

**Minnesota Department of Transportation Office of Materials Schedule of Materials Control**

**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.

"If Forms 2415 and 2403 are referenced by form number within the Materials Control Schedule for materials or products received from pre-approved sources, where the field responsibility for acceptance is visual inspection and all information required to complete these forms is contained in other documents in the project file, the use of these forms becomes optional. If these forms are completed and sent to the Project Engineer by off-site inspection personnel from the district or the Office of Materials, they must be retained in the project file."

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.dot.state.mn.us/materials.html](http://www.dot.state.mn.us/materials.html)) 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.**

## SCHEDULE OF MATERIALS CONTROL

## INDEX

<b>Section</b>	<b>Page(s)</b>
<b>I. Grading and Base Construction Items</b>	<b>1 thru 4</b>
<b>II. Bituminous Construction Items for Specification 2360</b>	<b>5 thru 10</b>
<b>III. Sealcoat Construction Items for Specification 2356</b>	<b>11 thru 13</b>
<b>IV. Concrete Construction Items</b>	<b>14 thru 27</b>
<b>V. Landscaping and Erosion Control</b>	<b>28 thru 31</b>
<b>VI. Chemical Items</b>	<b>32 and 33</b>
<b>VII. Metallic Materials and Metal Products</b>	<b>34 and 36</b>
<b>VIII. Miscellaneous Materials</b>	<b>37</b>
<b>IX. Geosynthetics, Pipe, Tile, and Precast/Prestressed Concrete</b>	<b>38 thru 41</b>
<b>X. Brick, Stone, and Masonry Units</b>	<b>42</b>
<b>XI. Electrical and Signal Construction Items</b>	<b>43 and 44</b>

## SCHEDULE OF MATERIALS CONTROL

### TELEPHONE INDEX FOR SCHEDULE OF MATERIALS CONTROL

Section	Page	Section Name	Contact	Phone
Part I	Page 1	Grading & Base	Tim Andersen Cary Efta Rebecca Embacher	(651) 366-5455 (651) 366-5421 (651) 366-5525
Website: <a href="http://www.dot.state.mn.us/materials/gradingandbase.html">www.dot.state.mn.us/materials/gradingandbase.html</a>				
Part II Part II B 4	Page 5 Page 7	Bituminous - Spec. 2360 Asphalt Binder	John Garrity Jim McGraw Jason Szondy	(651) 366-5577 (651) 366-5548 (651) 366-5549
Website: <a href="http://www.dot.state.mn.us/materials/bituminous.html">www.dot.state.mn.us/materials/bituminous.html</a>				
Part III	Page 11	Seal Coating – Spec 2356	Erland Lukanen Jerry Geib	(651) 366-5460 (651) 366-5496
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) 366-5423 (651) 366-5423 (651) 366-5572 (651) 366-5575
Website: <a href="http://www.dot.state.mn.us/materials/concrete.html">www.dot.state.mn.us/materials/concrete.html</a>				
<b>Changed Title of Agricultural Items to Landscaping and Erosion Control Items</b>				
Part V	Page 28	Landscaping and Erosion Control Items Erosion Control Landscaping Wood Chips	Lori Belz Scott Bradley Paul Walvatne	(651) 366-3607 (651) 366-4612 (651) 366-3632
Part VI	Page 32	Chemical Items	Jim McGraw Dave Iverson	(651) 366-5548 (651) 366-5550
Part VII	Page 34	Metallic Materials and Metal Products Sampling Test Results Bridge Structural Metals	Terry Beaudry Laboratory Todd Niemann Barry Glassman	(651) 366-5456 (651) 366-5560 (651) 366-4567 (651) 366-4568
Part VIII	Page 36	Miscellaneous Materials Sections 1 thru 3 Section 4  Test Results	Terry Beaudry Todd Nieman Barry Glassman Laboratory	(651) 366-5456 (651) 366-4567 (651) 366-4568 (651) 366-5560
Part IX	Page 37	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) 366-5540 (651) 366-5456 (651) 366-5451 (651) 366-3607 (651) 366-5560
Part X	Page 41	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) 366-5456 (651) 366-5599 (651) 366-5540 (651) 366-5561
Part XI	Page 42	Electrical & Signal Sections 1, 8-11 Section 2 Section 3 Sections 4-7	Susan Zarling Steve Grover Wendy Garr Terry Beaudry	(651) 234-7052 (651) 366-5540 (651) 366-5423 (651) 366-5456

		Test Results	Laboratory	(651) 366-5560
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Mn/DOT SD - 15 March 27, 2008

Page iv

**SCHEDULE OF MATERIALS CONTROL**

**Form Index**

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

**SCHEDULE OF MATERIALS CONTROL**

**I. GRADING AND BASE CONSTRUCTION ITEMS** ([www.dot.state.mn.us/materials/gradingandbase.html](http://www.dot.state.mn.us/materials/gradingandbase.html))

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 5)	Minimum Required Contractor Quality Control Testing (QC Production Testing Rate)		Minimum Required Agency Acceptance Testing (Field Testing Rate)		Minimum Required Laboratory Testing (See Note 1)	Sample Size for Testing (See Note 6)	
			Metric	English	Metric	English		Metric	English
1. GRADATION (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	1/1,000 ton	< 500 t (See Note 2)	<500 tons (See Note 2)	1 per source  (Salvage Bit. See Note 3)	10-15 kg.	25 lb.
(d) Stabilizing Aggregate (2105)	3149 & Special Provisions		or  1/460 m <sup>3</sup> (CV)	or  1/550 yd <sup>3</sup> (CV)	500 t to <4,000 t	500 tons to <4,000 tons			
(e) Open Graded Aggregate Base (OGAB)	Special Provisions	02115-03, 24346-02, & 02402-03	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 <sup>3</sup> (CV) (See Note 2)	1/1,000 ton or 1/550 yd <sup>3</sup> (CV) (See Note 2)	1 per source	10-15 kg	25 lb.
(f) Granular Borrow Select Granular Borrow	3149 & Special Provisions		Less than 115,000 m <sup>3</sup> (CV) 1/8,000 m <sup>3</sup>  115,000 m <sup>3</sup> (CV) or more 1/15,000 m <sup>3</sup> (See Note 2)	Less than 150,000 yd <sup>3</sup> (CV) 1/10,000 yd <sup>3</sup>  150,000 yd <sup>3</sup> (CV) or more 1/20,000 yd <sup>3</sup> (See Note 2)	1 per source  (Salvage Bit. See Note 3)	10-15 kg	25 lb.		
(g) Full Depth Reclamation	Special Provision	02115-03 & -----	1/5,000 m <sup>2</sup>	1/6,000 yd <sup>2</sup>	1/10,000 m <sup>2</sup>	1/12,000 yd <sup>2</sup>	None	None	
(h) Granular Filter	3601 & Special Provisions	02115-03, 24346-02, & 02402-03	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 5)	Minimum Required Contractor Quality Control Testing (QC Production Testing Rate)		Minimum Required Agency Acceptance Testing (Field Testing Rate)		Minimum Required Laboratory Testing (See Note 1)	Sample Size for Testing (See Note 6)	
			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 & 02402-03	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) (a) Aggregate Base (b) Aggregate Shoulder  (c) Embankment Soil (Excavation & Borrow)	2211 2221 2105	24587-01	Contractor is encouraged to perform proctor tests for process control.		1/40,000 t or 1/18,000 m <sup>3</sup> (per source)	1/40,000 ton or 1/22,000 yd <sup>3</sup> (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) (a) Aggregate Base (b) Aggregate Shoulder  (c) Embankment Soil (Excavation & Borrow)	2211 2221 2105 & Special Provisions	02115-03 & 02140-03	Contractor is encouraged to perform density tests for process control.		1/1,800 t or 1/800 m <sup>3</sup> (CV)	1/1,800 ton or 1/1,000 yd <sup>3</sup> (CV)	None	None	None
4. Penetration Index Method (DCP) (a) Aggregate Base (b) Aggregate shoulders	2211 2221	02115-03 & 02170-02	Contractor is encouraged to perform DCP tests for process control.		2 DCP tests/ 1,800 t or 800 m <sup>3</sup> (CV)	2 DCP tests/ 1,800 ton or 1,000 yd <sup>3</sup> (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 5)	Minimum Required Contractor Quality Control Testing (QC Production Testing Rate)		Minimum Required Agency Acceptance Testing (Field Testing Rate)		Minimum Required Laboratory Testing (See Note 1)	Sample Size for Testing (See Note 6)	
			Metric	English	Metric	English		Metric	English
(Continued) 4. Penetration Index Method (DCP) (c) Full Depth Reclamation	Special Provisions	02115-03 & 02170-02	Contractor is encouraged to perform DCP tests for process control.		2 DCP tests/ 5,000 m <sup>2</sup>	2 DCP tests/ 6,000 yd <sup>2</sup>	None	None	
(d) Fine Filter Aggregate (Edge Drains)	2331 & Special Provisions	See Special Provisions							
5. Modified Penetration Index Method (DCP) (Special Provisions) (a) Aggregate Base (b) Aggregate Shoulder	2211 2221	02115-03 & Special Provisions	Contractor is encouraged to perform moisture tests for process control.		2 DCP tests/ 1,800 t or 800m <sup>3</sup> (CV)	2 DCP tests/ 1,800 ton or 1/1,000 yd <sup>3</sup> (CV)			
(c) Granular Borrow Select Granular Borrow	2105 & 3149				2 DCP tests/ 3,000 m <sup>3</sup> (CV)	2 DCP tests/ 4,000 yd <sup>3</sup> (CV)			
6. Relative Moisture (Required for Specified Density) (a) Aggregate Base (b) Aggregate Shoulder	2211 2221	02115-03 & 21850-02	Contractor is encouraged to perform moisture tests for process control.		1/1,800 t or 1/800m <sup>3</sup> or 10 tests whichever is less	1/1,800 ton or 1/1,000 yd <sup>3</sup> or 10 tests whichever is less			
(c) Embankment Soil (Excavation & Borrow)	2105				1/ 7,500 m <sup>3</sup> (CV)	1/ 10,000 yd <sup>3</sup> (CV)			
7. Moisture Content, (Dry Weight) (Required for Quality Compaction, Penetration Index Method, & Modified Penetration Method) (a) Aggregate Base (b) Aggregate Shoulder	2211 2221		Contractor is encouraged to perform moisture tests for process control.		1/1,800 t or 1/800m <sup>3</sup> or 10 tests whichever is less	1/1,800 ton or 1/1,000 yd <sup>3</sup> or 10 tests whichever is less			
(c) Full Depth Reclamation	Special Provisions				1/5,000 m <sup>2</sup>	1/6,000 yd <sup>2</sup>			

**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 5)	Minimum Required Contractor Quality Control Testing (QC Production Testing Rate)		Minimum Required Agency Acceptance Testing (Field Testing Rate)		Minimum Required Laboratory Testing (See Note 1)	Sample Size for Testing (See Note 6)	
			Metric	English	Metric	English		Metric	English
8. Percent Crushing (a) Belt Samples	3138, 3149, & Special Provisions	02463 & 24346-02	One Per Day (See Note #7)		None				
(b) Particle Count			None		One Per Source (See Note #7)				
9. 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 4)	25 lb. (See Note 4)

**NOTE 1:** Laboratory samples are not required for 1,000 metric ton [1,000ton] or less. Conversion Factors are listed in the Mn/DOT Grading & Base Manual under "Conversion Factors in Grading and Base Work".

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.

Field-lab tolerances are in the Mn/DOT Grading & Base Manual at:

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

The laboratory sample shall be twice the size used for testing (i.e. 25 lb. gradation test sample + 25 lb. companion sample = 50 lb. laboratory sample).

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

**NOTE 3:** Submit a laboratory companion to the first Acceptance Gradation sample for a bituminous extraction. Full Depth Reclamation samples are not required.

**NOTE 4:** Carbonate aggregate materials require 25-30 kg. (50 lbs.) for the lab.

**NOTE 5:** Forms are available on the Grading & Base website at:

[www.dot.state.mn.us/materials/gradingandbase.html](http://www.dot.state.mn.us/materials/gradingandbase.html)

**NOTE 6:** Sample size needed for each test performed. (i.e.; 25 lb Gradation Test Sample + 25 lb Companion Sample = 50 lb Field Sample).

**NOTE 7:** Percent crushing test will not 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.dot.state.mn.us/materialsbituminous.html](http://www.dot.state.mn.us/materialsbituminous.html))

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 Gyratory specimens for volumetric testing (Gyratory)

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 Gyratory specimens (option B) (Gyratory)

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> REMARKS: Mix Design for Spec. 2360 is Contractor's responsibility with review by Mn/DOT.</p> <p><u>QA Testing</u> For Marshall Design, Option 1- Laboratory Mix Design: In addition to reviewing the Trial Mix data (JMF), test Contractor's 3 Marshall specimens and uncompacted mixture (specimens and mixture submitted at optimum asphalt content). Also, evaluate TSR per 2360.3 B3. For option 2, Modified Mix Design, review Trial Mix data only.</p> <p>For Gyratory Design, Option 1- Laboratory Mix Design: In addition to reviewing the Trial Mix data (JMF), test Contractor's 2 Gyratory specimens and uncompacted mixture (specimens and mixture submitted at optimum asphalt content). Also, evaluate TSR per 2360.3 B3. For option 2, Modified Mix Design, review Trial Mix data only.</p>
<p>2. Aggregate Quality Testing (QA Only)</p> <p><u>QA Testing</u> 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. Contractor shall also submit the asphaltic aggregate material (RAP) when the mixture contains RAP. 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> 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> 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 m<sup>3</sup> (250,000 gal.) (approximately 1,000 ton).</p>

### 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 (½ gal) for Asphalt Emulsion (QA)

<p>1. Plant Mix Aggregate Gradation Testing (QC/QA, Verification*)</p> <p><u>QC Testing</u> 1 per 900 metric tons (1000 tons) at start of production, for the first 1,800 metric tons (2,000 tons) of mixture produced, then 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 &amp; Note #3. See Note #9 for Projects requiring the Adjusted AFT.</p> <p><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>
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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 (cont.)

Table with 2 columns: Item Number and Description. Item 2: Aggregate Percent Crushing (QC/QA, Verification\*). Item 3: Aggregate Quality Testing (QA Only). Item 4: Asphalt Binder Content, % (QC/QA, Verification). Includes sub-items (a) through (d) for testing methods and associated manuals.

**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.

**B. BITUMINOUS PRODUCTION for Specification 2360 (cont.)**

5. Mixture Properties (QC/QA, Verification\*)

Maximum Specific Gravity, Marshall Bulk Specific Gravity - 3 Specimen Average, Gyratory Bulk Specific Gravity - 2 Specimen Average, air voids, VMA, asphalt binder content, and gradation.

REMARKS: See Note #8 Asphalt Film Thickness (AFT)

QC Testing

1 per 450 metric tons (500 tons) per mix blend, at the start of production, for first 1,800 metric tons (2,000 tons) of mixture produced.

Determine planned tonnage for each mixture to be produced during the production day. Divide the planned production by 1,000; round up to the next higher whole number. This number will be the number of production tests required for that mixture.

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 10,000 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. 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 1<sup>st</sup> 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).

Remarks: See Note #6

7. Aggregate Specific Gravity (QC/QA)

QC Sampling: Sampled and tested by Contractor, if requested by District Materials Engineer.

QA Testing: Companion sample to QC sample shall be submitted to the District 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.

**B. BITUMINOUS PRODUCTION for Specification 2360 (cont.)**

8. Tensile Strength Ratio (T.S.R.) (QC/QA)  <u>QC Sampling</u> Sample as directed by the District Materials Engineer. If the District 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.  <u>QA Testing</u> When QC sampling is required, the 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 at <a href="http://www.dot.state.mn.us/products">http://www.dot.state.mn.us/products</a>  SAMPLE SIZE: 1 L (1 qt) for Asphalt Binder (QA)                      2 L (1/2 gal) for Asphalt Emulsion (QA)				
	<b>Spec. No.</b>	<b>Quality Control (QC)</b>	<b>Quality Assurance (QA)</b>	<b>Form No.</b>
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 <sup>3</sup> ((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 within 7 days of sampling.	
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 1 L (1qt.) cans for cutback asphalt.	
10. Moisture Content in Mixture (QC only) <u>QC Testing</u> 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.

**NOTE #6.** Most Mn/DOT projects in the 2008 Construction season will require 2 companion cores per lot be obtained for QA Testing. The Department will select at least one of the two companion cores per lot to be tested. However, the Department may elect to test all companions to provide a direct verification of all individual and daily average test results. 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).

**NOTE #7.** Traffic Level 4 or 5 mixtures that contain shingles will require a minimum of one spot check per day in addition to the required method (b) or (c) used for % total AC. The spot checks will be used for the determination of new added asphalt binder.

**NOTE #8.** Most Mn/DOT projects in the 2008 Construction season will require the calculated Adjusted Asphalt Film Thickness (AFT). VMA will still be calculated for informational purposes, but will not be used for acceptance criteria. The adjusted AFT shall be calculated each time a gradation test is required.

**NOTE #9.** One gradation per 900 metric tons (1000 tons) or portion thereof, of mixture produced with a minimum of one test per day.

**NOTE #10.** One asphalt binder determination per 900 metric tons (1000 tons) or portion thereof, of mixture produced with a minimum of one test per day.

### 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) Micro-Surfacing

<b>DEFINITIONS</b>				
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.

**A. (2356) BITUMINOUS SEAL COAT**

<b>SAMPLE SIZE:</b>		<b>Mix Design: 150 lbs.</b>		
<b>Test Type</b>	<b>Spec. No.</b>	<b>Quality Control (QC)</b>	<b>Verification</b>	<b>Form No.</b>
Seal Coat Mix Design	2356	One per source	Verify all QC results and review mix design.	
Gradation and Aggregate Qualities		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		
Seal Coat Aggregate		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.	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.	
Stockpile Production Gradation		Sample for gradation. One per day. Test if required by the Engineer. All samples shall be taken from chip spreader hopper.	Sample for gradation. One per day. Test if required by the Engineer. All samples shall be taken from chip spreader hopper.	
Construction				
Bituminous Material For Seal Coat		Use a Certified Source.	Sample first shipment, then submit one sample per 200 m <sup>3</sup> (50,000 gal.). Sample asphalt emulsion in plastic container with wide screw top and immediately send to Mn/DOT Chemical Lab.	
Quality		Verify the application rate daily by dividing the volume used by the area covered.		
Application rate		Use a certified source.		
For Fog Seal		Verify the application rate daily by dividing the volume used by the area covered.	One sample to test for dilution rate.	
Quality				
Application 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.

**B. (2356) SEAL COAT - MICRO-SURFACING**

<b>SAMPLE SIZE: Mix Design: 150 lbs.</b>				
<b>Test Type</b>	<b>Spec. No.</b>	<b>Quality Control (QC)</b>	<b>Verification</b>	<b>Form No.</b>
Micro-surfacing Mix Design	2356	One per source	Verify all QC results and review mix design.	
Gradation and Aggregate Qualities		Average gradation during production. Sand Equivalent Abrasion Resistance Soundness		
Asphalt Emulsion Certified source		Residue after Distillation Softening Point Penetration at 25C (77F) Absolute Viscosity at 60C (140F)	Review test results submitted in the mix design format required in the special provision.	
Mix Design		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)		
Micro-surfacing Aggregate				
Stockpile Production		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.		
Construction		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		Use a Certified Source.	Sample first shipment, then submit one sample per 200 m <sup>3</sup> (50,000 gal.). Sample asphalt emulsion in plastic container with wide screw top and immediately send to Mn/DOT Chemical Lab.	
Quantity		Verify the quantity using equipment counter readings.		
For Fog Seal, when required				
Quality		Use a certified source.	One sample to test for dilution rate.	
Application rate		Verify the application rate daily by dividing the volume used by the area covered.		

## SCHEDULE OF MATERIALS CONTROL

### IV. CONCRETE CONSTRUCTION ITEMS ([www.dot.state.mn.us/materials/concrete.html](http://www.dot.state.mn.us/materials/concrete.html)) (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 minimums. All samples shall be taken in a random manner using an appropriate number generator. Take as many tests as necessary to ensure quality concrete.
- It is recommended that the Agency Plant Monitor be present during critical pours, such as superstructure or paving concrete (ie. 3Y33, 3Y36, 3Y46, 3A21).
- 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 when test results are inconsistent or marginal.
- Material not meeting requirements shall not knowingly be placed in the work. 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 a recommended practice to only perform minimum testing requirements and leave the project.)
- Should circumstances arise on a project, which makes the testing rate impractical, contact the Concrete Engineering Unit.

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.dot.state.mn.us/materials/concrete.html)

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 are required.

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	<p>When over 20 m<sup>3</sup> (yd<sup>3</sup>) of Agency concrete produced per day:                      Coarse: 1 per 100 m<sup>3</sup> (yd<sup>3</sup>)                      Fine: 1 per 200 m<sup>3</sup> (yd<sup>3</sup>)</p> <p>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 the most recent day of production. <b>The Producer must have a passing gradation each day, prior to beginning production.</b></p> <p>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%.</p> <p>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.</p>	<p>The Agency is required to pick up all QA (QC companion) samples.</p> <p>The QA (QC companion) samples are tested by the Agency at a rate directed by the Project Engineer.</p> <p>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.</p>	2449 Weekly Concrete Aggregate Report (QC/QA)
Gradation Testing (Verification/ Verification Companion) (5-694.145 and 5-694.148)	3126 3137	<p>The Producer is required to test the Verification Companion sample. Test to be completed during the day on which the sample was taken.</p> <p>The Producer must wash all fine aggregate Verification Companion samples.</p>	<p>Coarse and Fine: 1 per day or 1 per 500 m<sup>3</sup> (yd<sup>3</sup>) whichever results in the lowest sampling rate with a minimum of 1 per week.</p> <p>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.</p>	2449 Weekly Concrete Aggregate Report  24143 Weekly Certified Ready-Mix Plant Report

## SCHEDULE OF MATERIALS CONTROL

IV. CONCRETE CONSTRUCTION ITEMS (Cont.) ([www.dot.state.mn.us/materials/concrete.html](http://www.dot.state.mn.us/materials/concrete.html))

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

<b>CERTIFIED READY-MIX CONCRETE (Cont.)</b>				
<b>Test Type</b>	<b>Spec. No.</b>	<b>Producer/Contractor Testing</b>	<b>Agency Testing</b>	<b>Form No.</b>
Moisture Testing (QC) (5-694.142)		<p>When over 20 m<sup>3</sup> (yd<sup>3</sup>) of Agency concrete produced per day:</p> <p>Coarse and Fine: 1 per 200 m<sup>3</sup> (yd<sup>3</sup>) or completed every four hours, whichever results in the highest sampling rate.</p> <p>The Producer shall complete the initial moisture content and adjust the batch water prior to the start of concrete production each day.</p> <p>If weather conditions allow, the Producer may perform moisture testing on representative material at the end of production the prior evening. In this event, the four-hour rate will commence with the first pour of the day, regardless if it is placed in Agency or private work.</p>	None	2152 Concrete Batching Report
Quality Testing (Verification)	3126 3137	At Producer's/Contractor's Discretion	<p>1 per month sampled for acceptance Testing may be adjusted by contacting the Concrete Engineering Unit.</p> <p>Quality testing will be performed as directed by the Concrete Engineer.</p>	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 Engineer.	2410 Sample ID Card
Air Content (Verification) (5-694.541)	2461	None	Test first load each day per mix 1 per 100 m <sup>3</sup> (yd <sup>3</sup> )	2448 Weekly Concrete Report
Slump (Verification) (5-694.531)	2461	None	Test first load each day per mix 1 per 100 m <sup>3</sup> (yd <sup>3</sup> ), except 1 slump test per day for slip form placement.	2448 Weekly Concrete Report

**SCHEDULE OF MATERIALS CONTROL**

**IV. CONCRETE CONSTRUCTION ITEMS (Cont.) (www.dot.state.mn.us/materials/concrete.html)**

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

<b>CERTIFIED READY-MIX CONCRETE (Cont.)</b>				
<b>Test Type</b>	<b>Spec. No.</b>	<b>Producer/Contractor Testing</b>	<b>Agency Testing</b>	<b>Form No.</b>
Compressive Strength (Verification) (5-694.511)	2461	None	<p>1 cylinder per 100 m<sup>3</sup> (yd<sup>3</sup>)                      Minimum of 1 per day if production is more than 20 m<sup>3</sup> (yd<sup>3</sup>)</p> <p>For concrete meeting specification 2521 and 2531 (curb and gutter and sidewalks):                      1 per day or 1 per 500 m<sup>3</sup> (yd<sup>3</sup>), whichever results in the lowest sampling rate with a minimum of one per week. A minimum of 2 cylinders per week is required, when production is 3 or more days per week.</p> <p>Make additional control cylinders as necessary.</p> <p>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 (1-1/4 inch), use 150 x 300 mm (6 x 12 inch) molds.</p>	2409 ID Card Concrete Test Cylinder

<b>SMALL QUANTITIES</b>		
<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>		
<b>Test Type</b>	<b>Testing Requirements</b>	<b>Form No.</b>
FIELD TESTING	<p>1 air (if required), 1 slump and 1 cylinder test per day without plant testing per:                      20 m<sup>3</sup> (yd<sup>3</sup>) of general concrete work (pavement, curb and gutter, bridge footings, bridge concrete constructed above footings, median barrier, etc.)</p> <p>100 m<sup>3</sup> (yd<sup>3</sup>) of concrete of a non-critical nature (all Grade C concrete, Cast in Place pile fill, fencepost footings, etc.)</p>	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.dot.state.mn.us/materials/concrete.html)**

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

**PAVING CONCRETE SUPPLIED BY A PAVING PLANT**

Refer to Special Provisions of Contract for project specific testing rates.

**Definitions:**

1. Paving Concrete shall be understood to include concrete mainline, ramps, loops, integrant curb, and curb and gutter placed adjacent to the concrete mainline with the same mixture as used in paving.
2. A concrete plant shall be understood to mean a paving plant, when concrete is hauled in dump or agitator trucks.

Refer to Concrete Construction Materials Section to determine if any field samples are required.

All samples for testing shall be taken in a random manner. All gradation samples shall be taken in the presence of the Agency, unless otherwise authorized by the Engineer. 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 200 m <sup>3</sup> (250 yd <sup>3</sup> ) is produced per day: 1 per 750 m <sup>3</sup> (1000 yd <sup>3</sup> ) or completed 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
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

## SCHEDULE OF MATERIALS CONTROL

IV. CONCRETE CONSTRUCTION ITEMS (Cont.) ([www.dot.state.mn.us/materials/concrete.html](http://www.dot.state.mn.us/materials/concrete.html))

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

PAVING CONCRETE SUPPLIED BY A PAVING PLANT (CONT.)				
Test Type	Spec. No.	Contractor Testing	Agency Testing	Form No.
Aggregate Moisture Testing (Verification) (5-694.142)		None	1 per 750 m <sup>3</sup> (1000 yd <sup>3</sup> ) or completed 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
Water Content Determination Test (Verification) (5-694.532)		None	1 per 750 m <sup>3</sup> (1000 yd <sup>3</sup> ) or completed 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 <sup>3</sup> (300 yd <sup>3</sup> )	1 air test per day minimum	2448 Weekly Concrete Report
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	Test first load each day per mix 1 per 300 m <sup>3</sup> (300 yd <sup>3</sup> ) except 1 slump test per day for slip form paving	1 slump test per day minimum	2448 Weekly Concrete Report

## SCHEDULE OF MATERIALS CONTROL

IV. CONCRETE CONSTRUCTION ITEMS (Cont.) ([www.dot.state.mn.us/materials/concrete.html](http://www.dot.state.mn.us/materials/concrete.html))

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

PAVING CONCRETE SUPPLIED BY A PAVING PLANT (CONT.)				
Test Type	Spec. No.	Contractor Testing	Agency Testing	Form No.
Flexural Strength (5-694.521)	2301	<p>1 beam (28-day) per day or 1 per 4000 m<sup>3</sup> (5000 yd<sup>3</sup>), whichever results in the lowest sampling rate with a minimum of 1 per week.</p> <p>A minimum of 2 beams per week is required, when production is 3 or more days per week.</p> <p>Make additional control beams as necessary</p> <p>The Contractor fabricates beams, delivers beams to curing site, and cleans beam boxes.</p>	Agency supplies beam boxes, cures, and tests beams.	2162 Concrete Test Beam Data
Thickness	2301	The Contractor drills concrete cores for thickness verification. In addition to coring, the Contractor may be required to probe the concrete at a rate specified in the Special Provisions of the contract.	Coring is performed 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 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.dot.state.mn.us/materials/concrete.html)**

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

**PAVING CONCRETE SUPPLIED BY A CERTIFIED READY-MIX PLANT**

Refer to the Special Provisions of Contract for project specific testing rates.

**Definitions:**

1. Paving concrete shall be understood to include concrete mainline, ramps, loops, integrant curb, and curb and gutter placed adjacent to the concrete mainline with the same mixture as used in the paving.
2. A concrete plant shall be understood to mean a ready-mix plant when concrete is hauled in revolving drum agitator trucks or transit-mix trucks.

Refer to Concrete Construction Materials Section to determine if any field samples are required.

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.

**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	<p>1 per 200 m<sup>3</sup> (250 yd<sup>3</sup>) or completed every four hours, whichever results in the highest sampling rate.</p> <p>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 the most recent day of production. <b>The Producer must have a passing gradation each day prior to beginning production.</b></p> <p>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%.</p> <p>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.</p>	<p>The Agency is required to pick up all QA (QC companion) samples.</p> <p>The QA (QC companion) samples are tested by the Agency at a rate directed by the Project Engineer.</p> <p>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.</p>	21764 Concrete Aggregate Worksheet JMF

## SCHEDULE OF MATERIALS CONTROL

IV. CONCRETE CONSTRUCTION ITEMS (Cont.) ([www.dot.state.mn.us/materials/concrete.html](http://www.dot.state.mn.us/materials/concrete.html))

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

PAVING CONCRETE SUPPLIED BY A CERTIFIED READY-MIX PLANT (CONT.)				
Test Type	Spec. No.	Producer/Contractor Testing	Agency Testing	Form No.
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 <sup>3</sup> (yd <sup>3</sup> ) 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
Moisture Testing (QC) (5-694.142)		1 per 200 m <sup>3</sup> (250 yd <sup>3</sup> ) or completed every four hours, whichever results in the highest sampling rate.	None	2152 Concrete Batching Report
Quality Testing (Verification)	3126 3137	At Producer's/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
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 Engineer.	2410 Sample ID Card
Air Content (QC/QA) (5-694.541)	2461	None	Test first load each day per mix 1 per 200 m <sup>3</sup> (250 yd <sup>3</sup> )  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	None	Test first load each day per mix 1 per 200 m <sup>3</sup> (250 yd <sup>3</sup> ) except 1 slump test per day for slip form paving	2448 Weekly Concrete Report
Flexural/ Compressive Strength (5-694.521 and 5-694.511)	2301	None	1 beam/cylinder (28-day) per day  Make additional control specimens as necessary	2162 Concrete Test Beam Data
Thickness	2301	The Contractor drills concrete cores for thickness verification. In addition to coring, the Contractor may be required to probe the concrete at a rate specified in the Special Provisions of the contract.	Coring is performed 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 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.dot.state.mn.us/materials/concrete.html)**

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

<b>LOW SLUMP CONCRETE FOR BRIDGE DECK OVERLAYS</b>				
Refer to Concrete Construction Materials Section to determine if any field samples are required.				
<b>Gradation Sample Size:</b> 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				
<b>Quality Sample Size:</b> 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 <sup>3</sup> (yd <sup>3</sup> )	
Slump (Verification) (5-694.531)	2461	None	Test at beginning of pour each day. 1 per 15 m <sup>3</sup> (yd <sup>3</sup> )  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 cylinder per 30 m <sup>3</sup> (yd <sup>3</sup> ) Minimum of 1 per project	2409 ID Card Concrete Test Cylinder

## SCHEDULE OF MATERIALS CONTROL

IV. CONCRETE CONSTRUCTION ITEMS (Cont.) ([www.dot.state.mn.us/materials/concrete.html](http://www.dot.state.mn.us/materials/concrete.html))

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 are required.

**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 and 3U18 bag mix.

**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.  When Bagged Portland Cement Concrete Patching Mix Grade 3U18 is supplied (any size bags) to the project, the dry blended mixture shall be sampled from the Contractor's field batching apparatus. The minimum sampling rate shall be 1 sample per shipment.  The samples shall be submitted to the Central Laboratory for testing. The samples shall be wet-washed through the 75µm (#200) sieve to remove the portland cement and the aggregate retained on the 75µm (#200) sieve shall be dried prior to performing gradation testing to verify compliance with 3105.2B.	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 <sup>3</sup> (yd <sup>3</sup> )	
Slump (Verification) (5-694.531)	2461	None	Test at beginning of pour each day. 1 per 15 m <sup>3</sup> (yd <sup>3</sup> )	
Compressive Strength (Verification) (5-694.511)	2461	None	1 cylinder per 30 m <sup>3</sup> (yd <sup>3</sup> ) Minimum of 1 per project	2409 ID Card Concrete Test Cylinder

## SCHEDULE OF MATERIALS CONTROL

IV. CONCRETE CONSTRUCTION ITEMS (Cont.) ([www.dot.state.mn.us/materials/concrete.html](http://www.dot.state.mn.us/materials/concrete.html))

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

<b>DOWEL BAR RETROFIT MATERIAL</b>				
Test Type	Spec. No.	Contractor Testing	Agency Testing	Form No.
Compressive Strength (Verification) (5-694.511)	2461	None	<p>During the test operations: 1 set of 3 cylinders tested at 3 hours 1 set of 3 cylinders tested at 1 day Testing may need to be repeated if any problems with the dowel bar retrofit material are encountered.</p> <p>First day of production: 1 set of 3 cylinders tested at 3 hours 1 set of 3 cylinders tested at 1 day</p> <p>After the first day of production: 1 cylinder per day during production tested at rate determined by Engineer.</p>	2409 ID Card Concrete Test Cylinder

<b>CONTROLLED LOW STRENGTH MATERIAL (CLSM) OR CELLULAR CONCRETE</b>				
Test Type	Spec. No.	Contractor Testing	Agency Testing	Form No.
Compressive Strength (Verification) (5-694.511)	2461 2519	None	<p>1 set of 4 cylinders per day Minimum of 1 set of 4 per project</p> <p>4 x 8 cylinders shall be filled in two equal lifts, do not rod the concrete, lightly tap the sides, cover and move to area with minimal or no vibration. Do not disturb for 24 hours.</p>	2409 ID Card Concrete Test Cylinder

## SCHEDULE OF MATERIALS CONTROL

IV. CONCRETE CONSTRUCTION ITEMS (Cont.) ([www.dot.state.mn.us/materials/concrete.html](http://www.dot.state.mn.us/materials/concrete.html))

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

<b>CONCRETE CONSTRUCTION MATERIALS</b>					
Refer to Metallic Materials and Metal Products for sampling requirements for concrete reinforcement.					
<b>CEMENTITIOUS MATERIALS</b>					
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 <a href="http://www.dot.state.mn.us/products">www.dot.state.mn.us/products</a>					
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		Sample once per project or once every 3 months, whichever is less.	2 kg (5 lb)	24300 ID Card Cement Samples
Fly Ash	3115		<u>Take additional samples</u> as Concrete Engineer directs	2 kg (5 lb)	24308 ID Card Fly Ash Samples
<b>ADMIXTURES FOR CONCRETE</b>					
Only admixtures from approved sources are allowed for use. The most current lists of approved admixtures can be found at <a href="http://www.dot.state.mn.us/products">www.dot.state.mn.us/products</a>					
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
<b>WATER</b>					
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.dot.state.mn.us/materials/concrete.html](http://www.dot.state.mn.us/materials/concrete.html))

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

<b>CONCRETE CONSTRUCTION MATERIALS (CONT.)</b>					
<b>CURING MATERIALS</b>					
Only curing materials from approved sources are allowed. The most current list of approved curing membrane compounds can be found at <a href="http://www.dot.state.mn.us/products">www.dot.state.mn.us/products</a>					
<b>Material</b>	<b>Spec. No.</b>	<b>Minimum Required Acceptance Testing (Field Testing Rate)</b>	<b>Minimum Required Sampling Rate for Laboratory Testing</b>	<b>Sample Size</b>	<b>Form No.</b>
Burlap	3751	Visual Inspection		1 m <sup>2</sup> (1 yd <sup>2</sup> )	2410 Sample ID Card
Paper	3752	Visual Inspection Must be white opaque		0.25 m <sup>2</sup> (2 ft <sup>2</sup> )	2410 Sample ID Card
Plastic	3756	Visual Inspection Must be white opaque  A Certificate of Compliance shall be submitted to the Project Engineer from the Manufacturer certifying that the plastic complies with AASHTO M171.		0.25 m <sup>2</sup> (2 ft <sup>2</sup> )	2410 Sample ID Card
Membrane Compound	3754 3754AMS 3755		Refer to the approved products list of curing compounds for pretested lots or call (651) 366-5556 before applying.	1 liter (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
<b>JOINT MATERIALS</b>					
Only joint materials from approved sources are allowed for use. The most current list of approved hot pour & silicone sealants can be found at <a href="http://www.dot.state.mn.us/products">www.dot.state.mn.us/products</a>					
<b>Material</b>	<b>Spec. No.</b>	<b>Minimum Required Acceptance Testing (Field Testing Rate)</b>	<b>Minimum Required Sampling Rate for Laboratory Testing</b>	<b>Sample Size</b>	<b>Form No.</b>
Hot Poured Elastomeric Type	3719 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 liter (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		0.25 m <sup>2</sup> (2 ft <sup>2</sup> )	2410 Sample ID Card

## SCHEDULE OF MATERIALS CONTROL

## V. LANDSCAPING AND EROSION CONTROL ITEMS

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

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 <sup>a</sup>	3861 and 2571.2A1	Field Inspection at Job Site, submit itemized report for each shipment. <sup>b</sup>			
<p><sup>a</sup> 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><sup>b</sup> 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"> <li>1. A Mn/DOT Certificate of Compliance for Plant Stock, Landscape Materials, and Equipment</li> <li>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.</li> <li>3. A copy of the most recent Certificate of Nursery Inspection for each plant stock supplier.</li> <li>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.</li> <li>5. Bills of lading (shipping documents) for all materials delivered.</li> <li>6. Invoices (billing statements) for all materials to be used.</li> <li>7. Each bundle, bale, or individual plant must be legibly and securely labeled with the name and size of each species or variety.</li> </ol>					
2. Fertilizer <sup>c</sup>	3881	Visual Inspection	None		
<p><sup>c</sup> BAGGED: Inspected on the basis of guaranteed analysis. Rate based on fertility analysis of slope dressing/topsoil. BULK: Inspector to obtain copy of invoice of blended material stating analysis. Check the type specified.</p>					
3. Agricultural Lime <sup>d</sup>	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><sup>d</sup> 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 <sup>e</sup> Salvaged Topsoil (stockpiled)	3877.2	None		From each source: One composite sample for the first 765 m <sup>3</sup> (1,000 Cu yd) or less. One composite sample for each additional 2,300 m <sup>3</sup> (3,000 Cu yd) or fraction thereof.	10 kg (20 lb.)
<p><sup>e</sup> Testing takes about three weeks after delivery of the sample to the Department Laboratory. Sampling shall be done once source is identified or existing topsoil is stockpiled. Check acceptance schedule Spec 2105 Table 2105-1. Small Quantity - 230 m<sup>3</sup> (300 Cu yd)</p>					



## SCHEDULE OF MATERIALS CONTROL

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

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

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
<b>5. Mulch Material</b>					
A. Type 3 Mulch - Certified Weed Free (Certified sources only) <sup>f</sup>	3882	Visual Inspection, Check if from Certified Vendor by Minnesota Crop Improvement Association. Must be tagged, grain straw only.			
<sup>f</sup> Certified mulch will be indicated by label.					
B. Type 6 Mulch - Woodchips	3882	Visual Inspection, gradation 1/750 m <sup>3</sup> (1/1000 yd <sup>3</sup> ) per supplier.		Gradation 1/3825 m <sup>3</sup> (1/5000 yd <sup>3</sup> ) per supplier.	
<b>6. Seeds</b>					
A. Seeds (Certified Vendors Only) (Mixes 100-299) <sup>g</sup>	3876	Check for guaranteed analysis labels. If materials are on hand and past the nine months, testing must be done.		Sampling only, if quantity used is more than 1800 kg. (4,000 lb.) Send to Brett Troyer M.S. 620	0.5 L (1 pint)
<sup>g</sup> 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. Native Seed (Mixes 300-399) certified seed only <sup>h</sup>	3876	Check if from Certified Vendor by Minnesota Crop Improvement Association, Must be tagged. If materials are on hand and past the nine months, testing must be done.	None	Sample only if quantity used is more than 1800 kg. (4,000 lb.) Send to: Brett Troyer M.S 620	
<sup>h</sup> Certified seed will be indicated by label on containers.					
<b>7. Erosion Control Blanket</b> <sup>i</sup>	3885	Visual Inspection	None	Random - See Footnote <sup>i</sup>	1 m <sup>2</sup> (1 Sq yd)
<sup>i</sup> Periodic tests from approved sources to verify quality. Check approved products list					
<b>8. Erosion Control Netting</b> <sup>j</sup>	3883	Visual Inspection	None	Random - See Footnote <sup>j</sup>	1 m <sup>2</sup> (1 Sq yd)
<sup>j</sup> Periodic tests from approved sources to verify quality. Check approved products list					
<b>9. Peat Moss</b> <sup>k</sup>	3880	Final Inspection at Job Site	None	For material furnished in bulk; one sample for 100 m <sup>3</sup> (100 Cu. yd.) or less. An additional sample for each 200 m <sup>3</sup> or less, thereafter.	2-1/4 kg (5 lb.)
<sup>k</sup> Submit Samples in moisture proof bags. Materials furnished in packaged form may be accepted on the basis of guaranteed analysis.					
<b>10. Sod</b> <sup>l</sup>	3878	Final Visual Inspection at site.	None		
<sup>l</sup> A Certificate of Compliance must be furnished by the producer to the Engineer for the type of sod supplied showing correct grass varieties.					

## SCHEDULE OF MATERIALS CONTROL

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

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

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
11. Silt Fence <sup>m</sup>	3886	Visual Inspection Check Product Label		For amounts 300m (1000 ft) or greater.	3 m (9 ft)
<sup>m</sup> Samples sent 21 days prior to use. Check Approved Products List of accepted geotextiles.					
12. Flotation Silt Curtain <sup>n</sup>	3887	Visual Inspection	None	Random - See Footnote <sup>n</sup>	1 m (1 yd)
<sup>n</sup> Accepted, based on manufacturers' guaranteed results. Check weight of fabric.					
13. Compost					
A. Compost Certified Source <sup>o</sup>	3890	Visual Inspection	None		12 kg (25 lb.)
<sup>o</sup> 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 <sup>p</sup>				Must be sampled - One Sample per 300 m <sup>3</sup> (500 Cu Yd)	
<sup>p</sup> Submit samples six weeks before use. Small quantity 75 m <sup>3</sup> (100 Cu Yd) or less.					
14. Erosion Stabilization Mat <sup>q</sup>	3888	Visual Inspection	None	See Footnote <sup>q</sup>	1 m <sup>2</sup> (1 Sq yd)
<sup>q</sup> Periodic tests from approved sources to verify quality. Check Approved Products List					
15. Sediment Mat <sup>r</sup>	3894	Visual Inspection	None	See Footnote <sup>r</sup>	1 m <sup>2</sup> (1 Sq yd)
<sup>r</sup> Periodic tests from approved sources to verify quality.					
16. Fiber Log <sup>s</sup>	3895	Visual Inspection	None	See Footnote <sup>s</sup>	1 m <sup>2</sup> (1 Sq yd)
<sup>s</sup> Periodic tests from approved sources to verify quality.					
17. Inlet Protection <sup>t</sup>	3891	Visual Inspection	None		
<sup>t</sup> Periodic tests from approved sources to verify quality. Check approved products list and Specification.					
18. Hydraulic Soil Stabilizer <sup>u</sup>	3884	Slump Test for Type 8	None	None	
<sup>u</sup> Periodic tests from approved sources to verify quality. Check approved products list.					

**SCHEDULE OF MATERIALS CONTROL**

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

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

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
19. Filter Logs <sup>v</sup>	3897	Visual Inspection	None	None	
<sup>v</sup> Periodic tests from approved sources to verify quality. Check approved products list.					
20. Flocculants <sup>w</sup>	3898	Visual Inspection	None	None	
<sup>w</sup> Periodic tests from approved sources to verify quality. Check approved products list.					

## SCHEDULE OF MATERIALS CONTROL

## VI. CHEMICAL ITEMS

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

CALL CHEMICAL LABORATORY (651) 366-5548

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
<b>3. Waterproofing Materials</b>					
Only waterproofing systems from approved sources are allowed for use. The most current list can be found at <a href="http://www.dot.state.mn.us/products">www.dot.state.mn.us/products</a>					
A. Membrane Waterproofing System	3757	Visual Inspection	2410 Sample ID Card	1 per shipment (Membrane Only)	0.1 m <sup>2</sup> (1 Sq Ft)
<b>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.</b>					
B. Three Ply System	<b>Three Ply System, containers will be stamped if approved prior to shipment. CALL CHEMICAL LABORATORY (651) 366-5548</b>				
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 <sup>2</sup> (1 Sq yd)

## SCHEDULE OF MATERIALS CONTROL

## VI. CHEMICAL ITEMS (cont'd)

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

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
<b>4. Paints</b>					
A. Traffic Marking Paint	<b>Only traffic marking paints from Qualified Products List are allowed for use.</b>				
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)
<b>Waterborne Latex and Epoxy Traffic Paint: The most current Qualified Products List can be found at <a href="http://www.dot.state.mn.us/products">www.dot.state.mn.us/products</a> Call Laboratory at (651) 366-5550 for pre-approved lots.</b>					
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)
<b>For traffic marking paints other than Waterborne Latex and Epoxy see Special Provision for Qualified Products List.</b>					
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)
<b>Only approved paints are allowed for use. For bridge coatings, see <a href="http://www.dot.state.mn.us/products">www.dot.state.mn.us/products</a> for the approved products list. For all others, see the Special Provisions. Send color sample to Chemical Laboratory for color matching.</b>					
<b>5. Drop-on Glass Beads</b>	3592	Visual Inspection	2410	1 per lot	1 L (qt.)
<b>Only glass beads from Qualified Products List are allowed for use. The most current Qualified Products List can be found at <a href="http://www.dot.state.mn.us/products">www.dot.state.mn.us/products</a> Call Laboratory at (651) 366-5550.</b>					
<b>6. Pavement Marking Tape</b>	3353 3354 3355 Special Provisions	Visual Inspection	2410 Sample ID Card	1 clean sample of each color per lot	3 m (3 yds.)
<b>Only pavement marking tape from Qualified Products List are allowed for use. The most current Qualified Products List can be found at <a href="http://www.dot.state.mn.us/products">www.dot.state.mn.us/products</a></b>					
<b>7. Signs and Markers</b>	3352	Visual Inspection	02415	None unless material suspect	
<b>Only SIGNS AND MARKERS from Qualified Products List are allowed for use. The most current Qualified Products List can be found at <a href="http://www.dot.state.mn.us/products">www.dot.state.mn.us/products</a></b>					

## SCHEDULE OF MATERIALS CONTROL

## VII. METALLIC MATERIALS AND METAL PRODUCTS

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

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
<b>1. Guard Rail</b>					
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 sample from one edge of each 200 rail sections or one sample of each 100 terminal sections	Full depth x 0.25 m (full depth x 10")
<p><b>REMARKS: Applicable to all Guardrail A, B, &amp; C. To be approved before use. Pre-tested or Inspected will carry "Inspected" tag. Not Pre-tested: Submit laboratory samples at required laboratory rate.</b></p> <p><b>For small quantities, lab samples not required, but document on Form 02415 or 2403 and maintain in project file.</b></p> <p><b>SMALL QUANTITIES: Rail Sections - 20 or less      Terminals - 10 or less</b>  <b>Post Bolts - 100 or less                      Splice Bolts - 100 or less</b></p>					
<b>2. Steel Posts</b>					
A. Sign Posts	3401	Visual Inspection	02415 or 2403	Two posts per shipment of each MASS per UNIT LENGTH	Submit shortest full sized length of each weight, not a scrap piece.
B. Fence Posts, Top Rails and others	3403* 3406* 3379*	Visual Inspection	Same	Include all of the following, if used on the project: For posts and top rail, one sample per 500 pieces or less, but not less than two samples per shipment; Three each of the following fittings and hardware items (cups, caps, nuts and bolts, end clamp, tension bands, and truss rod tightener); Twelve hog rings; Six tie wires, One full tension stretcher bar; One truss rod, cut to 2-foot minimum to include treaded section.	Need full length for posts used in the ground (line, terminal, "C" and anchor posts), not scrap pieces. Need 5' length of top rail, and brace bar. <b>For others see column to the left ←.</b>
<p><b>REMARKS: * For 3403, 3406, &amp; 3379 submit Certificate of Compliance and certified mill analysis with sample.</b></p> <p><b>Note: For fence items, two additional samples are needed for a retest, therefore it is recommended that two additional samples be taken and retained for each sample sent in for lab testing. If the initial test passes, then the additional items should be returned to the Contractor.</b></p>					
<b>3. Fence Wire</b>					
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><b>REMARKS: * For 3376, submit Certificate of Compliance. Two additional samples are needed for a retest; see note above (VII, 2 B).</b></p>					
<b>4. Water Pipe and other Piping Materials</b>	3364, 3365, 3366 & Special Provisions		02415 or 2403		
<p><b>REMARKS: To be identified and tested if necessary <u>prior</u> to use. Retain Form 02415 or 2403 in project files. SEE SPECIAL PROVISIONS.</b></p>					

## SCHEDULE OF MATERIALS CONTROL

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

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

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
<b>5. Reinforcing Steel</b>					
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)
<b>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>					
B. Steel Fabric	3303	Visual Inspection		No Field Sample Necessary	
<b>REMARKS: Retain Certificate of Compliance in project file.</b>					
C. Dowel Bars	3302			One Dowel Bar from each shipment	Full Size Dowel Bars
<b>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.</b>					
D. Prestressing Strand	3348			One sample (2 strands) from each heat	1.8 m (6 ft)
<b>REMARKS: Submit one copy of mill certificate and one copy of the stress-strain curve representative of the lot with the samples.</b>					
<b>6. Drainage and Electrical Castings</b>	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 651-366-5540 for list of approved foundries, or see website. <b>REMARKS: Inspect in the field and retain Form 02415 or 2403 in project file, showing NAME OF FOUNDRY AND QUANTITY</b>					
<b>7. Anchor Rods and Bolts (Cast in Place)</b>	3385	Pre Approved			
<b>Notes: Manufacturer must have one yearly passing test from the Department for each anchor rod or bolt type. Prior to installation, obtain copy of Mn/DOT passing test report from supplier. Specs 3385.2 A, B, &amp; C require anchor rod markings per ASTM F 1554 S3. The end of each anchor bolt intended to project from the concrete must be die stamped with the grade identification as follows: Grade 36 = AB36, Grade 55 = AB55, Grade 105 = AB105.</b>					
<b>8. Anchorages (Drilled In)</b>	Special Provisions	Visual Inspection		Three complete anchorages	
<b>Note: Before installation, verify that anchorages are on the qualified products list <a href="http://www.dot.state.mn.us/products">www.dot.state.mn.us/products</a></b>					

## SCHEDULE OF MATERIALS CONTROL

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

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

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
<b>9. Structural Steel</b>					
A. For Concrete Girders-Diaphragms and sole plates	2471	Field inspection: Check for damage and defects. Check dimensions for contract compliance.	2415 or 2403	None except suspect material quality	Entire lot
<b>Remarks: Only suppliers (fabricators, galvanizers, paint shops) with approved Quality Control Plans (QCP's) shall only be used to supply diaphragms and sole plates. A list of approved suppliers can be found on the Bridge Office internet site.</b>					
B. Steel Bearings	2471	Field inspection: Check for damage and defects. Check dimensions for contract compliance.	2415 or 2403	None except suspect material quality	Entire lot
<b>Remarks: Only suppliers (fabricators, galvanizers, paint shops) with approved Quality Control Plans (QCP's) shall only be used to supply steel bearings. A list of approved suppliers can be found on the Bridge Office internet site.</b>					
C. Expansion joints	2471	Field inspection: Check for damage and defects. Check dimensions for contract compliance.	2415 or 2403	None except suspect material quality	Entire lot
<b>Remarks: Only suppliers (fabricators, galvanizers, paint shops) with approved Quality Control Plans (QCP's) shall only be used to supply expansion joints. A list of approved suppliers can be found on the Bridge Office internet site.</b>					
D. Railing-Structural tube and ornamental	2471	Field inspection: Check for damage and defects, especially the coating. Check dimensions for contract compliance.	2415 or 2403	None except suspect material quality	Entire lot
<b>Remarks: Only suppliers (fabricators, galvanizers, paint shops) with approved Quality Control Plans (QCP's) shall only be used to supply structural tube and ornamental railing. A list of approved suppliers can be found on the Bridge Office internet site.</b>					
E. Drainage Systems	2471	Field inspection: Check for damage and defects. Check dimensions for contract compliance.	2415 or 2403	None except suspect material quality	Entire lot
<b>Remarks: Only suppliers (fabricators, galvanizers, paint shops) with approved Quality Control Plans (QCP's) shall only be used to supply drainage systems. A list of approved suppliers can be found on the Bridge Office internet site.</b>					
F. Protection Angles	2471	Field inspection: Check for damage and defects. Check dimensions for contract compliance.	2415 or 2403	None except suspect material quality	Entire lot
<b>Remarks: Only suppliers (fabricators, galvanizers, paint shops) with approved Quality Control Plans (QCP's) shall only be used to supply protection angles. A list of approved suppliers can be found on the Bridge Office internet site.</b>					



## SCHEDULE OF MATERIALS CONTROL

## VIII. MISCELLANEOUS MATERIALS

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

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		
<b>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.</b>					
2. Miscellaneous pieces and Hardware (Galvanized)	3392 3394		02415 or 2403	Three samples of each item per shipment. Sample critical items only. (Critical items are load bearing, structurally necessary items.)	Three of each type.
<b>REMARKS: Will carry "Inspected" tag if sampled and tested prior to shipment. No sample necessary if "Inspected".</b>					
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
<b>REMARKS: Submit copy of Certificate of Compliance with pad. <u>DO NOT</u> USE ANY PADS THAT ARE NOT CERTIFIED</b>					

## SCHEDULE OF MATERIALS CONTROL

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

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

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
<b>1. Corrugated Metal Products</b>					
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		
<b>REMARKS: Make certain pipe is Certified on Invoice</b>					
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				
<b>REMARKS: The Fabricator's Certificate and Guarantee shall be on file in the Mn/DOT Central Laboratory.</b>					
<b>2. Clay Pipe</b>	3251	No samples required for less than 100 pieces	02415 or 2403	1 sample per 200 pieces of each size.	Full Size Pipe
<b>REMARKS: To be sampled and inspected in the field.</b>					
<b>3. Concrete Pipe</b>					
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 651-366-5540 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
<b>REMARKS: For Concrete Pipe Both A &amp; 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</b>					

## SCHEDULE OF MATERIALS CONTROL

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

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

Kind of Material	Spec. No.	Tests by Producers	Form No.	Tests by Mn/DOT	Sample Size
<b>4. Precast/Prestressed Concrete Structures</b>					
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 651-366-5540 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 <sup>3</sup> (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 651-366-5540 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 <sup>3</sup> (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.	
<b>REMARKS: Precast/prestressed structures including boxes will be inspected and stamped at source. Only spot checks for dimensions are performed.</b>					

## SCHEDULE OF MATERIALS CONTROL

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

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

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
<b>5. Manholes and Catch Basins (Construction)</b>	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		
<b>REMARKS:</b> 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).					
<b>6. Drain Tile (Clay or Concrete)</b>	3276	Visual Inspection		2 samples of each size from each source	
<b>7. Thermoplastic (TP) Pipe ABS and PVC</b>	3245	Obtain Certificate of compliance. Check for approved marking printed on pipe. Field Inspect for damage or defects.	02415 or 2403		
<b>REMARKS:</b> 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.					
<b>8. Corrugated Polyethylene Pipe</b>	3278	Check for markings (AASHTO M 252) Certificate of Compliance. Field Inspect for damage or defects.	02415 or 2403	No Laboratory tests required	
<b>9. Sewer Joint Sealing Compound</b>	3724			One per shipment	0.5 liter (1 pt.)
<b>10. Preformed Plastic Sealer for Pipe</b>	3726 Type b			One from each source	0.3 m (1 ft)
<b>11. Bituminous Mastic Joint Sealer for Pipe</b>	3728	Visual Inspection		Sample, if questionable	

## SCHEDULE OF MATERIALS CONTROL

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

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

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
<b>12. Geotextile Fabric and Geogrid Reinforcement</b>	3733 and Special Provisions	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).		(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 m <sup>2</sup> (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.	(a) 3m (10 Lin. Ft.) (b) 3m <sup>2</sup> (4 sq. yd.)* (c) 3m (10 Lin. Ft.)**
<p><b>Note 1:</b> 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 I through VI requirements for the specific application. Submit copy of Certificate with material samples sent to the Materials Laboratory.</p> <p><b>Note 2:</b> Submit additional sample(s), if the manufacturer or model of geotextile or geogrid used changes during construction.</p> <p><b>REMARKS:</b> 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, 651-366-5451 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 full turn of rolled product. For sample, cut 1 m (3ft) wide strip across width of roll {usually 3 - 4 m (12 - 14 ft)}.</p> <p>** Seam sample to include approximately 0.6 m (2 ft.) of geosynthetic material on each side of seam (in direction perpendicular to seam).</p>					
<b>13. Silt Fence</b>	3886	Visual Inspection Check Product Label		For amounts 300 m (1000 ft) or greater.	3 m (9 ft)
<p><b>REMARKS:</b> Samples sent 21 days prior to use. Check Approved Products List of accepted geotextiles</p>					
<b>14. EPS Geofoam</b>	Special Provisions	Visual Inspection Check for yellow aged material, uniformity and dimensions. Weigh 1'x1'x1' cut coupon to verify density every 200 m <sup>3</sup> (250 yd <sup>3</sup> )	02415 or 2403		

## SCHEDULE OF MATERIALS CONTROL

## X. BRICK, STONE, AND MASONRY UNITS

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

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
<b>1. Brick</b>					
A. Sewer (clay) and Building	3612 to 3615	Visual Inspection		One sample per 50,000 brick or fraction thereof	6 whole bricks
B. Sewer (Concrete)*	3616	Visual Inspection		One sample per shipment.	6 whole bricks
* Air entrainment required. Obtain air content statement from supplier.					
<b>2. Concrete Masonry Units</b>					
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.					
<b>3. Reinforced Concrete Cribbing</b>	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.					
<b>4. Stone for Masonry or Rip-Rap</b>	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

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

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 (Precast), (PVC), and (LLDPE)	2545 2550 2565		02415 or 2403		
REMARKS: Traffic signal and street lighting projects require handholes to be listed on the Mn/DOT Signals Qualified Products List (QPL). For cast iron frame and cover: see VII.6, Drainage Castings					
3. Foundation	2545	Slump as needed		1 cylinder per 20 m <sup>3</sup> (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 (Rigid) and HDPE)	3803 Special Provisions	Visual Inspection	02415 or 2403		
REMARKS: Conduit will bear UL labels. Retain Form 02415 or 2403 in Project File. For traffic signal and street lighting projects, specific requirements are contained in the Special Provisions for each project.					
5a. Anchor bolts (cast in place)					
See section VII, 7.					
5b. Anchorages (Drilled In)					
See section VII, 8.					
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 use if not tested.</u> Field sample at sampling rate for laboratory testing. For traffic signal and street light lighting projects, various miscellaneous hardware is required to be listed on the Mn/DOT Signals and Lighting Qualified Products Lists (QPL). The Contract documents indicate, which items must be on the Signals and/or Lighting QPL.					

## SCHEDULE OF MATERIALS CONTROL

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

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

Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Form No.	Minimum Required Sampling Rate for Laboratory Testing	Sample Size
<b>7. Cable and Conductors</b>					
A. Power Conductors Loop Detector Conductors (No Tubing)	3815.2B1 3815.2B2(a)	Visual Inspection	02415 or 2403	None	
<b>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>					
B. Electrical Cables and Single Conductors with Jacket	3815.2B2(b) 3815.2B3 3815.2B5 3815.2C1 3815.2C3 3815.2C4 3815.2C5 3815.2C6 3815.2C7 3815.2C8 3815.2C14 Special Provisions	Visual Inspection	02415 or 2403	1 sample per size per lot	1.5m (5 ft)
<b>REMARKS: Usually inspected at the distributor. Documentation showing project number, reel number(s), &amp; 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 651-366-5540 or Cindy Schellack at 651-366-5543 with questions. For traffic signal and street lighting projects, the Special Provisions for each project contain electrical cable and conductor specifications.</b>					
C. Fiber Optic Cables	3815.2C13	Visual Inspection	02415 or 2403	1 sample per size per lot	1.5m (5 ft)
<b>8. Ground Rods</b>	2545 2565	Visual Inspection	02415 or 2403	None.	
<b>REMARKS: Retain Form 02415 or 2403 in project file.</b>					
<b>9. Luminaires and Lamps</b>	2545		02415 or 2403		
<b>REMARKS: Traffic signal and street lighting projects require luminaires and lamps to be listed on the Mn/DOT Lighting Qualified Products List (QPL). The conductors shall bear UL label and type, where applicable.</b>					
<b>10. Electrical Systems</b>					
<b>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</b>					
<b>11. Traffic Signal Systems</b>					
<b>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</b>					