples: 200 cubic yards or less, field test and document in Project Files.

Item 304 - Aggregate Base Course:

Project Acceptance Tests: Gradation, Atterberg limits and compaction 500 tons or less, visually inspect and document in Project Files.

Item 403 - Hot Mix Asphalt:

All tests, 500 tons or less, visually inspect and document in Project Files. Central Laboratory Check / Assurance Samples: 1,000 tons or less, no sample; greater than 1,000 tons but not exceeding 2,000 tons, one sample; greater than 2,000 tons, and 1 per 10,000 tons or fraction there of (see QA Schedule).

Item 409 - Seal Coat Material:

50 tons or less, visually inspect and document in Project Files. Central Laboratory Check Sample: 200 tons or less, no sample.

Item 411 - Asphalt Materials PG Binder:

AC: 25 tons or less, no sample. MC: 3,000 gallons or less, no sample. Emulsion: 3,000 gallons or less, no sample. Document in Project Files.

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Item 412 - Portland Cement Concrete Pavement:

Slump, air content, and compressive strength, 1,000 square yards or less combining all thicknesses, visually inspect and document in Project Files.

Item 601 - Structural Concrete:

50 cubic yards or less for all Classes of concrete, visually inspect and document in Project Files.

Item 608 - Sidewalks and Bikeways:

PCCP: 250 square yards or less combining all thicknesses of sidewalks, visually inspected and document in the Project Files.

HMA: 500 tons or less, combining all thicknesses of sidewalks, visually inspected and document in the Project Files.

Item 609 - Curb and Gutter:

500 linear feet or less for all Classes of concrete or HMA in the curbing, visually inspect and document in the Project Files.

SAMPLING AND TESTING OF LARGE QUANTITIES:

When a project has an unusually **large** quantity on any items it may be desirable to reduce the testing frequency. The following guidelines are suggested when considering test frequency reduction.

1. Region Materials Engineer, in cooperation with the Project Engineer, should analyze the item or items considered for reduction. The analysis should take into consideration the following:
 - a. The effect of reducing test frequency when analyzing a lot for price reduction. The minimum testing frequencies listed in the Frequency Guide Schedule for Minimum Materials Sampling, Testing, and Inspection.
 - b. Overall importance to the finished project should be considered because a reduction in test frequency could possibly allow some out of specification material to be incorporated into the project.
 - c. A source being used to supply material that has a **proven record** of supplying specification material.
2. When the determination is made that a reduced testing frequency is warranted, the Region Materials Engineer should submit a written request to the Materials and Geotechnical Branch Manager for approval. After approval has been obtained from the Materials and Geotechnical Branch Manager, testing will begin using the normal frequency until good control is established. As soon as five consecutive tests indicate no deviation from specification, reduced test frequencies can begin. If a test indicates deviation from specification, normal frequency will be immediately reinstated until five consecutive tests are within specifications. It is not the intent of these guidelines to suggest that a reduction in testing frequency be made on all projects where a large quantity occurs on an item. **This should only be used in isolated cases where it would be impractical to take the normal number of tests.**

QA FREQUENCY GUIDE SCHEDULE for Minimum Materials Sampling, Testing, and Inspection

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