

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF MATERIALS ENGINEERING

Federal Aid, State Funds, County/Municipal Federal Aid Projects and State Aid Projects

This schedule outlines the minimum sampling and testing required for most materials used in highway construction. Some items that are rarely used or materials of recent development are often covered by special provisions and may not be shown on the schedule. For more information regarding contract requirements for testing, please reference the "Standard Specifications for Construction"; Specification 1603 Materials: Specifications, Samples, Tests, and Acceptance. When sample sizes required for testing exceed 35 pounds, please submit multiple containers of the material with no individual container weighing more than 35 pounds.

Small quantities of materials may be accepted without sampling and testing. A small quantity is defined as any total quantity, for the whole project, of one material, which is smaller than the minimum quantity required for testing unless modified by the individual material items. These materials shall be from known, reliable sources, perform satisfactorily and meet the requirements for purpose intended. The inspection report (Form 02415) should include a statement to this effect and show the source. Form 2403 may be used to report small quantities of diverse materials from different sources. Form 02415 and Form 2403 (or approved revisions) are referenced in the Schedule of Materials Control for project record documentation and are required to be maintained in the project file.

Where items of small quantity are used in a critical location or significantly influence the safety, performance, strength or durability of major construction items, prior approval for their use without testing must be obtained.

Previously approved materials transferred from another project should be reported on Form 02415. The report should include: type of material, quantities involved, source, and supplier of materials. Whenever possible, include the project number for which the material was originally approved.

A TELEPHONE INDEX is included with the Schedule giving the numbers of contact persons if further information is required regarding the various materials. A form index is also included.

A website (www.mrr.dot.state.mn.us) has been established for the Office of Materials. The contributing units to the Materials Control Schedule from the Pavement Engineering Section are the Bituminous Engineering Unit, the Concrete Engineering Unit, and the Grading & Base Unit. The Materials Engineering Unit contains the Approved Products and the Certified Products and Services List, as well as, the Materials Control Schedule.

Products manufactured offsite may be pre-approved, however, final acceptance will be made at the point of incorporation, based upon review of documentation and inspection for shipping or other damage.

PLEASE CONTACT THE Mn/DOT DISTRICT INDEPENDENT ASSURANCE INSPECTOR WHEN PROJECT STARTS TO PROVIDE THE PROPER SERVICING OF YOUR PROJECT.

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TELEPHONE INDEX FOR SCHEDULE OF MATERIALS CONTROL

Section	Page	Section Name	Contact	Phone
Part I	Page 1	Grading & Base	Tim Andersen Cary Efta	(651) 779-5609 (651) 779-5332
Website: www.mrr.dot.state.mn.us/pavement/GradingandBase/gradingandbase.asp				
Part II Part II B 4	Page 5 Page 7	Bituminous - Spec. 2360 Asphalt Binder	John Garrity Jim McGraw	(651) 779-5577 (651) 779-5548
Website: www.mrr.dot.state.mn.us/pavement/bituminous/bituminous.asp				
Part III	Page 11	Seal Coating – Spec 2356	Tom Wood	(651) 779-5573
Part IV	Page 15	Concrete – Aggregates and Mix Design Concrete – Certified Ready Mix Concrete – Paving Concrete – Bridges	Wendy Garr Wendy Garr Maria Masten Ron Mulvaney	(651) 779-5335 (651) 779-5335 (651) 779-5572 (651) 779-5575
Website: www.mrr.dot.state.mn.us/pavement/concrete/concrete.asp				
Changed Title of Agricultural Items to Landscaping and Erosion Control Items				
Part V	Page 24	Landscaping and Erosion Control Items Erosion Control Landscaping	Lori Belz Scott Bradley	(651) 284-3757 (651) 284-3758
Part VI	Page 28	Chemical Items	Jim McGraw Dave Iverson	(651) 779-5548 (651) 779-5550
Part VII	Page 30	Metallic Materials and Metal Products Sampling Test Results Bridge Structural Metals	Terry Beaudry Laboratory Todd Niemann	(651) 779-5610 (651) 779-5560 (651) 747-2132
Part VIII	Page 32	Miscellaneous Materials Sections 1 thru 3 Section 4 Test Results	Terry Beaudry Todd Nieman Laboratory	(651) 779-5610 (651) 747-2132 (651) 779-5560
Part IX	Page 33	Geosynthetics, Pipe, Tile, and Precast/Prestressed Concrete Sections 1 thru 5 and 8 thru 11 Sections 6, 7 Section 12 Section 13 Test Results	Steve Grover Terry Beaudry Randy Tilseth Lori Belz Laboratory	(651) 779-5540 (651) 779-5610 (651) 779-5604 (651) 284-3757 (651) 779-5560
Part X	Page 37	Brick, Stone and Masonry Units/ Modular Retaining Wall Blocks Sections 1, 2A & 4 Section 2B Section 3 Test Results	Terry Beaudry Blake Nelson Steve Grover Laboratory	(651) 779-5610 (651) 779-5599 (651) 779-5540 (651) 779-5561
Part XI	Page 38	Electrical & Signal Construction Items Sections 1, 8-11 Section 2 Section 3 Sections 4-7 Test Results	Susan Zarling Steve Grover Wendy Garr Terry Beaudry Laboratory	(651) 582-1282 (651) 779-5540 (651) 779-5335 (651) 779-5610 (651) 779-5560

Form Index

Form No.	Form Name
02115-03	Grading & Base Report
2152	Concrete Batching Report
02154-02	Random Sampling Gradations
2162	Concrete Test Beam Data
2170-02	Penetration Index Method - Aggregate Base & Edge Drains
02402-03	Work Sheet for Sieve Analysis of Granular Material
2403	Inspection Report for Small Quantities (May be used for documentation or use another method to capture required documentation)
2409	ID Card Concrete Test Cylinder
2410	Sample ID Card
2413	Asphalt Sample Identification Card
02415	Inspection Report on..... (May be used for documentation or use another method to capture required documentation)
2448	Weekly Concrete Report
2449	Weekly Concrete Aggregate Report (QC/QA)
02463	Percent Crushing Report
21412	Weekly Report of "Low Slump Concrete"
21764	Concrete Aggregate Worksheet JMF
24143	Weekly Certified Ready-Mix Plant Report (Verification)
24300	ID Card Cement Samples
24308	ID Card Fly Ash Samples
24327	Field Core Report
24346-02	Certificate of Aggregates & Granular Materials
24587-01	Calculation for Moisture - Density Relationships in Subgrade Soils and Aggregate Base and Shoulders
	Microwave Oven Worksheet

SCHEDULE OF MATERIALS CONTROL

I. GRADING AND BASE CONSTRUCTION ITEMS (www.mrr.dot.state.mn.us/pavement/GradingandBase/gradingandbase.asp)

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

Material	Spec. No.	Form No. (See Note 6)	Minimum Required Contractor Quality Control Testing (QC) (Production Testing Rate)		Minimum Required Agency Acceptance Testing (QA) (Field Testing Rate)		Minimum Required Laboratory Testing (See Note 1)	Sample Size for Testing (See Note 7)	
			Metric	English	Metric	English		Metric	English
1. GRADATION (5-692.210 to .215) (a) Aggregate Surfacing (2118) (b) Aggregate Base (2211) (c) Aggregate Shoulders (2221)	3138 & Special Provisions	02115-03, 02154-02, & 24346-02	1/1,000 t or 1/460 m ³ (CV)	1/1,000 ton or 1/550 yd ³ (CV)	Random Sampling Gradation Acceptance Method (See Spec. 2211.3F) & (5-692.700)		1 per source (Salvage Bit. See Note 3)	10-15 kg	25 lb.
(d) Stabilizing Aggregate (2105)	3149 & Special Provisions								
(e) Open Graded Aggregate Base (OGAB)	Special Provisions	02115-03 & 24346-02	1 per source before placing on project Contractor is encouraged to perform additional tests for process control.		1/1,000 t or 1/460 m ³ (CV) (See Note 2)	1/1,000 ton or 1/550 Yd ³ (CV) (See Note 2)	1 per source	10-15 kg	25 lb.
(f) Granular Borrow Select Granular Borrow (2105)	3149 & Special Provisions				Less than 115,000 m ³ (CV) 1/8,000 m ³ 115,000 m ³ (CV) or more 1/15,000 m ³ (See Note 2)	Less than 150,000 Yd ³ (CV) 1/10,000 Yd ³ 150,000 Yd ³ (CV) or more 1/20,000 Yd ³ (See Note 2)	1 per source (Salvage Bit. See Note 3)	10-15 kg	25 lb.
(g) Bituminous Pavement Reclamation (Full Depth Reclamation)	2331 & Special Provisions	02115-03 & 02402-03	1/5,000 m ² (See Note 4)	1/6,000 Yd ² (See Note 4)	1/10,000 m ²	1/12,000 Yd ²	None	None	
(h) Granular Filter	3601 & Special Provisions	02115-03 & 24346-02	1 per source before placing on project Contractor is encouraged to perform additional tests for process control.		1 per source (See Note 2)		1 per source	10-15 kg	25 lb.

SCHEDULE OF MATERIALS CONTROL

I. GRADING AND BASE CONSTRUCTION ITEMS (Cont'd)

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

Material	Spec. No.	Form No. (See Note 6)	Minimum Required Contractor Quality Control Testing (QC) (Production Testing Rate)		Minimum Required Agency Acceptance Testing (QA) (Field Testing Rate)		Minimum Required Laboratory Testing (See Note 1)	Sample Size for Testing (See Note 7)	
			Metric	English	Metric	English		Metric	English
(i) Granular Backfill (2451) (j) Aggregate Backfill (2451) (k) Granular Bedding (2451) (l) Aggregate Bedding (2451) (m) Coarse Filter (2451) (n) Fine Filter (2502) (o) Sand Cover (2206)	3149	02115-03 & 24346-02	1 per source before placing on project Contractor is encouraged to perform additional tests for process control.		1 per source (See Note 2)		1 per source (Salvage Bit. See Note 3) 1 per source	10-15 kg	25lb
2. MOISTURE-DENSITY TEST (Required for Specified Density) (Proctor) (5-592.221 & .222) (a) Aggregate Base (b) Aggregate Shoulder (c) Embankment Soil	2211 2221 2105	24587-01	Contractor is encouraged to perform proctor tests for process control.		1/40,000 t or 1/18,400 m ³ (per source)	1/40,000 ton or 1/22,000 Yd ³ (per source)	One sample minimum and additional samples as required Two samples per project and additional samples as required	25-30 kg	50 lb.
3. RELATIVE DENSITY TEST (Required for Specified Density) (5-692.251) (a) Aggregate Base (b) Aggregate Shoulder (c) Embankment Soil (Excavation & Borrow)	2211 2221 2207 2105 & Special Provisions	02115-03	Contractor is encouraged to perform density tests for process control.		1/1,800 t or 1/800 m ³ (CV)	1/1,800 ton or 1/1,000 Yd ³ (CV)	None	None	
4. Penetration Index Method (DCP) (5-692.255) (a) Aggregate Base (b) Aggregate shoulders	2211 2221	02115-03 & 2170-02	Contractor is encouraged to perform DCP tests for process control.		2 DCP tests/ 1,800 t or 800 m ³ (CV)	2 DCP tests/ 1,800 ton or 1,000 Yd ³ (CV)			

SCHEDULE OF MATERIALS CONTROL

I. GRADING AND BASE CONSTRUCTION ITEMS (Cont'd)

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

Material	Spec. No.	Form No. (See Note 6)	Minimum Required Contractor Quality Control Testing (QC) (Production Testing Rate)		Minimum Required Agency Acceptance Testing (QA) (Field Testing Rate)		Minimum Required Laboratory Testing (See Note 1)	Sample Size for Testing (See Note 7)	
			Metric	English	Metric	English		Metric	English
(Continued) 4. Penetration Index Method (5-692.255) (DCP) (c) Bituminous Pavement Reclamation (Full Depth Reclamation)	2331 & Special Provisions	02115-03 & 2170-02	Contractor is encouraged to perform DCP tests for process control.		2 DCP tests/ 5,000 m ²	2 DCP tests/ 6,000 Yd ²	None	None	
(d) Fine Filter Aggregate (Edge Drains)	2331 & Special Provisions				See Special Provisions				
5. RELATIVE MOISTURE (Required for Specified Density) (5-692.253) (a) Aggregate Base (b) Aggregate Shoulder	2211 2221	02115-03	Contractor is encouraged to perform moisture tests for process control.		1/1,800 t or 1/800m ³ or 10 tests whichever is less	1/1,800 ton or 1/1,000 yd ³ or 10 tests whichever is less			
(c) Embankment Soil (Excavation & Borrow)	2105				1/3,000 m ³ (CV)	1/4,000 Yd ³ (CV)			
6. Moisture Content, (DRY WEIGHT) (Required for Quality Compaction & Penetration Index Method) (5-692.245) (a) Aggregate Base (b) Aggregate Shoulder	2211 2221				Contractor is encouraged to perform moisture tests for process control.				
(c) Bituminous Pavement Reclamation (Full Depth Reclamation)	2331 & Special Provisions			1/5,000 m ²	1/6,000 Yd ²				
7. Percent Crushing (a) Belt Samples (5-692.203)	3138, 3149 & Special Provisions	02463 & 24346-02	One Per Day (See Note #8)						
(b) Particle Count (5-692.204)									
8. AGGREGATE (Quality Tests)	3138 & Special Provisions		Contractor is encouraged to perform aggregate quality tests for process control.		None		1 per source	10-15 kg (See Note 5)	25 lb. (See Note 5)

SCHEDULE OF MATERIALS CONTROL

I. GRADING AND BASE CONSTRUCTION ITEMS (Cont'd)

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

NOTE 1: Laboratory samples are not required for 1,000 metric ton [1,000ton] or 600m³ (LV) [714 Cu Yd (LV)] or 460m³ (CV) [550 Cu Yd (CV)] or less. The first laboratory sample shall be taken within the first 3,000 metric ton [3,000 ton] and all laboratory samples shall have a **field companion sample**. The field sample results must be included with the laboratory sample. The allowable field-lab tolerances are in the Mn/DOT Grading & Base Manual at:

Sieve Analysis Procedure (Gradation) 5-692.215
Sampling for Moisture-Density Test (Proctor) 5-692.221

NOTE 2: Samples are not required for 500 ton or less. Report small quantities on form 02415 or 2403.

NOTE 3: If salvaged bituminous material is used, submit a laboratory companion to the first Acceptance Gradation sample for a bituminous extraction. Bituminous extraction requirements shall not apply to Bituminous Pavement Reclamation (Full Depth Reclamation).

NOTE 4: When required in the Special Provisions

NOTE 5: When the aggregate material is carbonate sand in 23 kg [50 lbs.] to the lab.

NOTE 6: All forms are available on the Grading & Base website at:

www.mrr.dot.state.mn.us/pavement/GradingandBase/gradingandbase.asp

NOTE 7: Sample size for testing each split sample. (i.e.; 25 lb Gradation Test Sample + 25 lb Companion Sample = 50 lb Field Sample).

NOTE 8: No percent crushing test will be required when the material is crushed from a source meeting the requirements of class A or class B in 3137.2B or 3139.2A2.

SCHEDULE OF MATERIALS CONTROL

II. BITUMINOUS CONSTRUCTION ITEMS FOR SPECIFICATION 2360 (Note #1)

(All bituminous mixtures are from Certified Plants) (www.mrr.dot.state.mn.us/pavement/bituminous/bituminous.asp)

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

DEFINITIONS

SAMPLE TYPE	DESCRIPTION	SAMPLE LOCATION DETERMINED BY	SAMPLE TAKEN BY	SAMPLE TESTED BY
QC	Quality Control Testing performed by Contractor. Also known as Process Control Testing.	Contractor	Contractor	Contractor
QA	Quality Assurance Testing performed by the Agency. This test is performed on a companion sample to the Contractor's QC sample.	Contractor	Contractor	Agency
Verification	A sample to assure compliance of the Contractor's Quality Control program. The results shall be included as part of the QA Testing Program.	Agency	Agency	Agency
Verification Companion	A companion sample to the Agency's Verification sample provided to the Contractor. The Contractor <u>is required</u> to test this sample. The results <u>shall be used</u> as part of the QC program.	Agency	Agency	Contractor
IAST	The <u>I</u> ndependent <u>A</u> ssurance <u>S</u> ampling and <u>T</u> esting assures testers are sampling and testing properly and that equipment is calibrated correctly.	Agency	Contractor or Agency	Contractor or Agency

A. PRE-PRODUCTION SAMPLING AND TESTING for Specification 2360

- SAMPLE SIZE:** 35 kg (75 lb.) - plus #4 aggregate sample for quality testing and Percent Crushing
 15 kg (35 lb.) - minus #4 aggregate for quality testing
 18 kg (40 lb.) - bituminous mixture plus 3 Marshall specimens for volumetric testing (Marshall)
 33 kg (70 lb.) - bituminous mixture plus 2 Gyrotory specimens for volumetric testing (Gyrotory)
 35 kg (75 lb.) - bituminous mixture for TSR testing (option A)
 8 kg (18 lb.) - bituminous mixture for TSR testing plus 9 Marshall specimens (option B) (Marshall)
 8 kg (18 lb.) - bituminous mixture for TSR testing plus 6 Gyrotory specimens (option B) (Gyrotory)
 1 kg (2 lb.) - for mineral filler.

SCHEDULE OF MATERIALS CONTROL

II. BITUMINOUS CONSTRUCTION ITEMS FOR SPECIFICATION 2360 (Note #1) (Part A, cont'd)

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

<p>1. Bituminous Mix Design (QC/QA)</p> <p><u>QC Testing</u></p> <p>REMARKS: Mix Design for Spec. 2360 is Contractor's responsibility with review by Mn/DOT.</p> <p><u>QA Testing</u></p> <p>Test Contractor's samples at optimum Asphalt Content, TSR, plus 3 Marshall specimens submitted along with Trial Mix data for review (Marshall).</p> <p>Test Contractor's samples at optimum Asphalt Content, TSR, plus 2 Gyratory specimens submitted along with Trial Mix data for review (Gyratory).</p>
<p>2. Aggregate Quality Testing (QA Only)</p> <p><u>QA Testing</u></p> <p>Contractor shall provide 24 hour notice of intent to sample aggregates for quality testing. Agency has the option to monitor sampling.</p> <p>Contractor submits to the Bituminous Engineer or the District Materials Engineer one (1) sample of each non-asphaltic aggregate type or class per source per year. Quality testing will be performed as directed by the Bituminous Engineer or the District Materials Engineer. When aggregate qualities approach specification limits or when material variation is observed, take additional field samples.</p>
<p>3. Mineral Filler (QA Only)</p> <p><u>QA Testing</u></p> <p>One (1) per shipment of 45 metric tons (50 tons) or less, unless previously inspected.</p>
<p>4. Additives (QA Only)</p> <p><u>QA Testing</u></p> <p>1 L (1 qt.) of blended asphalt binder and additive. Sample first shipment of each type of material, then submit one sample per 1,000 m³ (250,000 gal.) (approximately 1,000 ton)</p>

SCHEDULE OF MATERIALS CONTROL

II. BITUMINOUS CONSTRUCTION ITEMS FOR SPECIFICATION 2360 (Note #1) (Cont'd)
 (All bituminous mixtures are from Certified Plants)

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

B. BITUMINOUS PRODUCTION for Specification 2360

- SAMPLE SIZE:** 15 kg (35 lb.) for Aggregate for Gradation (QC/QA)
 35 kg (75 lb.) for each plus #4 Aggregate Type for Quality Testing
 15 kg (35 lb.) for each minus #4 Aggregate Type for Quality Testing
 20 kg (45 lb.) for Mixture Properties (QC/QA) 2 full 6" by 12" cylinder molds for QA (Marshall mixes)
 30 kg (65 lb.) for Mixture Properties (QC/QA) 3 full 6" by 12" cylinder molds for QA (Gyratory mixes)
 40 kg (90 lb.) for TSR (QC/QA) 4 full 6" by 12" cylinder molds for QA
 40 kg (90 lb.) for Aggregate Specific Gravity (QC/QA)
 1 L (1 qt) for Asphalt Binder (QA)
 2 L (1/2 gal) for Asphalt Emulsion (QA)

<p>1. Plant Mix Aggregate Gradation Testing (QC/QA, Verification*) <u>QC Testing</u> 1 per 900 metric tons (1000 tons) at start of production 1 per 1,800 metric tons (2,000 tons) or portion thereof per mix blend as required by 2360.4E6 1 per 900 metric tons (1000 tons) when operating under corrective action. Companion samples taken for agency. REMARKS: See Note #2 & Note #3, <u>QA Testing</u> Companions to QC samples set aside for 7 working days and tested as needed. The Agency representative observes QC testing as needed.</p>
<p>2. Aggregate Percent Crushing (QC/QA, Verification*) <u>QC Testing</u> Testing rates as required by 2360.4E7 CAA, 2360.4E8 FAA. Two tests per day (CAA, FAA) for first two days. If CAA results exceed the specification minimum by 8% of the requirement; sample daily, test minimum one per week. If FAA results exceed the specification minimum by 5% of the requirement; sample daily, test minimum one per week. REMARKS: See Note #2, Note #3, & Note #4 <u>QA Testing</u> Companions to QC samples set aside for 7 working days and tested as needed. The Agency representative observes QC testing as needed.</p>
<p>3. Aggregate Quality Testing (QA Only) <u>QA Testing</u> When aggregate qualities approach specification limits or when material variation is observed, take additional field samples as requested by Project Engineer</p>
<p>4. Asphalt Binder Content, % (QC/QA, Verification) <u>QC Testing</u> 1 per 450 metric tons (500 tons) per mix blend for first 1,800 metric tons (2,000 tons) of mixture produced.</p> <p>(a) Meter Method (Virgin only) Mn/DOT Bituminous Manual (b) Incinerator Oven Mn/DOT Lab Manual Method 1853 (c) Chemical Extraction Mn/DOT Lab Manual Method 1851 or 1852 (d) Spot Check (Virgin only) Mn/DOT Bituminous Manual 5-693.848</p> <p>REMARKS: The verification companion sample must use Method (b) or (c) only. When more than one Mn/DOT approved test procedure is available, the Contractor shall select one method at the beginning of the project (when material is submitted for Trial Mix Review) and use that method for the entire project. The Contractor and Engineer may agree to change test procedures during the construction of the Project. REMARKS: See Note #2 & Note #3. If a member of a monitoring team observes the Contractor test, note and sign under remarks.</p> <p>The Project Engineer is responsible for:</p> <ol style="list-style-type: none"> 1.) Reviewing control charts & test summary sheets for accuracy and completeness. 2.) Checking, sampling and testing procedures. 3.) Discussing QC problem with Contractor. 4.) Obtaining verification samples. <p><u>QA Testing</u> Companions to QC samples set aside for 7 working days & tested as needed. The Agency representative observes QC testing as needed.</p>

SCHEDULE OF MATERIALS CONTROL

II. BITUMINOUS CONSTRUCTION ITEMS FOR SPECIFICATION 2360 (Note #1) (Part B, Cont'd)
(All bituminous mixtures are from Certified Plants)

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

5. Mixture Properties (QC/QA, Verification*)
 (Maximum Specific Gravity, Marshall Bulk Specific Gravity - 3 Specimen Average, Gyrotory Bulk Specific Gravity - 2 Specimen Average)

QC Testing

1 per 450 metric tons (500 tons) per mix blend for first 1,800 metric tons (2,000 tons) of mixture produced.
 Divide planned production by 1,000; round up to the next higher whole number determine testing rate.
 Verification Companion testing from Agency split sample is required to be performed and shall be used as a QC sample once per day.

REMARKS: See Note #2 & Note #3 Calibration factors shall be established regarding reheated samples.

QA Testing

Companion samples to QC samples set aside for 7 working days and tested as needed. The agency representative shall review QC operations on a daily basis. Review shall include but is not limited to monitoring QC summary sheets and comparing allowable tolerances for verification sample/verification companion sample test results. The Agency representative shall observe either 1 QC test per week (during production) or 1 QC test per 20,000 tons whichever results in more frequent observations.

*Verification Testing

Verification Companion testing from Agency split sample is required to be performed and shall be used as a QC sample once per day. Verification testing to include the following Mixture Properties: Maximum Specific Gravity, Marshall Bulk Specific Gravity - 3 Specimen Average or Gyrotory Bulk Specific Gravity - 2 Specimen Average, air voids, VMA, % crushing, asphalt binder content, and gradation. The verification companion shall also be tested for CAA and FAA at a rate of 1 test per week, if the CAA and FAA exceed the requirements by 8% and 5% respectively, otherwise test daily.

An Agency representative will take 1 verification sample per mixture blend per day for Mn/DOT laboratory testing. A verification companion sample will be given to contractor for QC testing.

6. Core Density and Thickness

QC Testing

Production/lot testing rate requirements.

Daily Production		Lots
Metric Ton	English (ton)	
270* – 545	(300* – 600)	1
546 – 910	(601 – 1000)	2
911 – 1455	(1001 – 1600)	3
1456 – 3275	(1601 – 3600)	4
3276 – 4545	(3601 – 5000)	5
4546 +	(5001 +)	6

*When mix production is less than 270 metric tons (300 tons), establish 1st lot when accumulative tonnage exceeds 270 metric tons (300 tons).

Core locations determined and marked by Agency. The Contractor shall schedule the approximate time of testing during normal project work hours so that the Agency may observe and record the saturated surface dry and immersed weight of the cores.

REMARKS: Sawing of cores into separate lifts is required. Contractor is required to have a saw capable of separating the core lifts without damaging the material.

QA Testing

1 companion core per lot. Core locations determined and marked by Agency. Agency representative observes all Contractor coring, sawing and testing, and takes possession of Mn/DOT cores after sawing. Agency cores shall be transported and tested at the Laboratory (Agency field or District/Division) as soon as possible to prevent damage due to improper handling or exposure to heat. A completed coring log shall be submitted to the Laboratory (Agency field or District/Division).

7. Aggregate Specific Gravity (QC/QA)

QC Sampling: 1 per 9,000 metric tons (10,000 tons). Tested by Contractor, if requested by Project Engineer.

QA Testing: Companion sample to QC sample shall be submitted to the District/Division Materials Lab and tested as needed.

SCHEDULE OF MATERIALS CONTROL

II. BITUMINOUS CONSTRUCTION ITEMS FOR SPECIFICATION 2360 (Note #1) (Part B, Cont'd)
(All bituminous mixtures are from Certified Plants)

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

8. Tensile Strength Ratio (T.S.R.) (QC/QA)

QC Sampling

1 in the first 5,000 tons or by the second day of production, whichever comes first, then 1 per 18,000 metric tons (20,000 tons). If the Materials Engineer requires the samples to be tested, both the Contractor and the Department will be required to test these samples within 72 hours after they are sampled.

QA Testing

Companion sample to QC sample shall be submitted to the District/Division Materials Lab and tested as needed.

9. BITUMINOUS MATERIALS

Only Bituminous Materials from Certified Sources are allowed for use. The most current list of Certified Sources can be found at <http://www.mrr.dot.state.mn.us/materials/apprprod.asp>

SAMPLE SIZE: 1 L (1 qt) for Asphalt Binder (QA)

2 L (1/2 gal) for Asphalt Emulsion (QA)

	Spec. No.	Quality Control (QC)	Quality Assurance (QA)	Form No.
Asphalt Binder	3151	QC testing is the responsibility of the bituminous material supplier. Random sampling is arranged by the Mn/DOT Chemical Laboratory.	State inspector observes contractor personnel taking sample. Sample first shipment of each grade of material at the start of a plant's production each year or after set-up of a portable plant. Thereafter, submit one sample per 1,000,000 liters (250,000 gal). Sample asphalt binder in clean one L (Qt) steel container.	2413 Asphalt Sample Identification Card
Asphalt Emulsion			Sample first shipment, then submit one sample per 200 m ³ ((50,000 gal.). Sample asphalt emulsion in clean two L (2 Qt.) plastic container with wide screw top and immediately send to Mn/DOT Chemical Lab.	
Cutback Asphalt			Cutback Asphalt should only be used in cold temperature applications with the Engineer's approval. Contact Bituminous Office for cold temperature application guidelines. Pressure fit cans for cutback asphalt.	

10. Moisture Content in Mixture (QC only)

QC Testing

Sampling and testing shall be conducted by the Contractor on a daily basis unless exempted by the Engineer and tested according to the procedures in the Bituminous Manual (5-693.950). Moisture contents above 0.3% are not allowed.

SCHEDULE OF MATERIALS CONTROL

II. BITUMINOUS CONSTRUCTION ITEMS FOR SPECIFICATION 2360 (Note #1) (Part B, Cont'd) (All bituminous mixtures are from Certified Plants)

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

NOTE #1. Projects with bituminous tonnage less than or equal to 272 metric tons (300 tons) per day may be accepted on a small quantity basis at the discretion of the Engineer. Retain Form 02415 or Form 2403 in Project File.

NOTE #2. All QA test samples shall be from split samples.

If a member of the monitoring team observes the Contractor Test, note and sign under remarks.

The Project Engineer is responsible for:

- 1.) Reviewing control charts & Test summary sheets for accuracy and completeness.
- 2.) Checking sampling and testing procedures.
- 3.) Discussing QC problems with the Contractor.
- 4.) Obtaining Verification Samples.
- 5.) When additional testing is necessary, collect QA samples which have been acquired and retained by the Contractor and/or additional verification samples.

NOTE #3. For process control testing, acceptance will be based on Contractor's test results as verified by Mn/DOT test results.

NOTE #4. Bituminous mixes composed entirely of Class A and/or Class B aggregates are not required to be tested for CAA (Coarse Aggregate Angularity).

NOTE #5. When the required sampling rate is one test per 500 tons, divide the bituminous mixture production planned for the day by 500, and round up to the next higher whole number; this will be the number of tests required for the day. When the required sampling rate is one test per 1000 tons, divide the bituminous mixture production planned for the day by 1000, and round up to the next higher whole number; this will be the number of tests required for the day. When the required sampling rate is one test per 2000 tons, divide the bituminous mixture production planned for the day by 2000, and round up to the next higher whole number; this will be the number of tests required for the day.

*Verification Testing

Verification Companion testing from Agency split sample is required to be performed and shall be used as a QC sample at least once per day. Verification testing to include the following Mixture Properties: Maximum Specific Gravity, Marshall Bulk Specific Gravity - 3 Specimen Average or Gyratory Bulk Specific Gravity - 2 Specimen Average, % crushing, asphalt binder content, and gradation. The verification companion shall also be tested for CAA and FAA at a rate of 1 test per week, if the CAA and FAA exceed the requirements by 8% and 5% respectively, otherwise test daily. An Agency representative will take 1 verification sample per mixture blend per day for Mn/DOT laboratory testing. A verification companion sample will be given to contractor for QC testing.

SCHEDULE OF MATERIALS CONTROL

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

III. Seal Coat Construction Items For 2356 SPECIAL PROVISIONS

A. (2356) Bituminous Seal Coat

B. (2356) Seal Coat - Macro-Surfacing

C. (2356) Micro-Surfacing

DEFINITIONS				
Sample Type	Description	Sample Location Determined By	Sample Taken By	Sample Tested By
	<i>Definitions from 23 CFR 637.203</i>			
QA Quality Assurance	All those planned and systematic actions necessary to provide confidence that a product or service will satisfy given requirements for quality			
QC Quality Control	All contractor/vendor operational techniques and activities that are performed or conducted to fulfill the contract requirements.	Contractor	Contractor	Contractor
Verification sampling and testing	Sampling and testing performed to validate the quality of the product.	Agency	Agency	Agency
	<i>Mn/DOT Definition</i>			
IAST	The Independent Assurance Sampling and Testing assures testers are sampling and testing properly and that equipment is calibrated correctly.	Agency	Contractor or Agency	Contractor or Agency

Should unique circumstances arise on a project which makes the quantities or rates of testing materials impractical, they may be revised prior to performing the work by contacting the Pavement Management Unit and obtaining their approval.

The testing rates shown are only minimums.

SCHEDULE OF MATERIALS CONTROL

III. Seal Coat Construction Items For 2356 SPECIAL PROVISIONS (cont'd)

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

(2356) BITUMINOUS SEAL COAT

SAMPLE SIZE:		Mix Design: 150 lbs.		
Test Type	Spec. No.	Quality Control (QC)	Verification	Form No.
Seal Coat Mix Design Gradation and Aggregate Qualities	2356	One per source Average gradation during production. % Shale Static Stripping Test Flakiness Index Los Angeles Rattler Aggregate design application rate Bit. Material design application rate Loose unit mass (weight) of the aggregate Bulk specific gravity of the aggregate	Verify all QC results and review mix design.	
Seal Coat Aggregate Stockpile Production Gradation Construction		Test for gradation. One per day, or one per 1360t (1500 tons), whichever is greater. If a temporary stockpile is used, test at this location. Sample for gradation. One per day. Test if required by the Engineer. All samples shall be taken from chip spreader hopper.	Test for gradation. One per day, or one per 1360t (1500 tons), whichever is greater. If a temporary stockpile is used, test at this location. Sample for gradation. One per day. Test if required by the Engineer. All samples shall be taken from chip spreader hopper.	
Bituminous Material For Seal Coat Quality Application rate For Fog Seal Quality Application rate		Use a Certified Source. Verify the application rate daily by dividing the volume used by the area covered. Use a certified source. Verify the application rate daily by dividing the volume used by the area covered.	Sample first shipment, then submit one sample per 200 m ³ (50,000 gal.). Sample asphalt emulsion in plastic container with wide screw top and immediately send to Mn/DOT Chemical Lab. One sample to test for dilution rate.	

SCHEDULE OF MATERIALS CONTROL

III. Seal Coat Construction Items For 2356 SPECIAL PROVISIONS (cont'd)

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

(2356) SEAL COAT – MACRO-SURFACING

SAMPLE SIZE:		Mix Design: 150 lbs.		
Test Type	Spec. No.	Quality Control (QC)	Verification	Form No.
Macro-surfacing Mix Design. Gradation and Aggregate Qualities Emulsion Tests on Base Asphalt Mix Design	2356	One per source Average gradation during production. Fractured faces Flakiness Index Micro-Deval Deleterious materials Absorption Sweep test Sieve test Viscosity Residue from Distillation Oil distillate by volume of emulsion Penetration Elastic recovery Aggregate design application rate Bit. Material design application rate Loose unit mass (weight) of the aggregate Bulk specific gravity of the aggregate Penetration results of emulsion	Verify aggregate properties. Sweep test is not verified by Mn/DOT Design is accepted by Mn/DOT	
Macro-surface Aggregate Stockpile Production Construction		Test for gradation. One per day, or one per 1360t (1500 tons), whichever is greater. If a temporary stockpile is used, test at this location. Sample for gradation. Two per day. Report results within two hours. All samples shall be taken from Macro Surfacing machine.	Sample for gradation. One per day.	
Bituminous material For Macro-surface Quality Application rate For Fog Seal Quality Application rate		Use a Certified Source. Verify the application rate daily by dividing the volume used by the area covered. Use a certified source. Verify the application rate daily by dividing the volume used by the area covered.	One sample to test for dilution rate.	

SCHEDULE OF MATERIALS CONTROL

III. Seal Coat Construction Items For 2356 SPECIAL PROVISIONS (cont'd)

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

(2356) SEAL COAT - MICRO-SURFACING

SAMPLE SIZE: Mix Design: 150 lbs.				
Test Type	Spec. No.	Quality Control (QC)	Verification	Form No.
Micro-surfacing Mix Design Gradation and Aggregate Qualities Asphalt Emulsion Certified source Mix Design	2356	One per source Average gradation during production. Sand Equivalent Abrasion Resistance Soundness Residue after Distillation Softening Point Penetration at 25C (77F) Absolute Viscosity at 60C (140F) Wet Stripping Wet Track Abrasion Loss - one hour soak - six day soak Saturated Abrasion Compatibility Mix Time at 25C (77F) Mix Time at 37.4C (100F)	Verify all QC results and review mix design. Review test results submitted in the mix design format required in the special provision.	
Micro-surfacing Aggregate Stockpile Production Construction		Test for gradation. One per day, or one per 1360t (1500 tons), whichever is greater. If a temporary stockpile is used, test at this location. Sample for gradation, sand equivalence and moisture content. One per 435.6 metric tons (500tons), minimum of one per day.	Test for gradation. One per 1360t (1500 tons), If a temporary stockpile is used, test at this location. Determine moisture content. One per day	
Asphalt Emulsion Quality Quantity For Fog Seal, when required Quality Application rate		Use a Certified Source. Verify the quantity using equipment counter readings. Use a certified source. Verify the application rate daily by dividing the volume used by the area covered.	Sample first shipment, then submit one sample per 200 m ³ (50,000 gal.). Sample asphalt emulsion in plastic container with wide screw top and immediately send to Mn/DOT Chemical Lab. One sample to test for dilution rate.	

SCHEDULE OF MATERIALS CONTROL

**IV. CONCRETE CONSTRUCTION ITEMS (www.mrr.dot.state.mn.us/pavement/concrete/concrete.asp)
(All Ready Mix is from Certified Plants)**

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

The testing rates shown in this Schedule of Materials Control are only minimums. Take as many tests as necessary to ensure quality concrete.

If any field test fails, reject the concrete or if the Producer makes adjustments to the load to meet requirements, record the adjustments on the Certificate of Compliance and the Weekly Concrete Report. Retest the load and record the adjusted test results. Make sure the next load is tested, before it gets into the work.

If batching adjustments are made at the plant, test the adjusted load, before it gets into the work. Continue to test the concrete if test results have been inconsistent.

If a gradation or quality test fails, the Producer cannot produce concrete until a passing test is completed. The Producer must have a passing gradation each day to prior to beginning production.

If failing concrete inadvertently gets placed in the work, either the Mn/DOT Standard Specifications for Construction or the Schedule of Price Reductions for Concrete address penalties.

It is recommended that the Agency representative continually monitor the progress of all concrete pours. (It is not an acceptable practice to only perform minimum testing requirements and leave the project.)

Should unique circumstances arise on a project which makes the rates of testing impractical, they may be revised prior to performing the work by contacting the Concrete Engineering Unit and obtaining their approval.

DEFINITIONS				
	Description	Sample Location Determined By	Sample Taken By	Sample Tested By
QC	Quality Control Testing performed by Contractor. Also known as Process Control Testing.	Contractor	Contractor	Contractor
QA	Quality Assurance Testing performed by the Agency. This test is performed on a companion sample to the Contractor's QC sample.	Contractor	Contractor	Agency
Verification	A sample to assure compliance of the Contractor's Quality Control program. The results shall be included as part of the QA Testing Program.	Agency	Agency	Agency
Verification Companion	A companion sample to the Agency's Verification sample provided to the Contractor. The Contractor is <u>required</u> to test this sample. The results shall be used as part of the QC program.	Agency	Agency	Contractor
IAST	The <u>I</u> ndependent <u>A</u> ssurance <u>S</u> ampling and <u>T</u> esting assures testers are sampling and testing properly and that equipment is calibrated correctly.	Agency	Contractor or Agency	Contractor or Agency

SCHEDULE OF MATERIALS CONTROL

IV. CONCRETE CONSTRUCTION ITEMS (Cont.)

(www.mrr.dot.state.mn.us/pavement/concrete/concrete.asp)

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

CERTIFIED READY-MIX CONCRETE

These testing rates shall be used for all concrete except paving concrete, low slump concrete overlays, and CPR.

Refer to Concrete Construction Materials Section to determine if any field samples need to be taken.

All QC and Verification gradation tests require companion samples. These samples are obtained from a larger sample that is reduced by splitting to obtain the sample sizes listed below for both the Producer/Contractor and the Agency. Samples taken at location identified on Contact Report located at plant.

Gradation Sample Size: 10 – 15 kg (25 lb.) for +19 mm (3/4" Plus) Coarse Aggregate
 5 – 7 kg (10-15 lb.) for –19 mm (3/4" Minus) Coarse Aggregate
 5 kg (10 lb.) for CA-70 and Sand

Quality Sample Size: 25 kg (50 lb.) Coarse Aggregate
 15 kg (30 lb.) Fine Aggregate

Moisture Sample Size: 500 g (1.1 lb.) Fine Aggregate
 2000 g (4.4 lb.) Coarse Aggregate

Test Type	Spec. No.	Producer/Contractor Testing	Agency Testing	Form No.
Gradation Testing (QC/QA) (5-694.145 and 5-694.148)	3126 3137	When over 20 m ³ (yd ³) of Agency concrete produced per day: Coarse: 1 per 100 m ³ (yd ³) Fine: 1 per 200 m ³ (yd ³) The Producer shall complete the initial aggregate gradations prior to the start of concrete production each day. The Producer may perform testing on representative material at the end of production the prior evening. The Producer is not required to wash the fine aggregate gradation (QC) sample, if the result on the -75µm (#200) sieve of the unwashed sample is less than 1.0%. The Producer is responsible for holding QA (QC companion) samples until they are picked up by the Agency monitor. If not picked up, they may be discarded after one week.	The QA (QC companion) samples are tested by the Agency at a rate directed by the Project Engineer. As a check on field testing equipment when QA testing is performed in the field, send one split gradation sample per month to District Laboratory for comparison testing.	2449 Weekly Concrete Aggregate Report (QC/QA)
Gradation Testing (Verification/ Verification Companion) (5-694.145 and 5-694.148)	3126 3137	The Producer is required to test the Verification Companion sample. Test to be completed during the day on which the sample was taken. The Producer must wash all fine aggregate Verification Companion samples.	Coarse and Fine: 1 per day or 1 per 500 m ³ (yd ³) whichever results in the lowest sampling rate with a minimum of 1 per week. A minimum of 2 Verification samples per week is required when Certified production is 3 or more days per week. Take more Verification samples when production problems exist.	2449 Weekly Concrete Aggregate Report 24143 Weekly Certified Ready-Mix Plant Report

SCHEDULE OF MATERIALS CONTROL

IV. CONCRETE CONSTRUCTION ITEMS (Cont.)

(www.mrr.dot.state.mn.us/pavement/concrete/concrete.asp)

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

CERTIFIED READY-MIX CONCRETE (Cont.)				
Test Type	Spec. No.	Producer/Contractor Testing	Agency Testing	Form No.
Moisture Testing (QC) (5-694.142)		When over 20 m ³ (yd ³) of Agency concrete produced per day: Coarse and Fine: 1 per 200 m ³ (yd ³) or every four hours, whichever results in the highest sampling rate. The Producer shall complete the initial moisture content and adjust the batch water prior to the start of concrete production each day. If weather conditions allow, the Producer may perform moisture testing on representative material at the end of production the prior evening.	None	2152 Concrete Batching Report
Quality Testing (Verification)	3126 3137	At Producer's/Contractor's Discretion	1 per month sampled for acceptance Testing may be adjusted by contacting the Concrete Engineering Unit. Quality testing will be performed as directed by the Concrete Engineer.	2410 Sample ID Card
Coarse Aggregate Testing on -75µm (#200) (Verification) (5-694.146)	3137	At Producer's/Contractor's Discretion	Testing rate for cleanliness of coarse aggregate as directed by the District Materials Engineer.	2410 Sample ID Card
Air Content (Verification) (5-694.541)	2461	None	Test first load each day per mix 1 per 100 m ³ (yd ³)	2448 Weekly Concrete Report
Slump (Verification) (5-694.531)	2461	None	Test first load each day per mix 1 per 100 m ³ (yd ³)	2448 Weekly Concrete Report
Compressive Strength (Verification) (5-694.511)	2461	None	1 per 100 m ³ (yd ³) Minimum of 1 per day if production is more than 20 m ³ (yd ³) Make additional control cylinders as necessary. Mn/DOT standard cylinder mold size is 100 x 200 mm (4 x 8inch). If aggregate has a maximum size greater the 31.5 mm (1-1/2 inch), use 150 x 300 mm (6 x 12 inch) molds.	2409 ID Card Concrete Test Cylinder

SCHEDULE OF MATERIALS CONTROL

IV. CONCRETE CONSTRUCTION ITEMS (Cont.)

(www.mrr.dot.state.mn.us/pavement/concrete/concrete.asp)

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

SMALL QUANTITIES		
<p>There are certain items of concrete that are acceptable under a modified small quantity acceptance plan from a known and reliable source. The Project Engineer should document small quantities on Form 2403 or 02415 and retain in project file. Agency testing is required at a minimum of 1 gradation verification test per week per plant. The Producer is required to test Verification Companion samples.</p>		
Test Type	Testing Requirements	Form No.
FIELD TESTING	1 air (if required), 1 slump and 1 cylinder test per day without plant testing per: 20 m ³ (yd ³) of general concrete work (pavement, curb and gutter, bridge footings, bridge concrete constructed above footings, median barrier, etc.) 100 m ³ (yd ³) of concrete of a non-critical nature (all Grade C concrete, Cast in Place pile fill, fencepost footings, etc.)	02415 or 2403 Inspection Report
PLANT TESTING	1 delivery truckload of concrete may be accepted without field tests if all plant tests are performed, including batching and mixing inspection.	02415 or 2403 Inspection Report

SCHEDULE OF MATERIALS CONTROL

IV. CONCRETE CONSTRUCTION ITEMS (Cont.)

(www.mrr.dot.state.mn.us/pavement/concrete/concrete.asp)

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

PAVING CONCRETE

See Special Provisions of Contract to see if these testing rates apply.

Definitions:

Contractor's Primary Concrete Paving Plant – This may be a central batch plant or a ready-mix plant that is dedicated to delivering concrete to a concrete paving project.

Large concrete paving projects - Those contracts generally having greater than 3825 m³ (5000 yd³) of concrete paving mixture.

Small concrete paving projects - Those contracts generally having equal to or less than 3825 m³ (5000 yd³) of concrete paving mixture.

Concrete Paving Specifications for Small Jobs shall use Certified Ready-Mix testing rates for gradations, moisture content, air content, slump, and compressive strength tests only. When work requires that a Certified Ready-Mix concrete plant be dedicated to a concrete paving project, a full-time Agency plant monitor, a full time Mn/DOT Plant Certified Producer representative and daily verification samples are recommended. Sampling and testing rates may be adjusted with the approval of the Concrete Engineering Unit.

Refer to Concrete Construction Materials Section to determine if any field samples need to be taken.

All Contractor gradation tests require companion samples. These samples are obtained from a larger sample that is reduced by splitting to obtain the sample sizes listed below for both the Contractor and the Agency.

Gradation Sample Size: 10 – 15 kg (25 lb.) for +19 mm (3/4" Plus) Coarse Aggregate
 5 – 7 kg (10-15 lb.) for –19 mm (3/4" Minus) Coarse Aggregate
 5 kg (10 lb.) for CA-70 and Sand

Quality Sample Size: 25 kg (50 lb.) Coarse Aggregate
 15 kg (30 lb.) Fine Aggregate

Moisture Sample Size: 500 g (1.1 lb.) Fine Aggregate
 2000 g (4.4 lb.) Coarse Aggregate

Test Type	Spec. No.	Contractor Testing	Agency Testing	Form No.
Gradation Testing (QC/QA) (5-694.145 and 5-694.148)	3126 3137	When over 250 m ³ (325 yd ³) is produced per day: 1 per 750 m ³ (1000 yd ³) or every four hours, whichever results in the highest sampling rate. Maximum of 5 per day Split all samples for Agency All sieve sizes specified in the Job Mix Formula (including fine sieves) will be required for the coarse gradations on the first day of production. The results of these tests shall be averaged on each sieve finer than the 9.5 mm [3/8 inch] for use in calculating the overall gradation.	1 per day Gradation is run on randomly selected Contractor split sample. Test the first 4 samples of production each time the Contractor mobilizes the plant or changes aggregate sources.	21764 Concrete Aggregate Worksheet JMF

SCHEDULE OF MATERIALS CONTROL

IV. CONCRETE CONSTRUCTION ITEMS (Cont.)

(www.mrr.dot.state.mn.us/pavement/concrete/concrete.asp)

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

PAVING CONCRETE (CONT.)				
Test Type	Spec. No.	Contractor Testing	Agency Testing	Form No.
Coarse Aggregate Testing on -75 µm (#200) (QC/QA) (5-694.146)	3137	Test the first 4 samples of production each time the Contractor mobilizes the plant or changes aggregate sources. If the Project Engineer determines that the cleanliness of the coarse aggregate has changed, the above procedure shall be repeated, otherwise, no additional fine sieve analysis on coarse aggregate shall be required.	Test the first 4 samples of production each time the Contractor mobilizes the plant or changes aggregate sources. If the Project Engineer determines that the cleanliness of the coarse aggregate has changed, the above procedure shall be repeated, otherwise, no additional fine sieve analysis on coarse aggregate shall be required.	21764 Concrete Aggregate Worksheet JMF
Aggregate Moisture Testing (Verification) (5-694.142)		None	1 per 750 m ³ (1000 yd ³) or every four hours, whichever results in the highest sampling rate. Maximum of 5 per day Take and test initial sample after approximately 1/2 hour of production each day. Initial samples for moisture and microwave testing should be taken after batch ticket water has stabilized indicating that the aggregate moisture has also stabilized.	2152 Concrete Batching Report
Total Moisture in Mixture (Verification) (5-694.532)		None	1 per 750 m ³ (1000 yd ³) or every four hours, whichever results in the highest sampling rate. Maximum of 5 per day Take and test initial sample after approximately 1/2 hour of production each day. Initial samples for moisture and microwave testing should be taken after batch ticket water has stabilized indicating that the aggregate moisture has also stabilized.	Microwave Oven Worksheet
Quality Testing (Verification)	3126 3137	At Contractor's discretion	Test each fraction 1 per month. See Special Provisions to determine if additional testing is required. Quality testing will be performed as directed by the Concrete Engineer.	2410 Sample ID Card
Air Content (QC/QA) (5-694.541)	2461	Test first load each day per mix 1 per 300 m ³ (300 yd ³)	1 air test per day minimum	2448 Weekly Concrete Report

SCHEDULE OF MATERIALS CONTROL

IV. CONCRETE CONSTRUCTION ITEMS (Cont.)

(www.mrr.dot.state.mn.us/pavement/concrete/concrete.asp)

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

PAVING CONCRETE (CONT.)				
Test Type	Spec. No.	Contractor Testing	Agency Testing	Form No.
Air Content (Verification) (5-694.541)	2461		1 set of air tests per day minimum (1 test before the paver and 1 test after the paver for correlation)	2448 Weekly Concrete Report
Slump (QC/QA) (5-694.531)	2461	1 slump test per day for slip form paving	1 slump test per day for slip form paving	2448 Weekly Concrete Report
Flexural Strength (5-694.521)	2301	1 set (2 beams) per 2000 m ³ (2500 yd ³) Make additional control beams as necessary If less than 2,000 m ³ (2,500 yd ³) of paving, a set of 2 cylinders per day may be substituted for the beam requirements. The Contractor fabricates beams, delivers beams to curing site, and cleans beam boxes.	Agency supplies beam boxes, cures, and tests beams.	2162 Concrete Test Beam Data
Thickness	2301	The Contractor drills concrete cores for thickness verification.	The cores are taken at locations determined by the Agency using random numbers. The Agency initials pavement at core locations and re-initials the sides of specimens after coring to clearly verify their authenticity.	24327 Field Core Report
Surface Smoothness Ride Quality	2301	Contractor provides Mn/DOT certified California Profilograph or Inertial Profiler Results.	If the Contractor's test results are in question, the Project Engineer may request that an Independent Source retest the entire project.	

SCHEDULE OF MATERIALS CONTROL

IV. CONCRETE CONSTRUCTION ITEMS (Cont.)

(www.mrr.dot.state.mn.us/pavement/concrete/concrete.asp)

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

LOW SLUMP CONCRETE FOR BRIDGE DECK OVERLAYS				
Refer to Concrete Construction Materials Section to determine if any field samples need to be taken.				
Gradation Sample Size: 10 – 15 kg (25 lb.) for +19 mm (3/4" Plus) Coarse Aggregate 5 – 7 kg (10-15 lb.) for -19 mm (3/4" Minus) Coarse Aggregate 5 kg (10 lb.) for CA-70 and Sand				
Quality Sample Size: 25 kg (50 lb.) Coarse Aggregate 15 kg (30 lb.) Fine Aggregate				
Test Type	Spec. No.	Contractor Testing	Agency Testing	Form No.
Gradation Testing (Verification) (5-694.145 and 5-694.148)	3126 3137	None	1 per fraction prior to commencing operations and each time aggregate is delivered to the site	21412 Weekly Report of "Low Slump Concrete"
Quality Testing (Verification)	3126 3137	None	As directed by the Project Engineer. Quality testing will be performed as directed by the Concrete Engineer.	
Air Content (Verification) (5-694.541)	2461	None	Test at beginning of pour each day. 1 per 15 m ³ (yd ³)	
Slump (Verification) (5-694.531)	2461	None	Test at beginning of pour each day. 1 per 15 m ³ (yd ³) For low-slump concrete from a concrete-mobile, allow mix to hydrate 4 to 5 minutes before slump test to assure all cement is saturated.	
Compressive Strength (Verification) (5-694.511)	2461	None	1 per 30 m ³ (yd ³) Minimum of 1 per project	

SCHEDULE OF MATERIALS CONTROL

IV. CONCRETE CONSTRUCTION ITEMS (Cont.)

(www.mrr.dot.state.mn.us/pavement/concrete/concrete.asp)

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

CONCRETE PAVEMENT REPAIR (CPR) FOR CONCRETE NOT SUPPLIED BY CERTIFIED READY-MIX				
Refer to Concrete Construction Materials Section to determine if any field samples need to be taken.				
Gradation Sample Size: 10 – 15 kg (25 lb.) for +19 mm (3/4" Plus) Coarse Aggregate 5 – 7 kg (10-15 lb.) for –19 mm (3/4" Minus) Coarse Aggregate 5 kg (10 lb.) for CA-70 and Sand				
Quality Sample Size: 25 kg (50 lb.) Coarse Aggregate 15 kg (30 lb.) Fine Aggregate				
Test Type	Spec. No.	Contractor Testing	Agency Testing	Form No.
Gradation Testing (Verification) (5-694.145 and 5-694.148)	3126 3137	None	1 per fraction prior to commencing operations and each time aggregate is delivered to the site	2448 Weekly Concrete Report
Quality Testing (Verification)	3126 3137	None	1 per fraction prior to commencing operations and each time aggregate is delivered to the site. Quality testing will be performed as directed by the Concrete Engineer.	
Air Content (Verification) (5-694.541)	2461	None	Test at beginning of pour each day. 1 per 15 m ³ (yd ³)	
Slump (Verification) (5-694.531)	2461	None	Test at beginning of pour each day. 1 per 15 m ³ (yd ³)	
Compressive Strength (Verification) (5-694.511)	2461	None	1 per 30 m ³ (yd ³) Minimum of 1 per project	2409 ID Card Concrete Test Cylinder

SCHEDULE OF MATERIALS CONTROL

IV. CONCRETE CONSTRUCTION ITEMS (Cont.)

(www.mrr.dot.state.mn.us/pavement/concrete/concrete.asp)

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

CONCRETE CONSTRUCTION MATERIALS					
Refer to Metallic Materials and Metal Products for sampling requirements for concrete reinforcement.					
CEMENTITIOUS MATERIALS					
All cementitious materials must come from certified sources. All certified sources must state so on the Bill of Lading. The most current approved list of certified sources can be found at www.mrr.dot.state.mn.us/pavement/concrete/products.asp					
Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Form No.
Standard Portland High Early Portland Air Entraining Portland Air Entraining High-Early Portland	3101		The Producer obtains and stores the sample in a sealed container provided by the Agency, and includes the supplier's bill-of-lading from which the sample is obtained.	2 kg (5 lb)	24300 ID Card Cement Samples
Portland Pozzolan Blended Cement Ground Granulated Blast Furnace Slag (GGBFS)	3102 3103		<u>For Concrete Pavement:</u> 1 sample per 7500 m ³ (10,000 yd ³) of concrete with a minimum of 1 per project	2 kg (5 lb)	24300 ID Card Cement Samples
Fly Ash	3115		<u>For Other Concrete:</u> 1 sample every 2 to 4 weeks per plant as production warrants <u>Take additional samples</u> as District Materials Engineer directs	2 kg (5 lb)	24308 ID Card Fly Ash Samples
ADMIXTURES FOR CONCRETE					
Only admixtures from approved sources are allowed for use. The most current lists of approved admixtures can be found at www.mrr.dot.state.mn.us/pavement/concrete/products.asp					
Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Form No.
Accelerating, Retarding, Water-Reducing, Air-Entraining, etc.	3113		<u>For Concrete Pavement:</u> 1 sample for each shipment for each type, brand, and concentration (Minimum of 1 per project) <u>For Other Concrete:</u> 1 sample once per month per plant or as production warrants	0.25 L (1/2 pt) Producer obtains samples from dispensing tubes Store samples in plastic container	2410 Sample ID Card
WATER					
Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Form No.
	3906	Visual Inspection	1 sample from any questionable source	3.5 L (1 gal) Store sample in a clean glass or plastic container	2410 Sample ID Card

SCHEDULE OF MATERIALS CONTROL

IV. CONCRETE CONSTRUCTION ITEMS (Cont.)

(www.mrr.dot.state.mn.us/pavement/concrete/concrete.asp)

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

CONCRETE CONSTRUCTION MATERIALS (CONT.)					
CURING MATERIALS					
Only curing materials from approved sources are allowed. The most current list of approved curing membrane compounds can be found at www.mrr.dot.state.mn.us/pavement/concrete/products/Approvedcuringcompounds.pdf					
Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Form No.
Burlap	3751	Visual Inspection		1 m ² (1 yd ²)	2410 Sample ID Card
Paper	3752	Visual Inspection Must be white opaque		0.25 m ² (2 ft ²)	2410 Sample ID Card
Plastic	3756	Visual Inspection Must be white opaque		0.25 m ² (2 ft ²)	2410 Sample ID Card
Membrane Compound	3754 3754AMS 3755		<p><u>For Concrete Pavement:</u> 1 sample for each shipment or if shipment contains more than 1 lot, sample each lot.</p> <p><u>For Other Concrete:</u> Call (651) 779-5556 before sampling</p>	1 L (1 qt) Materials must be thoroughly stirred or agitated immediately prior to taking sample. Store sample in steel container. Cover sample immediately.	2410 Sample ID Card
JOINT MATERIALS					
Only joint materials from approved sources are allowed for use. The most current list of approved hot pour sealants can be found at www.mrr.dot.state.mn.us/materials/AppProddisclaimer.asp . The most current list of approved silicone sealants can be found at www.mrr.dot.state.mn.us/pavement/concrete/jointsealants.pdf					
Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Form No.
Hot Poured Elastomeric Type	3723 3725		1 per lot	5 kg (10 lb) Take samples from application wand	2410 Sample ID Card
Silicone Joint Sealer	3722		1 per lot	0.5 L (1 pt) Store sample in steel container	2410 Sample ID Card
Preformed Elastomeric Type	3721	Visual Inspection	1 per lot	2 m (6 ft)	2410 Sample ID Card
Preformed	3702	Visual Inspection	1 per shipment of each type and thickness Will carry "Inspected" tag if approved prior to shipment.	0.25 m ² (2 ft ²)	2410 Sample ID Card

SCHEDULE OF MATERIALS CONTROL

IV. CONCRETE CONSTRUCTION ITEMS (Cont.)

(www.mrr.dot.state.mn.us/pavement/concrete/concrete.asp)

Please contact the Mn/DOT District Independent Assurance Inspector when project starts to provide servicing of your project.

CONCRETE CONSTRUCTION MATERIALS (CONT.)					
CONCRETE TREATING OIL					
Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Form No.
	3917	Visual Inspection	1 per project	0.5 L (1 pt) Store sample in steel container	2410 Sample ID Card
EPOXIES					
Only epoxies from approved sources are allowed for use. The most current lists of approved epoxies can be found at www.mrr.dot.state.mn.us/pavement/concrete/approvedepoxies.pdf					
Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Form No.
		Visual Inspection	1 sample of each component from each lot in each shipment for quantities over 1 gallon	0.25 L (1/2 pt) Store sample in steel container	2410 Sample ID Card

SCHEDULE OF MATERIALS CONTROL

V. LANDSCAPING AND EROSION CONTROL ITEMS

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
1. Plant Stock & Landscape Materials ^a	3861 and 2571.2A1	Field Inspection at Job Site, submit itemized report for each shipment. ^b	02415 or 2403		
<p>^a Preliminary inspection will not be done at the source. Material must be in accordance with the Inspection and Contract Administration Guidelines for Mn/DOT Landscape Projects.</p> <p>^b Utilize "Inspection and Contract Administration Guidelines for Mn/DOT Landscape Projects" to determine and measure minimum and maximum criteria thresholds. The following documentation must be provided as a condition for delivery and approval:</p> <ol style="list-style-type: none"> 1. A Mn/DOT Certificate of Compliance for Plant Stock, Landscape Materials, and Equipment 2. A valid copy of a nursery stock (dealer or grower) certificate registered with the MN. Dept. of Agriculture and/or a current nursery certificate/license from a state or provincial Dept. of Agriculture for each plant stock supplier. 3. A copy of the most recent Certificate of Nursery Inspection for each plant stock supplier. 4. Plant material shipped from out-of-state nursery vendors subject to quarantines (Gypsy Moth and Japanese Beetle) must be accompanied by documentation certifying all plants shipped are free of regulated pests. 5. Bills of lading (shipping documents) for all materials delivered. 6. Invoices (billing statements) for all materials to be used. 7. Each bundle, bale, or individual plant must be legibly and securely labeled with the name and size of each species or variety. 					
2. Fertilizer ^c	3881	Visual Inspection	None		
<p>^c BAGGED: Inspected on the basis of guaranteed analysis.</p> <p>BULK: Inspector to obtain copy of invoice of blended material stating analysis. Check if Slow Release Fertilizer is specified.</p>					
3. Agricultural Lime ^d	3879	One gradation test for each 180 Metric Ton (200 ton)	02415 or 2403	One sample per source for quantities of 90 metric ton (100 ton) or less	4.5 kg (10 lb.)
<p>^d Submit form 02415 or 2403. Small Quantity is 90 metric ton (100 ton) or less. Contractor must supply amount of ENP (Equivalent Neutralizing Power) for each shipment.</p>					
4. Topsoil Borrow, Select Topsoil Borrow, & Premium Topsoil Borrow ^e	3877.2	None		From each source: One composite sample for the first 765 m ³ (1,000 Cu Yd) or less. One composite sample for each additional 2,300 m ³ (3,000 Cu Yd) or fraction thereof.	10 kg (20 lb.)
<p>^e Testing takes about three weeks after delivery of the sample to the Department Laboratory. Sampling shall be done prior to the time the topsoil is delivered to the project. Check acceptance schedule Spec 2105 Table 2105-1. Small Quantity - 230 m³ (300 Cu Yd)</p>					

SCHEDULE OF MATERIALS CONTROL

V. LANDSCAPING AND EROSION CONTROL ITEMS (cont'd)

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
5. Mulch Material					
A. Type 3 Mulch - Certified Weed Free (Certified sources only) ^f	3882	Visual Inspection, Check if from Certified Vendor by Minnesota Crop Improvement Association. Must be tagged, grain straw only.			
^f Certified mulch will be indicated by label.					
B. Type 6 Mulch - Woodchips	3882	Visual Inspection, gradation 1/750 m ³ (1/1000 yd ³)		Gradation 1/3825 m ³ (1/5000 yd ³)	
6. Seeds					
A. Seeds (Certified Vendors Only) (Mixes 100-299) ^g	3876	Check for guaranteed analysis labels.	02415 or 2403	Sampling needs only to be done for seed that is not planted within nine months after germination test, or if quantity used is more than 1800 kg. (4,000 lb.)	0.5 L (1 pint)
^g Seed guaranteed as meeting the requirements is identified by official guaranteed analysis labels affixed to each container of seed in addition to the customary seed tag. Any moldy or insect contaminated seed must be rejected.					
B. Seeds (Non-Certified vendors) (Mixes 100-299) ^h	3876		02415 or 2403	MUST BE SAMPLED. For 25 bags or less, combine from five bags into one sample. For larger quantities; sample each 5th bag combine samples into groups of 5 and select a test sample from each composite.	0.5 L (1 pint)
^h Submit samples six weeks before seeding to allow for testing. Small Quantity - 90 kg (100 lb.)					
C. Native Seed (Mixes 300-399) certified seed only ⁱ	3876	Check if from Certified Vendor by Minnesota Crop Improvement Association, Must be tagged	None		
ⁱ Certified seed will be indicated by label on containers.					
7. Erosion Control Blanket ^j	3885	Visual Inspection	None	Random - See Footnote ^j	1 m ² (1 Sq Yd)
^j Periodic tests from approved sources to verify quality. Check approved products list					
8. Erosion Control Netting ^k	3883	Visual Inspection	None	Random - See Footnote ^k	1 m ² (1 Sq Yd)
^k Periodic tests from approved sources to verify quality. Check approved products list					

SCHEDULE OF MATERIALS CONTROL

V. LANDSCAPING AND EROSION CONTROL ITEMS (cont'd)

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
9. Peat Moss ¹	3880	Final Inspection at Job Site	None	For material furnished in bulk; one sample for 100 m ³ (100 Cu. Yd.) or less. An additional sample for each 200 m ³ or less, thereafter.	2-1/4 kg (5 lb.)
¹ Submit Samples in moisture proof bags. Materials furnished in packaged form may be accepted on the basis of guaranteed analysis.					
10. Sod ^m	3878	Final Visual Inspection at site.	None		
^m A Certificate of Compliance must be furnished by the producer to the Engineer for the type of sod supplied showing correct grass varieties.					
11. Silt Fence ⁿ	3886	Visual Inspection Check Product Label	02415 or 2403	For amounts 300m (1000 ft) or greater.	3 m (9 ft)
ⁿ Samples sent 21 days prior to use. Check Approved Products List of accepted geotextiles.					
12. Flotation Silt Curtain ^o	3887	Visual Inspection	None	Random - See Footnote ^o	1 m (1 Yd)
^o Accepted, based on manufacturers' guaranteed results. Check weight of fabric.					
13. Compost					
A. Compost Certified Source ^p	3890	Visual Inspection	None		12 kg (25 lb.)
^p Accepted on the basis of certified test reports furnished to the Engineer by the supplier. Periodic sampling to verify quality. Check approved source list.					
B. Compost Non-Certified Source ^q				Must be sampled - One Sample per 300 m ³ (500 Cu Yd)	
^q Submit samples six weeks before use. Small quantity 75 m ³ (100 Cu Yd) or less.					
14. Erosion Stabilization Mat ^r	3888	Visual Inspection	None	See Footnote ^r	1 m ² (1 Sq Yd)
^r Periodic tests from approved sources to verify quality. Check Approved Products List					
15. Sediment Mat ^s	3894	Visual Inspection	None	See Footnote ^s	1 m ² (1 Sq Yd)
^s Periodic tests from approved sources to verify quality.					
16. Fiber Log ^t	3895	Visual Inspection	None	See Footnote ^t	1 m ² (1 Sq Yd)
^t Periodic tests from approved sources to verify quality.					

SCHEDULE OF MATERIALS CONTROL

V. LANDSCAPING AND EROSION CONTROL ITEMS (cont'd)

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
17. Inlet Protection ^u	3891	Visual Inspection	None		
^u Periodic tests from approved sources to verify quality. Check approved products list and Specification.					
18. Hydraulic Soil Stabilizer ^v	3884	Slump Test for Type 8	None	None	
^v Periodic tests from approved sources to verify quality. Check approved products list.					
19. Filter Logs ^w	3897	Visual Inspection	None	None	
^w Periodic tests from approved sources to verify quality. Check approved products list.					
20. Flocculants ^x	3898	Visual Inspection	None	None	
^x Periodic tests from approved sources to verify quality. Check approved products list.					

SCHEDULE OF MATERIALS CONTROL

VI. CHEMICAL ITEMS

CALL CHEMICAL LABORATORY (651) 779-5548

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
1. Asphalt Plank	3204	Visual Inspection	2410 Sample ID Card	1 per 1,000 plank or less of each thickness in each shipment	3 – 1 linear m (yd) pieces samples from different planks
2. Calcium Chloride	3911	Visual Inspection	2410 Sample ID Card	Liquid: 1 per 40,000 L (1 per 10,000 gal)	0.5 L (1 pint)
Magnesium Chloride	3912			Dry: 1 per shipment	0.5 kg (1 lb.) in Plastic Container
3. Waterproofing Materials					
<p>Only waterproofing systems from approved sources are allowed for use. The most current list can be found at www.mrr.dot.state.mn.us/materials/AppProddisclaimer.asp.</p>					
A. Membrane Waterproofing System	3757	Visual Inspection	2410 Sample ID Card	1 per shipment (Membrane Only)	0.1 m ² (1 Sq Ft)
<p>Membrane Waterproofing System: The manufacturer shall submit a one square foot sample of the membrane along with a letter of Certification and test results stating that the membranes meet the requirements of this specification. Other components of the waterproofing system do not need to be sampled for testing. The manufacturer shall also submit detailed technical data sheets for all components of the membrane waterproofing system. Other components of the waterproofing system do not need to be sampled for testing.</p>					
B. Three Ply System	Three Ply System, containers will be stamped if approved prior to shipment. CALL CHEMICAL LABORATORY (651) 779-5548				
i. Asphalt Primer	3165	Visual Inspection	2410 Sample ID Card	1 per shipment	0.5 L (1 pt.) in steel container
ii. Waterproofing Asphalt	3166	Visual Inspection	2410 Sample ID Card	1 per shipment	0.5 L (1 pt.) in steel container
iii. Fabric	3201	Visual Inspection	2410 Sample ID Card	1 per shipment	1 m ² (1 Sq Yd)

SCHEDULE OF MATERIALS CONTROL

VI. CHEMICAL ITEMS (cont'd)

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
4. Paints					
A. Traffic Marking Paint	Only traffic marking paints from Qualified Products List are allowed for use.				
i. Waterborne Latex	3591	Visual Inspection	2410 Sample ID Card	1 per lot	0.5 L (1 pint)
ii. Epoxy Traffic Paint	3590	Visual Inspection	2410 Sample ID Card	1 Part A per lot 1 Catalyst Part B per lot	0.5 L (1 pint)
Waterborne Latex and Epoxy Traffic Paint: The most current Qualified Products List can be found at http://www.dot.state.mn.us/trafficeng/products/MnDOTapprovedproductlist.xls. Call Laboratory at (651) 779-5550 for pre-approved lots.					
iii. Other	Special Provisions	Visual Inspection	2410 Sample ID Card	1 Part A per lot 1 Catalyst Part B per lot	0.5 L (1 pint)
For traffic marking paints other than Waterborne Latex and Epoxy see Special Provision for Qualified Products List.					
B. Non-Traffic Striping Paints	3500 Series	Visual Inspection	02415	For pre-approved paints submit Form 02415 listing batch number. Call Chemical Laboratory for pre-approved lots	0.5 L (1 pint)
Only approved paints are allowed for use. For bridge coatings, see http://www.mrr.dot.state.mn.us/materials/3520_01APLweb4.pdf for the approved products list. For all others, see the Special Provisions. Send color sample to Chemical Laboratory for color matching.					
5. Drop-on Glass Beads	3592	Visual Inspection	2410	1 per lot	1 L (qt.)
Only glass beads from Qualified Products List are allowed for use. The most current Qualified Products List can be found at http://www.dot.state.mn.us/trafficeng/products/MnDOTapprovedproductlist.xls. Call Laboratory at (651) 779-5550 for pre-approved lots.					
6. Pavement Marking Tape	3353 3354 3355 Special Provisions	Visual Inspection	2410 Sample ID Card	1 clean sample of each color per lot	3 m (3 yds.)
Only pavement marking tape from Qualified Products List are allowed for use. The most current Qualified Products List can be found at http://www.dot.state.mn.us/trafficeng/products/MnDOTapprovedproductlist.xls.					
7. Signs and Markers	3352	Visual Inspection	02415	None unless material suspect	
Only SIGNS AND MARKERS from Qualified Products List are allowed for use. The most current Qualified Products List can be found at http://www.dot.state.mn.us/trafficeng/products/MnDOTapprovedproductlist.xls.					

SCHEDULE OF MATERIALS CONTROL

VII. METALLIC MATERIALS AND METAL PRODUCTS

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
1. Guard Rail					
A. Fittings - Splicers, Bolts, etc.	3381	Visual Inspection	02415 or 2403	Bolts: 2 Post bolts and 4 splice bolts with nuts for each 1,000 units or less.	
B. Cable	3381	Visual Inspection	Same	1 sample from each spool	1.2 m (4 ft)
C. Structural Plate Beam	3382	Visual Inspection	Same	One .025x.25 m (1inx10in) from one edge of one of each 200 RAIL SECTIONS or One of each 100 TERMINAL SECTIONS	
<p>REMARKS: Applicable to all Guardrail A, B, & C To be approved before use. Pre-tested or Inspected will carry "Inspected" tag. Not Pre-tested: Submit laboratory samples at required laboratory rate.</p> <p>For small quantities, lab samples not required, but document on Form 02415 or 2403 and maintain in project file. SMALL QUANTITIES: Rail Sections - 20 or less Terminals - 10 or less Post Bolts - 100 or less Splice Bolts - 100 or less</p>					
2. Steel Posts					
A. Sign Posts	3401	Visual Inspection	02415 or 2403	Two posts per shipment of each MASS per UNIT LENGTH	Submit shortest length of each weight
B. Fence Posts, Top Rails and others	3403* 3406* 3379*	Visual Inspection	Same	One sample per 500 pieces or less, but not less than two samples per shipment. Cut 0.3 m (1 ft) from each end of pipe. One each of fittings or hardware items.	
<p>REMARKS: * For 3403, 3406, & 3379 submit Certificate of Compliance and certified mill analysis with sample.</p>					
3. Fence Wire					
A. Barbed	3376*	Visual Inspection	02415 or 2403	One sample per 50 spools or fraction thereof	1 m (3 ft)
B. Woven	3376*	Visual Inspection	Same	One full height sample per 50 rolls	1 m (3 ft)
C. Chain Link Fabric	3376*	Visual Inspection	Same	One sample for each 1,500 m (5,000 ft) of fencing	0.3 m (1 ft)
<p>REMARKS: * For 3376, submit Certificate of Compliance and certified mill analysis with sample.</p>					

SCHEDULE OF MATERIALS CONTROL

VII. METALLIC MATERIALS AND METAL PRODUCTS (Cont'd)

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
4. Water Pipe and other Piping Materials	3364, 3365, 3366 & Special Provisions		02415 or 2403		
REMARKS: To be identified and tested if necessary <u>prior</u> to use. Retain Form 02415 or 2403 in project files. SEE SPECIAL PROVISIONS.					
5. Reinforcing Steel					
A. Bars					
i. Uncoated	3301	Visual Check for Size and Grade Marking	02415 or 2403	No Field Sample Necessary	
ii. Epoxy Coated	3301	Visual Check for Size and Grade Marking and "Inspected" tag (See Remarks)	Same	One sample (1 bar) of each size bar for each day's coating production	1 m (3 ft)
iii. Spirals	3305			One per shipment	1 m (3 ft)
REMARKS: For Uncoated bars - Retain Certificate of Compliance and Certified Mill Analysis in Project File. For Epoxy-Coated bars, steel will be tagged "Inspected" when it has been sampled and tested by Mn/DOT prior to shipment, and it will be tagged "Sampled" when testing has not been completed prior to shipment. If the Epoxy-Coated bars are not tagged "Sampled" or "Inspected", submit samples, Certificate of Compliance, and Certified Mill Analysis.					
B. Steel Fabric	3303	Visual Inspection		No Field Sample Necessary	
REMARKS: Retain Certificate of Compliance in project file.					
C. Dowel Bars	3302			One Dowel Bar from each shipment	Full Size Dowel Bars
REMARKS: For all types of dowels – Each project shall have a Certificate of Compliance from the Manufacturer certifying that all materials used in fabrication of the dowel bars and baskets comply with all applicable specifications. The Manufacturer shall maintain all records necessary for certification by project. The Certificate of Compliance shall be submitted to the Project Engineer.					
D. Prestressing Strand	3348			One sample (2 strands) from each heat	1.8 m (6 ft)
REMARKS: Submit one copy of mill certificate and one copy of the stress-strain curve representative of the lot with the samples.					
6. Drainage and Electrical Castings	3321 2471 2565	Visual Inspection*	02415 or 2403	ALL CASTINGS Two tensile bars to be cast with each heat at Foundry and submitted to the Laboratory by an approved Foundry*	
* Call Maplewood Laboratory at 651-779-5540 for list of approved foundries, or see website.					
REMARKS: Inspect in the field and retain Form 02415 or 2403 in project file, showing NAME OF FOUNDRY AND QUANTITY					

SCHEDULE OF MATERIALS CONTROL

VIII. MISCELLANEOUS MATERIALS

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
1. Timber, Lumber Piling & Posts	3412 to 3471 & 3491	Visual Inspection	02415 or 2403		
<p>REMARKS: Untreated materials shall be inspected in the field and the results reported on Form 02415 or 2403. Treated materials shall be Certified on the Invoice or Shipping Ticket. Material is inspected and stamped by an Independent Agency as per Specification 3491. Contact Laboratory for additional information.</p>					
2. Miscellaneous pieces and Hardware (Galvanized)	3392 3394		02415 or 2403	One sample of each item per shipment. Sample critical items only. (Critical items are load bearing, structurally necessary items.)	
<p>REMARKS: Will carry "Inspected" tag if sampled and tested prior to shipment. No sample necessary if "Inspected".</p>					
3. Insulation Board	3760	Visual Inspection	02415 or 2403	None	
4. Elastomeric Bearing Pads	3741 and Special Provisions	Check dimensions Check repair of tested pad		One sample, with one or more internal plates annually from each manufacturer.	Full size pad
<p>REMARKS: Submit copy of Certificate of Compliance with pad. <u>DO NOT</u> USE ANY PADS THAT ARE NOT CERTIFIED</p>					

SCHEDULE OF MATERIALS CONTROL

IX. GEOSYNTHETICS, PIPE, TILE, AND PRECAST/PRESTRESSED CONCRETE

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
1. Corrugated Metal Products					
A. Culvert Pipe Underdrains Erosion control Structures	3225 thru 3229, 3351, and 3399	Visual Inspection: Check for good construction, workmanship, finish requirements and shipping	02415 or 2403		
REMARKS: Make certain pipe is Certified on Invoice					
B. Structural Plate	3231	Visual Inspection: Invoice shall include notation that material described is in accordance with fabricator's Certificate and Guarantee	02415 or 2403		
C. Aluminum Structural Plate	3233				
REMARKS: The Fabricator's Certificate and Guarantee shall be on file in the Mn/DOT Central Laboratory.					
2. Clay Pipe	3251	No samples required for less than 100 pieces	02415 or 2403	1 sample per 200 pieces of each size.	Full Size Pipe
REMARKS: To be sampled and inspected in the field.					
3. Concrete Pipe					
A. Reinforced Pipe and Arches Precast Cattle Pass Units Sectional Manhole Units	3236	Field Inspection: Check for damage and defects. Check dimensions as required. Check for producer's "Certified" stamp and signature on the certification document.	2403 or 02415	1 "companion" cylinder per month per plant, or cylinder testing machine, whichever is greater. Call Precast Inspection Engineer at 651-779-5540 for additional information.	
B. Non-Reinforced Concrete Pipe	3253	Field Inspection: Check for damage and defects. Check dimensions as required. Check for producer's "Certified" stamp and signature on the certification document.	2403 or 02415	2 samples of each size from each source <u>unless inspected and stamped at source.</u>	Full Size Pipe
REMARKS: For Concrete Pipe Both A & B: Product will be certified by producer, only spot checks are done by plant inspector. Make certain the invoice or certification document is signed and the product has the required markings. Maintain Form 2403 or 02415 in project records, showing source of materials and type and quantity used					

SCHEDULE OF MATERIALS CONTROL

IX. GEOSYNTHETICS, PIPE, TILE, AND PRECAST/PRESTRESSED CONCRETE (Cont'd)

Kind of Material	Spec. No.	Tests by Producers	Form No.	Tests by Mn/DOT	Sample Size
4. Precast/Prestressed Concrete Structures					
A. Reinforced Precast Box Culvert	3238	1 Air test per day (1st load), 2 cylinders per pour for positive slump concrete (1 for handling, 1 for shipping).	02415 or 2403		
				1 "companion" cylinder per month per plant, or cylinder testing machine, whichever is greater. Call Precast Inspection Engineer at 651-779-5540 for additional information.	
	3126 Fine Aggregate			1 quality test per month.	
	3137 Coarse Aggregate			1 quality test per month.	
				Field Inspection: Check for plant inspector's stamp. Check for shipping damage or defects. Check dimensions as needed.	
B. Precast/Prestressed Concrete Structure (beams, posts, etc.).	2405 3126 (Fine Gradation: Aggregate)	1 gradation per 150 m ³ (200 Cu. Yd.) or fraction thereof. 1 per day of production or 3 per week, whichever is less.		1 gradation and 1 quality test per month from a split sample. Include producer's gradation results on sample card.	10 kg (25 lb.)
				1 "companion" cylinder per month per plant, or cylinder testing machine, whichever is greater. Call Precast Inspection Engineer at 651-779-5540 for additional information.	
		1 air test per day (1st load), 2 cylinders per pour for positive slump concrete (1 for handling, 1 for shipping).			
	3137 (Coarse Aggregate)	Gradation: 1 per 75 m ³ (100 Cu Yd) or fraction thereof. 1 per day of production or 3 per week, whichever is less.		3134 Coarse Aggregate 1 gradation and 1 quality test per month from a split sample. Include producer's gradation results on sample card.	10 kg (25 lb.)
				Field Inspection: Check for plant inspector's stamp. Check for shipping damage or defects. Check dimensions as needed.	
REMARKS: Precast/prestressed structures including boxes will be inspected and stamped at source. Only spot checks for dimensions are performed.					

SCHEDULE OF MATERIALS CONTROL

IX. GEOSYNTHETICS, PIPE, TILE, AND PRECAST/PRESTRESSED CONCRETE (Cont'd)

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
5. Manholes and Catch Basins (Construction)	2506 3622	Field Inspection: Check for damage and defects. Check dimensions as required. Check for Producer's "Certified" stamp and signature on the certification document.	02415 or 2403		
REMARKS: Product will be certified by producer or inspected, tested and stamped at source. Only spot checks are done by plant inspector. Make certain the invoice or certification document is signed and the product has the required markings. Maintain Form 2403 or 02415 in project records, showing source of materials and type and quantity used (bricks, blocks, precast, or combination).					
6. Drain Tile (Clay or Concrete)	3276	Visual Inspection		2 samples of each size from each source	
7. Thermoplastic (TP) Pipe ABS and PVC	3245	Obtain Certificate of compliance. Check for approved marking printed on pipe. Field Inspect for damage or defects.	02415 or 2403		
REMARKS: See Spec. 2345 for specific AASHTO or ASTM Pipe types are approved under this specification. If perforated, holes should be 5mm - 10 mm (3/16 - 3/8 inch) diameter, two rows for 4", and four rows for 6" diameter; approximately 75 mm (3 inches) on center.					
8. Corrugated Polyethylene Pipe	3278	Check for markings (AASHTO M 252) Certificate of Compliance. Field Inspect for damage or defects.	02415 or 2403	No Laboratory tests required	
9. Sewer Joint Sealing Compound	3724			One per shipment	0.5 L (1 pt.)
10. Preformed Plastic Sealer for Pipe	3726 Type b			One from each source	0.3 m (1 ft)
11. Bituminous Mastic Joint Sealer for Pipe	3728	Visual Inspection		Sample, if questionable	

SCHEDULE OF MATERIALS CONTROL

IX. GEOSYNTHETICS, PIPE, TILE, AND PRECAST/PRESTRESSED CONCRETE (Cont'd)

<p>12. Geotextile Fabric and Geogrid Reinforcement</p>	<p>3733 and Special Provisions</p>	<p>Inspect for damage and uniformity of texture. Rolls of both geotextile and geotextile wrapped PE Tubing must be wrapped in UV protective plastic. (Usually Black). Obtain Certificate of Compliance (see Note 1).</p>		<p>(a) 1 per 15,000 m (50,000 LF) or fraction thereof for pipe wrap or trench lining for Permeable base designs. (b) 1 per 8000 m² (10,000 sq. yd.) or fraction thereof of each type fabric or geogrid for all other uses. (see Note 2). (c) Sewn seam, if required, 1 per project minimum, additional as appropriate.</p>	<p>(a) 3m (10 LF) (b) 3m² (4SqYd)* (c) 3m (10 LF)</p>
<p>Note 1: Certificate of Compliance shall state material identification (e.g. Propex 2002, Miragrid 8XT), and minimum average roll values (MARV) for all specified geotextile properties. MARV values must meet the Specification 3733 Types 1 through VI requirements for the specific application. Submit copy of Certificate with material samples sent to the Materials Laboratory.</p>					
<p>Note 2: Submit additional sample(s), if the manufacturer or model of geotextile or geogrid used changes during construction. REMARKS: Sampling shall be by random selection and no more than one sample shall be taken from an individual roll. For type VI applications (including geogrids), submit pages of Special Provisions that list required material properties. (Type VI requirements are job specific.) For Modular Block Walls or Reinforced Soil Slopes, submit page(s) of shop drawings that reference geogrid/geotextile to be used (product name) and/or required properties. Contact Randy Tilseth, Geotechnical Section, 651-779-5604 for large quantity sampling rates (greater than 40,000 sq. yd. of material on project), small quantity testing, and questions.</p>					
<p>* Do not sample first 1 m (3 ft) of rolled Geotextile. Cut 1 m (3ft) wide strip across width of roll [Usually 3 - 4 m (12 - 14 ft)]</p>					
<p>13. Silt Fence</p>	<p>3886</p>	<p>Visual Inspection Check Product Label</p>	<p>02415 or 2403</p>	<p>For amounts 300 m (1000 ft) or greater.</p>	<p>3 m (9 ft)</p>
<p>REMARKS: Samples sent 21 days prior to use. Check Approved Products List of accepted geotextiles</p>					
<p>14. EPS Geofam</p>	<p>Special Provisions</p>	<p>Visual Inspection Check for yellow aged material, uniformity and dimensions. Weigh 1'x1'x1' cut coupon to verify density every 200 m³ (250 yd³)</p>	<p>02415 or 2403</p>		

SCHEDULE OF MATERIALS CONTROL

X. BRICK, STONE, AND MASONRY UNITS

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
1. Brick					
A. Sewer and Masonry	3612 to 3615	Visual Inspection		One sample per 50,000 brick or fraction thereof	6 whole brick
B. Concrete Sewer*	3616	Visual Inspection		One sample per 50,000 brick or fraction thereof	6 whole brick
* Air entrainment required. Obtain air content statement from supplier.					
2. Concrete Masonry Units					
A. For Sewer Construction	3621	Visual Inspection		One sample per shipment	6 whole units
Air entrainment required. Obtain air content statement from supplier.					
B. For Modular Block Retaining Walls	Special Provisions	Visual Inspection Check for cracks and broken corners		One sample per 10,000 units or fraction thereof, with a minimum of one sample per product (block) type per contract. *	5 whole units
All lots of block upon delivery shall have Manufacturer or Independent laboratory test results to verify passing both compression and freeze-thaw requirements. * Wall units and cap units are considered separate block types.					
3. Reinforced Concrete Cribbing	3661	Concrete control tests Air Tests Visual Inspection if previously tested	02415 or 2403	One cylinder per 100 units, but not less than 5 cylinders for a given contract. Other materials as required herein.	150x300mm (6 x 12 in) Cylinders
REMARKS: Will be stamped when inspected prior to shipment.					
4. Stone for Masonry or Rip-Rap	3601 and Special Provisions	Visual Inspection Submit Form 02415 unless special testing is specified	02415 or 2403		
REMARKS: Each source shall be approved by Project Engineer or Supervisor for quality prior to use. For questions on quality, contact District Materials or Geology Unit					

SCHEDULE OF MATERIALS CONTROL

XI. ELECTRICAL AND SIGNAL EQUIPMENT ITEMS

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
1. Lighting Standards (Aluminum or Steel)	3811	Visual Inspection			
REMARKS: The Fabricator will submit "Certificate of Compliance", on a per project basis, to the Structural Metals Engineer.					
2. Hand Holes and Pull Boxes (Precast) (PVC)	2545 2550 2565		02415 or 2403		
REMARKS: Will be inspected at source by laboratory upon notification. For cast iron frame and cover: see IX.6, Drainage Castings					
3. Foundation	2545	Slump as needed		1 cylinder per 20 m ³ (25 Cu. Yd.)	
4. Conduit and Fittings					
A. Metallic	3801 3802	Visual Inspection	02415 or 2403	None	
REMARKS: Conduit will bear UL labels. Retain Form 02415 or 2403 in Project File					
B. Non-Metallic	3803	Visual Inspection	02415 or 2403	Submit samples if not approved by brand	
REMARKS: Conduit will bear UL labels. Retain Form 02415 or 2403 in Project File					
5. Anchor bolts	3811.2B(5)	Visual Inspection		1 per 100 Units (per Type per Lot Number per Project)	
REMARKS: The Fabricator will submit test specimens (in quantities sufficient to meet the noted test frequency) to the Maplewood Lab. A copy of the test report will be forwarded to the Structural Metals Engineer.					
6. Miscellaneous Hardware		Visual Inspection		Sample critical items only. One of each item per shipment. (Critical Items are load bearing, structurally necessary items.)	
REMARKS: Will carry "Inspected tag if sampled and tested prior to shipment. No sample necessary if "Inspected". <u>Do Not</u> use if <u>not</u> tested. Field sample at sampling rate for laboratory testing.					

SCHEDULE OF MATERIALS CONTROL

XI. ELECTRICAL AND SIGNAL EQUIPMENT ITEMS (Cont'd)

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
7. Cable and Conductors					
A. Power Conductors Loop Detector Conductors (No Tubing)	3815.2B1 3815.2B2(a)	Visual Inspection	02415 or 2403	None	
REMARKS: Make certain the conductors are the type specified. Submit Field Inspection report showing type and quantities used. Shall bear UL label and type where applicable.					
B. Electrical Cables and Single Conductors with Jacket	3815.2B2(b) 3815.2B3 3815.2B4 3815.2C1 3815.2C3 3815.2C4 3815.2C5 3815.2C6 3815.2C7 3815.2C8	Visual Inspection	02415 or 2403	1 sample per size per lot	1.5m (5 ft)
REMARKS: Usually inspected at the distributor. Documentation showing project number, reel number(s), & Mn/DOT test number(s) will be included with each project shipment. If such documentation is not received from Contractor, submit sample for testing along with material certification from manufacturer. Pre-inspected materials will <u>not</u> be tagged; an inspection report will be sent by the Mn/DOT inspector for each shipment. Project inspectors should verify that the shipping documents agree with this inspection report. Call Steve Grover at 651-779-5540 or Cindy Schellack at 651-779-5543 with questions.					
C. Fiber Optic Cables	3815.2C13	Visual Inspection	02415 or 2403	1 sample per size per lot	1.5m (5 ft)
8. Ground Rods	2545 2565	Visual Inspection	02415 or 2403	None.	
REMARKS: Retain Form 02415 or 2403 in project file.					
9. Luminaires and Lamps	2545		02415 or 2403		
REMARKS: Approved by Brand Name and catalog number. The conductors shall bear UL label and type, where applicable.					
10. Electrical Systems					
Electrical Systems are to be reported as a "System" using the LIGHTING, SIGNAL AND TRAFFIC RECORDER INSPECTION REPORT. To be certified by the Project Engineer					
11. Traffic Signal Systems					
Traffic Signal Systems are to be reported as a "System" using the LIGHTING, SIGNAL AND TRAFFIC RECORDER INSPECTION REPORT. To be certified by the Project Engineer					