

IA FREQUENCY GUIDE SCHEDULE for Evaluation of OA Sampling & Testing

| ITEM | DESCRIPTION | TYPE OF TEST REQUIRED | MINIMUM SAMPLING FREQUENCY | FORM # | REMARKS |
|------------|-------------------------------|---------------------------|---|------------|---|
| 203 | EMBANKMENT | % Compaction | 1 per 100,000 cu. yds. (75,000 m ³), or a fraction thereof greater than 10,000 cu. yds. (7,500 m ³), None required if plan quantity is less than 10,000 cu. yds. (7,500 m ³), | 427 | Use the same location for % Compaction. Verify curve selection. |
| 206 | STRUCTURE BACKFILL (Class I) | Gradation % Compaction | 1 per 10,000 cu. yds. (7,500 m ³), or a fraction thereof greater than 1,000 cu. yds. None required if plan quantity is less than 2,000 cu. yds. (750 m ³). | 565 427 | Split the gradation sample. Use the same location for % Compaction. Verify curve selection. |
| 206 | STRUCTURE BACKFILL (Class II) | % Compaction | 1 per 10,000 cu. yds. (7,500 m ³), or a fraction thereof greater than 1,000 cu. yds. None required if plan quantity is less than 2,000 cu. yds. (750 m ³). | 427 | Use the same location for % Compaction. Verify curve selection. |
| 206 | FILTER MATERIAL | Gradation | 1 per 2,000 cu. yds. (1,500 m ³), or a fraction thereof greater than 200 cu. yds. None required if plan quantity is less than 1,000 cu. yds. (750 m ³). | 565 | Split the gradation sample. |
| 304 | AGGREGATE BASE COURSE | Gradation % Compaction | 1 per 20,000 tons (20,000 t), (10,000 cu. yds.) or a fraction thereof greater than 2,000 tons (2,000 t), (1,000 cu. yds.). None required if plan quantity is less than 10,000 tons (10,000 t), (5,000 cu. yds.). | 565 427 | Split the gradation sample. Use the same location for % Compaction. Verify curve selection. |
| 306 | RECONDITIONING | % Compaction | 1 per 50,000 sq. yds. (40,000 m ²), or a fraction thereof greater than 5,000 sq. yds. (4,000 m ²). None required if plan quantity is less than 25,000 sq. yds. (20,000 m ²). | 427 | Use the same location for % Compaction. Verify curve selection. |

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|------------|--|---|---|---------------------------------------|---|
| 307 | LIME TREATED SUB-GRADE | % Compaction | 1 per 50,000 sq. yds. (42,000 m ²), or a fraction thereof greater than 5,000 sq. yds. (4,200 m ²). None required if plan quantity is less than 25,000 sq. yds. (20,000 m ²). | 427 | Use the same location for % Compaction. Verify curve selection. |
| 308 | PORTLAND CEMENT or FLYASH TREATED BASE [Project Special] | Gradation % Compaction | 1 per 50,000 tons (50,000 t) or a fraction thereof greater than 5,000 tons (5,000 t). None required if plan quantity is less than 5,000 tons (5,000 t). | 565 427 | Split the gradation sample. Use the same location for % Compaction. Verify curve selection. |
| 310 | FULL DEPTH RECLAMATION [Project Special] | % Compaction | 1 per Project or as determined by the RME. | 427 | Use the same location for % Compaction. Verify curve selection. |
| 403 | HOT MIX ASPHALT (HMA) - VOIDS ACCEPTANCE PROJECT Basis | % Asphalt Maximum Specific Gravity Air Voids Voids in Mineral Aggregate % Compaction Joint Density | 1 per 10,000 tons (10,000 t), or a fraction thereof greater than 2,500 tons (2,500 t). None required if plan quantity is less than 2,500 tons (2,500 t). | 1304 428 or 582 1290 | Split the sample. Use the same location for % Compaction. Take an adjacent core for joint density. |
| 403 | HOT MIX ASPHALT (HMA) - VOIDS ACCEPTANCE SYSTEM Basis | % Asphalt Maximum Specific Gravity Air Voids Voids in Mineral Aggregate % Compaction Joint Density | 1 per 25,000 tons (25,000 t), or a fraction thereof greater than 2,500 tons (2,500 t), and perform at a minimum one IA every two months on each HMA project tester and their equipment. None required if plan quantity is less than 2,500 tons (2,500 t). | 1304 428 or 582 1290 | Split the sample. Use the same location for % Compaction. Take an adjacent core for joint density. |

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| ITEM | DESCRIPTION | TYPE OF TEST REQUIRED | MINIMUM SAMPLING FREQUENCY | FORM # | REMARKS |
|------------|--|--|---|---------------|---|
| 403 | HOT MIX ASPHALT (HMA) & SMA GRADATION ACCEPTANCE PROJECT Basis | % Asphalt Maximum Specific Gravity Gradation | 1 per 10,000 tons (10,000 t), or a fraction thereof greater than 2,500 tons (2,500 t). None required if plan quantity is less than 2,500 tons (2,500 t). | 1304 | Split the sample. Use the same location for % Compaction. Take an adjacent core for joint density. |
| | | % Compaction | | 428 or 582 | |
| | | Joint Density | | 1290 | |
| 403 | HOT MIX ASPHALT (HMA) & SMA GRADATION ACCEPTANCE SYSTEM Basis | % Asphalt Maximum Specific Gravity Gradation | 1 per 25,000 tons (25,000 t), or a fraction thereof greater than 2,500 tons (2,500 t), and perform at a minimum one IA every two months on each HMA project tester and their equipment. None required if plan quantity is less than 2,500 tons (2,500 t). | 1304 | Split the sample. Use the same location for % Compaction. Take an adjacent core for joint density. |
| | | % Compaction | | 428 or 582 | |
| | | Joint Density | | 1290 | |
| 405 | HOT-IN-PLACE RECYCLE | % Compaction Maximum Specific Gravity | 1 per 50,000 sq. yds. (40,000 m ²), or a fraction thereof greater than 5,000 sq. yds. (4,000 m ²). None required if plan quantity is less than 25,000 sq. yds. (20,000 m ²). | 428 or 582 | Use the same location for % Compaction. Split the HMA sample. |
| 406 | COLD ASPHALT PAVEMENT (RECYCLE) | % Compaction | 1 per 50,000 sq. yds. (40,000 m ²), or a fraction thereof greater than 5,000 sq. yds. (4,000 m ²). None required if plan quantity is less than 25,000 sq. yds. (20,000 m ²). | 427 | Use the same location for % Compaction. Witness CP 53 is being conducted correctly. |

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| ITEM | DESCRIPTION | TYPE OF TEST REQUIRED | MINIMUM SAMPLING FREQUENCY | FORM # | REMARKS |
|---------|---|---|---|--------|-----------------------------|
| 409 | CHIP SEAL COVER COAT MATERIAL - AGGREGATE | Gradation Flat and Elongated Particles | 1 per 5,000 tons (5,000 t), or a fraction thereof greater than 500 tons (500 t). None required if plan quantity is less than 1,200 tons (1,200 t). 1 per 285,000 sq. yds. (230,000 m ²). None required if plan quantity is less than 62,500 sq. yds. (50,000 m ²). | 565 | Split the gradation sample. |
| | | | | | |
| 403-411 | ASPHALT MATERIALS | Determined by Central Laboratory | <p>Asphalt Cement / Performance Graded Binder & Emulsion for Chip Seal Coat and Cold-In-Place Recycling: Project acceptance sampling will be witnessed by the Region IA Tester, and documented on CDOT Form #411.</p> <p>Project Basis: 1 per 20,000 tons (20,000 t), or a fraction thereof greater than 2,500 tons (2,500 t) per binder type. None required if plan quantity is less than 2,500 tons (2,500 t).</p> <p>System Basis: A minimum of one per two months per tester or one per binder grade. None required if plan quantity is less than 2,500 tons (2,500 t).</p> | 411 | |

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| ITEM | DESCRIPTION | TYPE OF TEST REQUIRED | MINIMUM SAMPLING FREQUENCY | FORM # | REMARKS |
|------|---|---|--|---|--|
| 412 | PORTLAND CEMENT CONCRETE PAVEMENT (PCCP) (Compressive Strength Alternative) | Air Content Slump Compressive Strength | 1 set of cylinders per 50,000 sq. yds. (40,000 m ²), or a fraction thereof greater than 5,000 sq. yds. (4,000 m ²) for all thicknesses. None required if total plan quantity for all thicknesses is less than 5,000 sq. yds. (4,000 m ²). | 82 | May use the same sampling container or a split sample. |
| | | Sand Equivalency | | | |
| | | (Flexural Strength Alternative) | Air Content Slump Flexural Strength | 1 set of beams per 50,000 sq. yds. (40,000 m ²), or a fraction thereof greater than 5,000 sq. yds. (4,000 m ²) for all thicknesses. None required if total plan quantity for all thicknesses is less than 5,000 sq. yds. (4,000 m ²). | 83 |
| 503 | DRILLED CAISSONS | Air Content (when specified by the contractor) Slump Compressive Strength | 1 set of cylinders per 2,000 cu. yds. (1,500 m ³), or a fraction thereof greater than 200 cu. yds. (150 m ³). None required if plan quantity is less than 500 cu. yds. (380 m ³). | 82 | May use the same sampling container or a split sample. |
| 601 | STRUCTURAL CONCRETE | Air Content Slump Compressive Strength | 1 per 2,000 cu. yds. (1,500 m ³), or fraction thereof greater than 500 cu. yds. for each Class. No tests required if the quantity is less than 500 cu. yds. for each class. <u>Exception</u> : 1 test minimum if the total quantity of all classes is greater than 500 cu. yds. (380 m ³). | 82 | May use the same sampling container or a split sample. |

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| ITEM | DESCRIPTION | TYPE OF TEST REQUIRED | MINIMUM SAMPLING FREQUENCY | FORM # | REMARKS |
|------------|--|--|--|--------|--|
| 606 | GUARDRAIL (Cast In-Place) | Compressive Strength Air Content Slump | 1 per 10,000 linear feet (3,000 m) or a fraction thereof greater than 1,000 linear feet (300 m). None required if plan quantity for all classes is less than 3,000 linear feet (900 m). | 82 | May use the same sampling container or a split sample. |
| 608 | SIDEWALKS & BIKEWAYS (PCCP) | Air Content Slump Compressive Strength | 1 per 10,000 sq. yds. (8,000 m ²), or a fraction thereof greater than 1,000 sq. yds. (800 m ²). None required if total plan quantity for all classes and for all thicknesses is less than 3,000 sq. yds. (2,500 m ²) | 82 | May use the same sampling container or a split sample. |
| | (HMA) | AC Content Gradation | 1 per project. None required if total plan quantity is less than 2,500 tons (2,500 t). | 1304 | Split the HMA sample. |
| 609 | CURB AND GUTTER (PCCP) | Air Content Slump Compressive Strength | 1 per project. None required if plan quantity is less than 10,000 linear ft. (3,000 m). | 82 | May use the same sampling container or a split sample. |
| | (HMA) | AC Content Gradation | 1 per project. None required if total plan quantity is less than 2,500 linear ft. (40 t). | 1304 | Split the HMA sample. |
| 618 | PRESTRESSED CONCRETE (STRUCTURES) (Cast In-Place) | Air Content Slump Compressive Strength | 1 per 2,000 cu. yds. (1,500 m ³), or a fraction thereof greater than 200 cu. yds. (150 m ³). None required if plan quantity is less than 500 cu. yds. (380 m ³). | 82 | May use the same sampling container or a split sample. |

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- NOTE 1** - When all Items subject to Independent Assurance Sampling on a particular project have quantities less than the minimums set forth in the OA Frequency Guide Schedule for Minimum Materials Sampling, Testing, and Inspection, no IA Samples are required. However, on such projects the Region Materials Engineer will fill in the heading on a CDOT Form #379 and write across the face of this form a statement to the effect that "*No Independent Assurance samples were taken because of the small quantities involved.*" This will fulfill Independent Assurance requirements on this project.
- NOTE 2** - Independent Assurance testing should be accomplished by the same method used for Owner Acceptance (OA) at the Point of Verification or Acceptance listed for each Item in the OA Frequency Guide Schedule for Minimum Materials Sampling, Testing, and Inspection in the Field Materials Manual. Sampling shall be accomplished using CDOT approved sampling methods outlined in the FMM. All samples shall be split with the field tester (OA) and run independently by personnel who have no direct responsibility for Quality Assurance or Verification sampling and testing for the project.
- NOTE 3** - For Item 403 – 411: Local Agency (LA) projects on Colorado State Highways as well as the National Highway System (NHS) shall have the IA's performed by CDOT. The binder and emulsion samples shall be sent to the Central Lab.
- NOTE 4** - Refer to the CDOT Independent Assurance Job Manual for specific item testing information and techniques.

IA FREQUENCY GUIDE SCHEDULE for Evaluation of OA Sampling & Testing

TABLE IA – 1, Comparison Precision Guide

| Element | Type of Test | Minor Difference | Significant Difference |
|---|---|------------------------------|------------------------------|
| Gradation | Sieve Analysis per CP 31 Nominal Maximum 1-1/2" to 1/2" 3/8" to #16 #30 to #100 | ≤ 1% ≤ 3% ≤ 6% ≤ 3% | > 1% > 3% > 6% > 3% |
| | Sieve Analysis per CP 31 #200 NOTE: # 200 (Item 409 per CP 31) | ≤ 3% ≤ 0.5% | > 3% > 0.5% |
| Asphalt Content | Asphalt Content Gauge per CP 85 Ignition Method per CP-L 5120 | ≤ 0.30% | > 0.30% |
| Maximum Specific Gravity | Flask per CP 51 | ≤ 0.019 | > 0.019 |
| Asphalt Compaction | M/D Gauge per CP 81 Cores per CP 44 | ≤ 2.0% | > 2.0% |
| Asphalt Compaction at Longitudinal Joints | Cores per CP 44 | ≤ 2.5% | > 2.5% |
| Air Voids | Per CP-L 5115 | ≤ 1.3% | > 1.3% |
| Voids in Mineral Aggregate | Per CP 48 | ≤ 1.2% | > 1.2% |
| Cold In-Place recycling | M/D Gauge per CP 81 | ≤ 2.0% | > 2.0% |
| | | | |

IA FREQUENCY GUIDE SCHEDULE for Evaluation of OA Sampling & Testing

TABLE IA – 1, Comparison Precision Guide (continued)

| Element | Type of Test | Minor Difference | Significant Difference |
|---------------------------|------------------------------------|---|--|
| Sand Equivalent | Sand Equivalent per CP 37 | ≤ 5 points | > 5 points |
| Slump | Slump Cone per AASHTO T 119 | ≤ 1/2" | > 1/2" |
| Air Content | Air Meter per AASHTO T 152 | ≤ 0.5% | > 0.5% |
| Compressive Strength | Compressive Strength per ASTM C 39 | Average QA within ±10% of average IA | Average QA test result >10% of average IA test result |
| Flexural Strength | Flexural Strength per AASHTO T 97 | Average QA within ±10% of average IA | Average QA test result >10% of average IA test result |
| Soil Compaction | M/D Gauge per CP 80 | ≤ 2.0% | > 2.0% |
| Aggregate Base Compaction | M/D Gauge per CP 80 | ≤ 2.0% | > 2.0% |

NOTE: Data based on Empirical Bayesian Statistics and is subject to change as the database increases. Table 1 was reviewed in 2018 based on data from the 2015, 2016, and 2017 construction season for the 2020 FMM.

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