DATE: April 26, 2011

TO: ALL BIDDERS

SUBJECT: SAP 07-606-13, 07-614-10, 07-617-15, & CP 8140
BLUE EARTH COUNTY
Letting Date: May 6, 2011

ADDENDUM NO. 2

Bidders are hereby advised that the following additions, deletions and corrections to the Plans and Proposal for the above subject shall be considered when preparing a bid:

PROPOSAL

The Minnesota Department of Transportation Schedule of Materials Control dated April 6, 2010 included in the proposal is deleted in its entirety, and replaced with the attached Minnesota Department of Transportation Schedule of Materials Control dated April 15, 2011.

The April 15, 2011 Schedule of Materials control is also available at http://www.dot.state.mn.us/materials/labdocs/2011MCSFinal.pdf

Receipt of this addendum shall be acknowledged in accordance with the provision of 1210 of the Standard Specifications. In addition, each bidder shall sign and date this Memo and return a fax as acknowledgment of receiving this addendum No. 2. (FAX No. 507-304-4049).

Bidder Name_____ Date_____

Signature_____

Sincerely,

Alan Forsberg
PUBLIC WORKS DIRECTOR
Blue Earth County Highway Dept.

Minnesota Department of Transportation Schedule of Materials Control – Introduction Page

(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.

Laboratories performing acceptance tests for payment shall be accredited by the AASHTO Materials Reference Laboratory (AMRL) or a comparable accreditation program approved by Mn/DOT and the FHWA for all test procedures performed.

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 02415 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) 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 from the Geotechnical Section, the Grading & Base Unit. The Department maintains the Approved/Qualified Products List and the Certified Products and Services List, as well as, the Schedule of Materials Control.

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.

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

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Certifications List

Material	Section	Sub Section	Page	Certification Needed
All Granular Materials	I. Grading & Base	Many	7-11	Form 24346 and Test Results
Plant Mixed Asphalt (PMA)	II. Bituminous	Many	12-17	All PMA from certified supplier www.dot.state.mn.us/materials/bituminous.html
Shingles	II. Bituminous	2	13	Contractor shall provide documentation that of all RAS /TOSS (Tear Off Shingle) material is from a MPCA certified supplier.
Bituminous Material	II. Bituminous	9	16	Only Bituminous Materials from certified asphalt binder sources are allowed for use. The most current list of Certified Sources can at http://www.dot.state.mn.us/products
Emulsions	III. Seal Coat		19	Use Emulsion for seal coat from a certified asphalt emulsion source.
Emulsions	III. Seal Coat		19	Use Emulsion for Fog Seal from a certified asphalt emulsion source.
Emulsions	III. Micro surfacing		20	Use Asphalt Emulsion from a certified asphalt emulsion source.
Emulsions	III. Micro surfacing		21	Use Micro surfacing Emulsion from a certified asphalt emulsion source.
Emulsions	III. Micro surfacing		22	Use Fog Seal Emulsion from a certified asphalt emulsion source.
Concrete Ready Mix	IV. Concrete	Many	23-37	Contact Report from Ready-Mix Plant. All concrete from certified plant including a computerized certificate of compliance with each load.
Ground Granulated Blast Furnace Slag Fly Ash Admixtures Cement	IV. Concrete		24	Concrete Plant Batching Materials: All materials must come from certified approved, or qualified sources. All certified sources must state so on the Bill of Lading Delivery invoice including Mn/DOT standardized certification statement for cement, flyash, and slag. The most current list of certified/approved sources can be found at www.dot.state.mn.us/products.

Material	Section	Sub Section	Page	Certification Needed
Air Content	IV. Concrete ready-mix for concrete paving		29	Certificate of Compliance.
Plastic for Curing	IV. Concrete		32	A Certificate of Compliance shall be submitted to the Project Engineer from the Manufacturer certifying that the plastic complies with AASHTO M171.
Aggregate for Low Slump Overlays	IV. Concrete		36	Aggregate pit numbers and 1 passing gradation result per fraction each time aggregate is delivered to the site
Profiler	IV. Concrete		35	Contractor provides Mn/DOT certified Inertial Profiler Results for bumps/dips and/or Areas of Localized Roughness for the entire project.
Aggregate for Concrete Pavement Repair	IV. Concrete		37	Aggregate pit numbers and 1 passing gradation result per fraction each time aggregate is delivered to the site
Aggregate for Dowel Bar Retrofits	IV. Concrete		38	Aggregate pit numbers and 1 passing gradation result per fraction each time aggregate is delivered to the site
Plant Stock & Landscape Materials	V: Landscaping etc.	2	39	Several certifications
Silt Fence	V: Landscaping etc.	5	40	Certificate of Compliance with MARV values
Flotation Silt Curtain	V: Landscaping etc.	6	40	Manufacturers' certification of compliance
Mulch Type 3	V: Landscaping etc.	12	40	Certified Vendor by Minnesota Crop Improvement Association must be tagged grain straw only on label.
Mulch Type 6 Wood Chips	V: Landscaping etc.	13	41	Emerald Ash Borer Compliance Agreement with the MDA
Seeds	V: Landscaping etc.	14	41	Certified Vendor by Minnesota Crop Improvement Association must be tagged.
Seeds - Native	V: Landscaping etc.	14	41	Certified Vendor by Minnesota Crop Improvement Association must be tagged.
Sod	V: Landscaping etc.	15	41	A certified tag by Minnesota Crop Improvement Association for Salt tolerant sod. A certificate of Compliance for all other types of sod listing grass varieties.
Compost	V: Landscaping etc.	16	41	A/QPL with certified test reports.
Waterproofing material membrane waterproof system	VI: Chemical Items		42	Certificate and test results
Waterborne latex traffic marking paint	VI: Chemical Items		43	Certificate of Compliance
Epoxy traffic paint	VI: Chemical Items		43	Certificate of Compliance
Traffic marking paint	VI: Chemical Items		43	Certificate of Compliance
Non-traffic marking paint	VI: Chemical Items		43	Certificate of Compliance
Bridge structural steel paint	VI: Chemical Items		44	Certificate of Compliance
Exterior masonry paint	VI: Chemical Items		44	Certificate of Compliance
Noise wall stain	VI: Chemical Items		44	Certificate of Compliance
Drop-on glass beads	VI: Chemical Items		44	Certificate of Compliance
Pavement marking tape	VI: Chemical Items		44	Certificate of Compliance
Steel sign posts	VII: Metallic	2	46	Certification of domestic source if applicable under 1601.
Posts for traffic or fence	VII: Metallic	3A	46	Certification of domestic source if applicable under 1601. For fence: fence certification form.
Fence components	VII: Metallic	3B	46	Fence certification form.
Fence gates	VII: Metallic	3C	46	Fence certification form.
Fence barbed wire fabric	VII: Metallic	3D	46	Fence certification form.
Fence woven wire fabric	VII: Metallic	3E	47	Fence certification form.

Material	Section	Sub Section	Page	Certification Needed
Fence chain link wire fabric	VII: Metallic	3F	47	Fence certification form.
Reinforcing steel uncoated bars	VII: Metallic	5A	47	Certificate of Compliance & certified mill analysis
Reinforcing steel epoxy bars	VII: Metallic	5B	48	Inspected tag or Certificate of Compliance & certified mill analysis
Steel Fabric	VII: Metallic	5E	48	Certificate of Compliance
Dowel Bars	VII: Metallic	5F	48	Certificate of Compliance
Pre or post tensioning strand	VII: Metallic	5G	49	Mill analysis
Anchor rods & Structural Fasteners	VII: Metallic	7	49	Yearly Mn/DOT passing test report
Timber & lumber	VIII: Miscellaneous	1	53	Certified on invoice
Elastomeric bearing pad	VIII: Miscellaneous	4	53	Certificate of Compliance
Corrugated metal pipe	IX: Geosynthetics & Pipe	1A	53	Certified on invoice
Corrugated metal structural plate	IX: Geosynthetics & Pipe	1B	53	Certified on invoice
Corrugated metal aluminum plate	IX: Geosynthetics & Pipe	1C	54	Fabricator's Certificate and guarantee
Concrete pipe & manholes reinforced	IX: Geosynthetics & Pipe	3A	54	Certified stamp and certification document
Concrete pipe non reinforced	IX: Geosynthetics & Pipe	3B	54	Certified stamp and certification document
Precast box culverts	IX: Geosynthetics & Pipe	4A	55	Stamped & field inspection report
Prestressed beams & posts, etc	IX: Geosynthetics & Pipe	4B	55	Stamped & field inspection report
Manholes & catch basins	IX: Geosynthetics & Pipe	5	56	Certification document or stamped
Thermoplastic pipe ABS & PVC	IX: Geosynthetics & Pipe	7	56	Certificate of Compliance
Corrugated PE Pipe: Single wall – edge drains	IX: Geosynthetics & Pipe	8	56	Certificate of Compliance
Corrugated PE Pipe: dual wall – 12"-48"	IX: Geosynthetics & Pipe	13	57	Certificate of Compliance
Geotextile fabric	IX: Geosynthetics & Pipe	14	58	Manufacturers' Certification of compliance
Brick sewer concrete	X: Brick, Stone, Masonry	1B	59	Air content statement
Concrete masonry units	X: Brick, Stone, Masonry	2A	59	Air content statement
Light standards	XI: Electrical & Signal	1	60	Certificate of Compliance
Cable & Conductors	XI: Electrical & Signal	7	61	Usually inspected at the distributor. Documentation showing project number, reel number(s), & Mn/DOT test number(s) will be included with each project shipment. If not received from Contractor, submit sample for testing along with manufacturers' material certification.
Electrical systems	XI: Electrical & Signal	10	62	Electrical Systems are to be reported as a "System" using the Lighting, Signal, and Traffic Recorder Inspection Report.
Traffic signal systems	XI: Electrical & Signal	11	62	Traffic Signal Systems are to be reported as a "System" using the Lighting, Signal, and Traffic Recorder Inspection Report.

Telephone Index for Schedule of Materials Control

Section	Page	Section Name	Contact	Phone
Part I	Page 7	Grading & Base	Terry Beaudry Cary Efta Rebecca Embacher	(651) 366-5456 (651) 366-5421 (651) 366-5525
Website: www.dot.state.mn.us/materials/gradingandbase.html				
Part II Part II B 4	Page 12 Page 16	Bituminous - Spec. 2360 Asphalt Binder	John Garrity Jim McGraw Jason Szondy	(651) 366-5577 (651) 366-5548 (651) 366-5549
Website: www.dot.state.mn.us/materials/bituminous.html				
Part III	Page 18	Seal Coating – Spec 2356	Erland Lukanen Tom Wood	(651) 366-5460 (651) 366-5573
Part IV	Page 23	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: www.dot.state.mn.us/materials/concrete.html				
Part V	Page 39	Landscaping and Erosion Control Items Erosion Control Landscaping Wood Chips	 Lori Belz Scott Bradley Tina Markeson	 (651) 366-3607 (651) 366-4612 (651) 366-3619
Part VI	Page 42	Chemical Items	Jim McGraw Dave Iverson	(651) 366-5548 (651) 366-5550
Part VII	Page 45	Metallic Materials and Metal Products Sampling Test Results Bridge Structural Metals	 Steve Grover Laboratory Todd Niemann Barry Glassman	 (651) 366-5540 (651) 366-5560 (651) 366-4567 (651) 366-4568
Part VIII	Page 53	Miscellaneous Materials Sections 1thru 3 Section 4 Test Results	 Steve Grover Todd Niemann Barry Glassman Laboratory	 (651) 366-5540 (651) 366-4567 (651) 366-4568 (651) 366-5560
Part IX	Page 53	Geosynthetics, Pipe, Tile, and Precast/Prestressed Concrete Sections 1 thru 11, & 13 Section 12 Section 14 Test Results	 Steve Grover Rich Lamb Randy Tilseth Laboratory	 (651) 366-5540 (651) 366-5595 (651) 366-5451 (651) 366-5560
Part X	Page 59	Brick, Stone and Masonry Units/Modular Retaining Wall Blocks Sections 1, 2A,3, & 4 Section 2B Test Results	 Steve Grover Blake Nelson Laboratory	 (651) 366-5540 (651) 366-5599 (651) 366-5561
Part XI	Page 60	Electrical & Signal Sections 1, 8-11 Section 2, 4- 7 Section 3 Test Results	 Susan Zarling Steve Grover Wendy Garr Laboratory	 (651) 234-7052 (651) 366-5540 (651) 366-5423 (651) 366-5560

Form Index

Grading and Base	
Form No.	**Form Name**
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
Concrete	
Form No.	**Form Name**
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"
21763	Concrete Aggregate Worksheet
21764	Concrete Aggregate Worksheet JMF
24143	Weekly Certified Ready-Mix Plant Report (Verification)
24300	ID Card Cement Samples
24308	ID Card Fly Ash Samples
24327	Field Core Report
	Concrete W/C Ratio Calculation Worksheet
	Incentive/Disincentive Smoothness Worksheet
Bituminous	
Form No.	**Form Name**
2413	Asphalt Sample Identification Card
Miscellaneous	
Form No.	**Form Name**
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)
	Certification Form for Type of Fence used, see on right side of page, www.dot.state.mn.us/materials/lab.html

I. Grading and Base Construction Items 2005 and 2011 Spec Book (www.dot.state.mn.us/materials/gradingandbase.html)

Pay Item Number	Material	Spec. No.	Minimum Contractor Quality Control Testing Rate	Minimum Agency Verification (Acceptance) Testing Rate (see note 1)	Minimum Field Sample Size	Minimum Companion (Lab) Sample Rate & Size (See Note 2)	Form No. (See Note 4)
(a) 2118 (b) 2211 (c) 2221	**1. Gradation** (a) Aggregate Surfacing (b) Aggregate Base (c) Aggregate Shoulders	3138 & Special Provisions	Production: 1/1,000 ton Placement: 1/5,000 ton	**Random Sampling** **a)** For less than 2,200 yd^3 (CV) use Individual **Tests** 1 test /550 yd^3 **b)** For more than 2,200 yd^3 (CV) use lots. Maximum lot size is 5,500 yd^3 (CV) Average 4 tests/Lot	60 lb	1 per source 30 lb	02115-03, 02154-02, & 24346-02
(d) 2105	(d) Stabilizing Aggregate	3149 & Special Provisions					
(e) 2211	(e) Open Graded Aggregate Base (OGAB)	Special Provisions	4 per source before placing on project	1/550 yd^3 (CV)		1 per source 30 lb	02115-03, 24346-02, & 02402-03
(f) 2105	(f) Granular Borrow Select Granular Borrow	3149 & Special Provisions	1/10,000 yd^3 (CV) (See Note 2)	1/20,000 yd^3 (CV) (See Note 2)		1 per source 30 lb (Salvage Bit. See Note 3)	
(g) 2331	(g) Full Depth Reclamation (FDR)	Special Provisions	1/6,000 yd^2	1/12,000 yd^2	None	None	02115-03 & 02402-03
(h) 2511	(h) Granular Filter	3601 & Special Provisions	1 per source before placing on project	1 per source (See Note 2)	300 lb	1 per source 150 lb	02115-03, 24346-02, & 02402-03

I. Grading and Base Construction Items (cont.)

Pay Item Number	Material	Spec. No.	Minimum Contractor Quality Control Testing Rate	Minimum Agency Verification (Acceptance) Testing Rate (See Note 1)	Minimum Field Sample Size	Minimum Companion (Lab) Sample Rate & Size (See Note 2)	Form No. (See Note 4)
(i) 2451 (j) 2451 (k) 2451 (l) 2451	(Continued) **1. Gradation** (i) Granular Backfill (j) Aggregate Backfill (k) Granular Bedding (l) Aggregate Bedding	3149 & Special Provisions	2 per source before placing on project	1 per source (See Note 2)	60 lb	1 per source 30 lb (Salvage Bit. See Note 3)	02115-03, 24346-02, & 02402-03
(m) 2451 (n) 2502 (o) 2206	(m) Coarse Filter Aggregate (n) Fine Filter Aggregate (o) Sand Cover	3149 & Special Provisions				1 per source 30 lb	
(a) 2211 (b) 2221	**2. Moisture – Density Test** (*Required for Specified Density*) (Proctor) (a) Aggregate Base (b) Aggregate Shoulder	2211, 2221, & Special Provisions	**2005 Spec Book**: Contractor is encouraged to perform tests **2011 Spec Book**: 1 per source	**2005 Spec Book**: 1/25,000 yd^3 (per source) **2011 Spec Book**: none	50 lb	One sample minimum 25 lb	24587-01
(c) 2105	(c) Embankment Soil (Excavation & Borrow)	2105	**2005 Spec Book**: Contractor is encouraged to perform tests **2011 Spec Book**: 1 major soil type - See Note 6	**2005 Spec Book**: 1 per major soil type – See Note 6 **2011 Spec Book**: none		Two samples minimum 25 lb	
(a) 2211 (b) 2221	**3. Relative Density Test** (*Required for Specified Density*) (a) Aggregate Base (b) Aggregate Shoulder	2211 & Special Provisions	**Contractor is encouraged to perform tests for process control.**	1/1,000 yd^3 (CV)	None	None	02115-03 & 02140-03
(c) 2105	(c) Embankment Soil (Excavation & Borrow)	2105 & Special Provisions		1/4,000 yd^3 (CV)			

I. Grading and Base Construction Items (cont.)

Pay Item Number	Material	Spec. No.	Minimum Contractor Quality Control Testing Rate	Minimum Agency Quality Verification (Acceptance) Rate (See Note 1)	Minimum Field Sample Size	Minimum Companion (Lab) Sample Rate & Size (See Note 2)	Form No. (See Note 4)
(a) 2211 (b) 2221	**4. Penetration Index Method (DCP)** (a) Aggregate Base (b) Aggregate Shoulder	2211, 2221, & Special Provisions	**Contractor is encouraged to perform tests for process control.**	1 DCP test/500 yd^3 (CV)	None	None	02115-03 & 02170-02
(c) 2331	(c) Full Depth Reclamation (FDR)	2331 & Special Provisions		1 DCP test/3,000 yd^2			
(d) 2502	(d) Fine Filter Aggregate (Edge Drains)			See Special Provisions			
(a) 2211 (b) 2221	**5. Modified Penetration Index Method (DCP)** (Special Provisions) (a) Aggregate Base (b) Aggregate Shoulder	2211 2221	**Contractor is encouraged to perform tests for process control.**	1 DCP test/500 yd^3 (CV)			02115-03 & Special Provisions
(c) 2105	(c) Granular Borrow Select Granular Borrow	2105, 3149, & Special Provisions		1 DCP test/2,000 yd^3 (CV)			
(a) 2211 (b) 2221	**6. Relative Moisture** (*Required for Specified Density*) (a) Aggregate Base (b) Aggregate Shoulder	2211, 2221, & Special Provisions	**2005 Spec Book**: Contractor is encouraged to perform tests **2011 Spec Book**: 1/1,000 yd^3	**2005 Spec Book**: 1 per 1/1,000 yd^3 or 10 tests whichever is less **2011 Spec Book**: none			02115-03 & 21850-02
(c) 2105	(c) Embankment Soil (Excavation & Borrow)	2105 & Special Provisions	**2005 Spec Book**: Contractor is encouraged to perform tests **2011 Spec Book**: 1/10,000 yd^3	**2005 Spec Book**: 1 per 1/10,000 yd^3 **2011 Spec Book**: none			

I. Grading and Base Construction Items (cont.)

Pay Item Number	Material	Spec. No.	Minimum Contractor Quality Control Testing Rate	Minimum Agency Verification (Acceptance)Testing Rate (See Note 1)	Minimum Field Sample Size	Minimum Companion (Lab) Sample Rate & Size (See Note 2)	Form No. (See Note 4)
(a) 2211 (b) 2221	**7. Moisture Content**, (Dry Weight) (Required for Quality Compaction, Penetration Index Method, & Modified Penetration Method) (a) Aggregate Base (b) Aggregate Shoulder	2211, 2221, & Special Provisions	**2005 Spec Book**: Contractor is encouraged to perform tests **2011 Spec Book**: 1/1,000 yd^3	**2005 Spec Book**: 1 per 1/1,000 yd^3 or 10 tests whichever is less **2011 Spec Book**: none	None	None	02115-03 & 21850-02
(a) 2105 2118 2211 2221	**8. Percent Crushing** (a) Belt Samples	3138, 3149, & Special Provisions	One Per Day	None			02463 & 24346-02
(b) 2105 2118 2211 2221	(b) Particle Count			One Per Source (See Note 7)			
2105 2118 2206 2211 2221 2451 2502	**9. Aggregate** (Quality Tests)	3138, 3149, & Special Provisions	1/source (See Note 5)	None		1 per source 30 lb (See Note 3)	None

I. Grading and Base Construction Items (cont.)

General Note: Sampling and Testing Procedures are found in the Grading and Base Manual in Section 5-692.200.

Note 1: Samples are not required for 500 ton or less. Report small quantities on form 02415 or 2403.

Note 2:

a) Laboratory samples are not required for 1,000 tons or less.
b) Include the laboratory companion with the first field sample..
c) Include the field sample results with the laboratory sample.
d) Laboratories with AMRL Accreditation are not required to submit laboratory companion samples.

Note 3: Carbonate aggregate materials require 50 lbs for the lab.

Note 4: Forms are available on the Grading & Base website at: http://www.dot.state.mn.us/materials/gradingandbase.html

Note 5: The Contractor may use the Ignition Oven (Mn/DOT Lab. Manual Method 1853) to determine bitumen content.

Note 6: Major soil types are defined in the Triaxial Chart located in the Grading and Base Manual.

II. Bituminous Construction Items for Specification 2360 (Note #1)
(All bituminous mixtures are from Certified Plants) (www.dot.state.mn.us/materialsbituminous.html)

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 (mixture) Agency (density cores)	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 required to test this sample. The results shall be used as part of the QC program.	Agency	Agency	Contractor
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

A. Pre-Production Sampling and Testing for Specification 2360

SAMPLE SIZE: 35 kg (80 lb.) - plus #4 aggregate sample for quality testing and Percent Crushing
15 kg (35 lb.) - minus #4 aggregate for quality testing
35 kg (80 lb.) – RAP for Quality Testing
5 kg (10 lb.) – RAS (Shingles) for Gradation and Quality Testing
33 kg (75 lb.) - bituminous mixture plus 2 Gyratory specimens for volumetric testing
35 kg (80lb.) - bituminous mixture for TSR testing (option A)
8 kg (18 lb.) - bituminous mixture for TSR testing plus 6 Gyratory specimens (option B)
1 kg (2 lb.) - for mineral filler.

1. Bituminous Mix Design (QC/QA)

QC Testing
REMARKS: Mix Design for Spec. 2360 is Contractor's responsibility with review by Mn/DOT.

QA Testing
For Gyratory Design, Option 1- Laboratory Mix Design: In addition to reviewing the Trial Mix data (JMF), test Contractor's two Gyratory specimens and uncompacted mixture (specimens and mixture submitted at optimum asphalt content). Also, evaluate TSR per 2360.2E5a(3). For option 2, Modified Mix Design, review Trial Mix data only.

For Gyratory Design Option 2, Modified Mix Design, review Trial Mix data only.

II. Bituminous Construction for Specification 2360 (Part A, cont.)

2. Aggregate Quality Testing (QA Only)

QA Testing
Contractor shall provide 24 hour notice of intent to sample aggregates for quality testing. Agency has the option to monitor sampling.

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 when the mixture contains RAP or RAS. 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.
Contractor shall provide documentation that of all RAS /TOSS (Tear Off Shingle) material is from a MPCA certified supplier.

3. Mineral Filler (QA Only)

QA Testing
One (1) per shipment of 45 metric tons (50 tons) or less, unless previously inspected.

4. Additives (QA Only)

QA Testing
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^3 (250,000 gal.) (approximately 1,000 ton).

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
35 kg (75 lb.) for each RAP material for Quality Testing
5 kg (10 lb.) RAS (Shingles) for Processed Gradation and Quality Testing
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)

1. Plant Mix Aggregate Gradation Testing (QC/QA, Verification*)
QC Testing
1 per 450 metric tons (500 tons) at start of production, for the first 1,800 metric tons (2,000 tons) of mixture produced, then 1 per 900 metric tons (1,000 tons) or portion thereof per mix blend as required by 2360. 2G6
Companion samples taken for agency.
REMARKS: See Note #2, Note #3, & Note #5.
QA Testing
Companions to QC samples set aside for 10 calendar days & tested as needed. The Agency representative observes QC testing as needed.

2. Aggregate Percent Crushing (QC/QA, Verification*)
QC Testing
Testing rates as required by 2360.2G6 CAA, 2360.2G6 FAA. Two tests per day (CAA, FAA) for first two days. If CAA results exceed the specification minimum by 8% of the requirement; sample daily, test minimum one per week. If FAA results exceed the specification minimum by 5% of the requirement; sample daily, test minimum one per week.
REMARKS: See Note #2, Note #3, & Note #4
QA Testing
Companions to QC samples set-aside for 10 calendar days and tested as needed. The Agency representative observes QC testing as needed.

3. Aggregate Quality Testing (QA Only)
QA Testing
When aggregate qualities approach specification limits or when material variation is observed, take additional field samples as requested by Project Engineer.
When material variation is observed in RAP or RAS take additional field samples as requested by Project Engineer.

II. Bituminous Construction for Specification 2360

B. Bituminous Production for Specification 2360 (cont.)

4. Asphalt Binder Content, % (QC/QA, Verification)

QC Testing

1 per 450 metric tons (500 tons) per mix blend for first 1,800 metric tons (2,000 tons) of mixture produced. Then 1 per 900 metric tons (1000 tons) or portion thereof per mix blend as required by 2360.2G6

REMARKS: See Note #5.

(a) Meter Method (Virgin only)..... Mn/DOT Bituminous Manual
(b) Incinerator Oven..... Mn/DOT Lab Manual Method 1853
(c) Chemical Extraction..... Mn/DOT Lab Manual Method 1851 or 1852
(d) Spot Check (Virgin only)..... Mn/DOT Bituminous Manual 5-693.848

REMARKS: The verification companion sample must use Method (b) or (c) only. When more than one Mn/DOT approved test procedure is available, the Contractor shall select one method at the beginning of the project (when material is submitted for Trial Mix Review) and use that method for the entire project. The Contractor and Engineer may agree to change test procedures during the construction of the Project.
REMARKS: See Note #2 & Note #3. If a member of a monitoring team observes the Contractor test, note and sign under remarks.
REMARKS: A computer file of the plant's control settings is required every 20 minutes for verifying the % add AC

QA Testing Companions to QC samples set aside for 10 calendar & tested as needed. The Agency representative observes QC testing as needed. The Agency will review the computer files of the plant's control settings.

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

Maximum Specific Gravity, Gyratory Bulk Specific Gravity - 2 Specimen Average, air voids, Adjusted Asphalt Film Thickness (AFT), asphalt binder content, gradation, and AC/Total AC ratio.
REMARKS: See Note #7 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, & Note #9.

QA Testing

Companion samples to QC samples set aside for 10 calendar 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.

II. Bituminous Construction for Specification 2360

B. Bituminous Production for Specification 2360 (cont.)

6. Core Density and Thickness

QC Testing

Production/lot testing rate requirements.

Daily Production Metric Ton	English (ton)	Lots
270* – 545	(300* – 600)	1
546 – 910	(601 – 1000)	2
911 – 1455	(1001 – 1600)	3
1456 – 2359	(1601 – 2600)	4
2360 – 4173	(2601 – 4600)	5
4174+	(4601 +)	#

Add 1 lot/every 900 tons over 4601 tons (4174 metric tons)

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

Core locations determined and marked by Agency. Companion cores are required for each Contractor density core. 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. See Note #8 for Longitudinal joint density cores.

QA Testing

Core locations determined and marked by Agency. Agency representative observes all Contractor coring, measuring, sawing and testing, and takes possession of Agency 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, Note #8, and Note #9

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.

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

QC Sampling

Sample as directed by the Engineer. If the Engineer requires the samples to be tested, both the Contractor and the Department will be required to test these samples within 72 hours after they are sampled.

QA Testing

When QC sampling is required, the companion sample to QC sample shall be submitted to the District/Division Materials Lab and tested as needed.

II. Bituminous Construction Items for Specification 2360

B. Bituminous Production for Specification 2360 (cont.)

9. BITUMINOUS MATERIALS

Only Bituminous Materials from Certified Sources are allowed for use. The most current list of Certified Sources can at http://www.dot.state.mn.us/products

SAMPLE SIZE: 1 L (1 qt) for Asphalt Binder (QA)/Cutback Asphalt (QA) 2 L (½ gal) for Asphalt Emulsion (QA)

Pay Item No.	Material	Spec. No.	Quality Control (QC)	Quality Assurance (QA)	Form No.
2360	Asphalt Binder	3151.2A	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 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 (1 qt) steel container.	2413 Asphalt Sample Identification Card
2201 2355 2356 2357 2514	Asphalt Emulsion	3151.2C		Sample first shipment, then submit one sample per 200 m^3 ((50,000 gal.). Sample asphalt emulsion in clean two L (2 qt.) plastic container with wide screw top and send to Mn/DOT Chemical Lab within 7 days of sampling.	
2357 2358 2514	Cutback Asphalt	3151.2B		Cutback Asphalt should only be used in cold temperature applications with the Engineer's approval. Contact Bituminous Engineering Unit for cold temperature application guidelines. Pressure fit 1 L (1qt.) container for cutback asphalt.	

10. Moisture Content in Mixture (QC only)

QC Testing

Sampling and testing shall be conducted by the Contractor on a daily basis unless exempted by the Engineer and tested according to the procedures in the Laboratory Manual 1855. Moisture contents above 0.3% are not allowed.

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.

II. Bituminous Construction for Specification 2360

B. Bituminous Production for Specification 2360 (cont.)

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 Mixture Quality Management, 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 The Department will select at least one of the two companion cores per lot to be tested for mat density. 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, measuring 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 Mn/DOT projects in the 2011 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 #8 When required, Longitudinal Joint (LJ) Density will be evaluated at random lots as determined by the engineer. Number of LJ lots for the day = number of lots calculated for mat density divided by .20 and rounding up to the next integer. Minimum of one LJ lot per day. For designated LJ lots the agency will test at least one of the mat density companion cores and at least one of the LJ companion cores.

Note #9 Random number generation and determination of random sample location shall be consistent with the Mn/DOT Bituminous Manual Section 5-693.7 Table A or Section 5 of ASTM D3665. The Engineer may approve alternate methods of random number generation.

III. Construction Items for the following Special Provisions

A. (2356) Bituminous Seal Coat, Otta Seal, and Micro Surfacing

B. (2213) Permeable Asphalt Stabilized Relief Course (PASSRC) and Permeable Asphalt Stabilized Base (PASB)

C. (2356) Ultra Thin Bonded Wearing Course (UTBWC)

D. (2357) Bituminous Tack Coat

DEFINITIONS				
Sample Type	**Description**	**Sample Location Determined By**	**Sample Taken By**	**Sample Tested By**
	Definitions from 23 CFR 637.203			
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
	Mn/DOT Definition			
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.

III. Construction Items for Special Provisions (cont.)

A. (2356) Bituminous Seal Coat, Otta Seal, and Micro Surfacing

D. (2357) Bituminous Tack Coat (cont.)

SAMPLE SIZE:	**Mix Design: 150 lbs.**				
Pay Item No.	**Test Type**	**Spec. No.**	**Quality Control (QC)**	**Quality Assurance (QA)**	**Form No.**
2356	Seal Coat Mix Design Gradation and Aggregate Qualities	2356	One per source Average gradation during production. % Shale Static Stripping Test Flakiness Index Los Angeles Rattler Aggregate design application rate. Bit. Material design application rate Loose unit mass (weight) of the aggregate Bulk specific gravity of the aggregate	Verify all QC results and review mix design.	
2356 Bit Seal Coat & Otta Seal	Seal Coat Aggregate Stockpile Production Gradation Construction	2356	Test for gradation. One per day, or one per 1360t (1500 tons), whichever is greater. If a temporary stockpile is used, test at this location. Sample for gradation. One per day. Test if required by the Engineer. All samples shall be taken from chip spreader hopper.	Test for gradation. One per day, or one per 1360t (1500 tons), whichever is greater. If a temporary stockpile is used, test at this location. Sample for gradation. One per day. Test if required by the Engineer. All samples shall be taken from chip spreader hopper.	
2356 Bit Seal Coat & Otta Seal 2357	Seal Coat Emulsion Application rate Fog Seal Emulsion Application rate		Use a certified asphalt emulsion source. Verify the application rate daily by dividing the volume used by the area covered. Use a certified asphalt emulsion source. Verify the application rate daily by dividing the volume used by the area covered	Sample first shipment, then submit one sample per 200 m^3 (50,000 gal.). Sample asphalt emulsion in plastic container with wide screw top and immediately send to Mn/DOT Chemical Lab. One sample to test fog seal for dilution rate. Sample asphalt emulsion in plastic container with wide screw top and immediately send to Mn/DOT Chemical Lab.	2413 Asphalt Sample ID Card 2413 Asphalt Sample ID Card

III. Seal Coat Construction Items for Special Provisions (cont.)

B. (2213) Permeable Asphalt Stabilized Stress Relief Course (PASSRC) and Permeable Asphalt Stabilized Base (PASB)

Pay Item No.	Test Type	**Spec. No.**	**Quality Control (QC)**	**Quality Assurance (QA)**	**Form No.**
2213 PASSRC & PASB	Mix Design	2356 3139 3151	Submit 80 lbs of coarse and 30 lbs of fine aggregates for each JMF blend. Submit 4 qts of required binder from a certified Supplier	Verify aggregate qualities and perform a mix design.	
2213 PASSRC & PASB	Production Mix	2356	Sample 35 lbs (15 kg) of blended aggregate from the belt. Test for gradation and CAA. Sample and test one per 500 ton (450 tonne) at the start of production for the first 2000 ton(1800 tonne). Then test one per day or one per 1000 ton (907 tonne), whichever is greater.	Verify gradation and CAA, once per day.	
	Asphalt Binder	3151	Asphalt spot check (min 1 per day) Sample first load. Submit sample in 1 qt (l L) can. QC testing is the responsibility of the Material supplier.	Inspector observes contractor taking sample.	

C. (2356) Seal Coat - Micro-surfacing, Ultra Thin Bonded Wearing Course

Pay Item No.	Test Type	**Spec. No.**	**Quality Control (QC)**	**Quality Assurance (QA)**	**Form No.**
2356 UTBWC	Mix design	2356 3139 3151	Contractor create mix design and submit to Agency for review Submit 80 lbs of coarse and 30 lbs of fine aggregates for each JMF blend	Verify all QC results and review mix design.	
2356 UTBWC	Production mix	2356	Sample 55 lbs (25 kg) of mix from truck every 300 tons (270 tonne). Test for % AC, gradation, max gravity and adj AFT	Verify % AC, gradation , max gravity and adj AFT. Min once per day	
	Asphalt Binder	3151	Sample first shipment, then submit one sample per 250,000 gal. (1,000,000 liters). Submit sample in 1 qt (l L) can.	Inspector observes contractor taking sample.	
	Polymer Modified Emulsion Membrane	3151	Sample first shipment, then one per 50,000 gal (200,000 liters). Submit sample in ½ gal (2 L) wide screw top container.	Inspector observes contractor taking sample.	

III. Seal Coat Construction Items for Special Provisions (cont.)

C. (2356) Seal Coat - Micro-surfacing, Ultra Thin Bonded Wearing Course

SAMPLE SIZE: Mix Design: 150 lbs.					
Pay Item No.	**Test Type**	**Spec. No.**	**Quality Control (QC)**	**Verification**	**Form No.**
2356 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	3151	Certified asphalt emulsion source Residue after Distillation Softening Point Penetration at 25C (77F) Absolute Viscosity at 60C (140F)		
	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)	Review test results submitted in the mix design format required in the special provision.	
2356 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	

III. Seal Coat Construction Items for Special Provisions (cont.)

C. (2356) Seal Coat - Micro-surfacing, Ultra Thin Bonded Wearing Course

Pay Item No.	Test Type	Spec. No.	Quality Control (QC)	Verification	Form No.
2213 2356 Mirco surfacing	Emulsion		Use a Certified asphalt emulsion source.	Sample first shipment, then submit one sample per 200 m^3 (50,000 gal.). Sample asphalt emulsion in plastic container with wide screw top and immediately send to Mn/DOT Chemical Lab.	2413 Asphalt Sample ID Card
	Quantity		Verify the quantity using equipment counter readings.		
	Fog Seal (when required)		Use a certified asphalt emulsion source.	One sample to test fog seal for dilution rate. Sample asphalt emulsion in plastic container with wide screw top and immediately send to Mn/DOT Chemical Lab.	2413 Asphalt Sample ID Card
	Application rate		Verify the application rate daily by dividing the volume used by the area covered.		

IV. Concrete Construction Items (www.dot.state.mn.us/materials/concrete.html)

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.

If concrete quantities on the entire project total < 100 m^3 (yd^3), Form 02415 or Form 2403 Inspection Report for Small Quantities may be used in lieu of the Weekly Concrete Report.

It is recommended that the Agency Plant Monitor be present during critical pours, such as superstructure or paving concrete (i.e. 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.

The first load of concrete for any pour must have passing air content and slump results, prior to placing.

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 in the field and review Certificates of Compliances. It is not a recommended practice to only perform minimum testing requirements and leave the pour.

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 required to test this sample. The results shall be used as part of the QC program.	Agency	Agency	Contractor
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

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Concrete Plant Batching Materials

Remarks:

(1) All materials must come from certified or qualified sources. All certified sources must state so on the delivery invoice.
(2) The most current list of certified/approved sources can be found at www.dot.state.mn.us/products.

Sample Sizes:

Cementitious: 2 kg (5 lb)
Admixture: 0.25 L (1/2 pt) Producer obtains samples from dispensing tubes. Store samples in plastic container.
Water: 3.5 L (1 gal) Store sample in a clean glass or plastic container.

Pay Item No.	Material	Spec. No.	Minimum Required Sampling Rate for Laboratory Testing	Form No.
2301 2302 2401 2405 2411 2412 2422 2452 2461 2506 2511 2514 2519 2521 2531 2533 2545 2550 2554 2557 2564 2565	Portland Cement Slag Blended Cement	3101 3102 3103	1 sample per project or 1 every 3 months, whichever is less. The Producer obtains and stores the sample in a sealed container provided by the Agency, and includes the supplier's delivery invoice from which the sample is obtained. Take additional samples as Concrete Engineer directs.	24300 ID Card Cement Samples
	Fly Ash	3115		24308 ID Card Fly Ash Samples
	Admixtures (Accelerating, Retarding, Water-Reducing, Air-Entraining, etc.)	3113	For Concrete Paving: 1 sample of each shipment For Other Concrete: 1 sample per project or 1 every 3 months, whichever is less. The Producer obtains and stores the sample in a sealed container provided by the Agency.	2410 Sample ID Card
	Water	3906	1 sample from any questionable source	2410 Sample ID Card
2301	Alkali Silica Reactivity (ASR) Testing	2301	1 per paving project per sand source Write "Project Specific ASR Testing" on 2410 Sample ID card for the first sand quality and cementitious samples submitted.	

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Certified Ready-Mix - Concrete Plant Production

Remarks:

(1) Mix design is provided by Mn/DOT unless otherwise specified in the Contract.
(2) All gradation and quality tests require companion samples. Samples taken at location identified on Contact Report located at plant.
(3) Perform Quality testing as directed by the Concrete Engineer.

Minimum Sample Sizes:

Gradation Test:		**Moisture Test:**		**Quality Sample Size for Lab Submittal:**	
+19 mm (3/4" Plus)	10 (25 lb.)	Coarse Aggregate	2000 g (4.4 lb.)	+19 mm (3/4" Plus)	25 kg (50 lb.)
–19 mm (3/4" Minus)	5 kg (10 lb.)	Fine Aggregate	500 g (1.1 lb.)	–19 mm (3/4" Minus)	15 kg (30 lb.)
CA-70, CA-80	2.5 kg (5 lb.)			Fine Aggregate	15 kg (30 lb.)
Sand	500 g (1.1 lb.)				

Pay Item No.	Test Type	Spec. No.	Producer/Contractor Testing	Agency Testing	Form No.
2302 2401 2405 2411 2412 2422 2452 2461 2506 2511 2514 2519 2521 2531 2533 2545 2550 2554 2557 2564 2565	Gradation Testing (QC/QA) (5-694.145 and 5-694.148)	2461 3126 3137	When over 20 m^3 (yd^3) of Agency concrete produced per day: **Coarse:** 1 per 100 m^3 (yd^3) **Fine:** 1 per 200 m^3 (yd^3) Passing aggregate gradations are required prior to the start of concrete production each day. Performing testing on representative material at the end of the most recent day of production is allowed. Washing the fine aggregate gradation (QC) sample is not required when the result on the -75µm (#200) sieve of the unwashed sample is less than 1.0%, Hold QA (QC companion) samples until they are picked up by the Agency monitor. Discard after 14 calendar days if not picked up.	None	21763 Concrete Aggregate Worksheet (QC/QA) 2449 Weekly Concrete Aggregate Report

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Certified Ready-Mix - Concrete Plant Production (cont.)

Pay Item No.	Test Type	Spec. No.	Producer/Contractor Testing	Agency Testing	Form No.
2302 2401 2405 2411 2412 2422 2452 2461 2506 2511 2514 2519 2521 2531 2533 2545 2550 2554 2557 2564 2565	Gradation Testing (Verification/ Verification Companion) (5-694.145 and 5-694.148)	2461 3126 3137	Test the Verification Companion sample. Complete on the day the sample was taken. Wash all fine aggregate Verification Companion samples.	**Coarse and Fine:** 1 per day or 1 per 1000 m^3 (yd^3) whichever results in the lowest sampling rate. - 2 Verification samples per week when Agency production is 3 or more days per week. When $\leq$ 20 m^3 (yd^3) of Agency concrete is produced **per week,** Verification samples are not required. Identify verification samples with a "V" on the Sample ID Card and the verification companion sample. Include verification companion results.	2449 Weekly Concrete Aggregate Report 24143 Weekly Certified Ready-Mix Plant Report (Verification)
	Quality Testing including Coarse Aggregate Testing on -75µm (#200) (5-694.146)	3126 3137	Test at Contractor's Discretion	1 test each fraction per month Identify quality samples with a "Q" on the Sample ID Card and the Quality companion sample.	2410 Sample ID Card
	Aggregate Moisture Testing (QC) (5-694.142)	2461	**When over 20 m^3 (yd^3) of Agency concrete produced per day:** **Coarse and Fine:** 1 per 200 m^3 (yd^3) or completed every 4 hours, whichever results in the highest sampling rate. - Complete the initial moisture content and adjust the batch water prior to the start of concrete production each day. - If weather conditions allow, performing moisture testing on representative material at the end of production the prior evening is allowed. 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.	None	2152 Concrete Batching Report

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Concrete Pavement - Concrete Plant Production

Remarks:

(1) Mix Design is Contractor's responsibility with review by Mn/DOT unless otherwise specified in the Contract.

(2) When incentives apply according to 2301:

a) Contractor QC Technician and Agency Plant Monitor are required to be present during the entire pour.

b) A certified ready-mix plant shall be **dedicated (provides concrete only to the concrete paving project)**.

(3) All gradation samples shall be taken in the presence of the Agency, unless otherwise authorized by the Engineer. All gradation and quality tests require companion samples

(4) Perform Quality testing as directed by the Concrete Engineer.

Minimum Sample Sizes:

Gradation Test:		**Moisture Test:**		**Quality Sample Size for Lab Submittal:**	
+19 mm (3/4" Plus)	10 (25 lb.)	Coarse Aggregate	2000 g (4.4 lb.)	+19 mm (3/4" Plus)	25 kg (50 lb.)
–19 mm (3/4" Minus)	5 kg (10 lb.)	Fine Aggregate	500 g (1.1 lb.)	–19 mm (3/4" Minus)	15 kg (30 lb.)
CA-70, CA-80	2.5 kg (5 lb.)			Fine Aggregate	15 kg (30 lb.)
Sand	**500 g (1.1 lb.)**				

Pay Item No.	Test Type	Spec. No.	Producer/Contractor Testing		Agency Testing	Form No.
2301	Gradation Testing (QC/QA) (5-694.145 and 5-694.148)	3126 3137	**For a concrete paving batch plant:** **When over 200 m^3 (250 yd^3) is produced per day:** 1 per 750 m^3 (1000 yd^3) or completed 1 per ½ day, whichever results in the highest sampling rate.	**For a certified ready-mix plant:** **When over 20 m^3 (yd^3) is produced per day:** 1 per 175 m^3 (250 yd^3) or completed every 4 hours, whichever results in the highest sampling rate.	Test the first 4 QA samples of production each time the Contractor mobilizes the plant or changes aggregate sources. 1 per day on randomly selected samples thereafter. Identify the gradation samples with "QA Gradation" on the Sample ID Card and include the JMF Number and the QC Gradation results. **If Coarse Aggregate Quality Incentive/Disincentives apply:** The Agency may also use the QA gradation sample for the Coarse Aggregate Quality incentive/disincentive testing. In this case, notify the Producer/Contractor to double the QC/QA gradation sample size.	21764 Concrete Aggregate Worksheet JMF Well-graded Concrete Aggregate Worksheet
			Performing testing on representative material at the end of the most recent day of production is allowed. 5 per day maximum **If well-graded aggregate incentives apply:** Use the Contractor's gradation results for well-graded aggregate incentive calculations as verified by Agency testing			

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Concrete Pavement - Concrete Plant Production							
Pay Item No.	**Test Type**	**Spec. No.**	**Producer/Contractor Testing**		**Agency Testing**		**Form No.**
2301	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, changes aggregate sources, or the cleanliness of the coarse aggregate is in question. 1 test per day thereafter		On the first day of production and each time the Contractor mobilizes the plant, changes aggregate sources, or the cleanliness of the coarse aggregate is in question: Test the first sample and then at least 1 of the next 3 samples. 1 test per week thereafter **Test these samples at the plant.**		21764 Concrete Aggregate Worksheet JMF
	Aggregate Moisture Testing (QC/Verification) **(5-694.142)**		**<u>For a concrete paving batch plant:</u>** **If w/c incentives do not apply:** 1 per 750 m^3 (1000 yd^3) or completed every 4 hours, whichever results in the highest sampling rate.	**<u>For a certified ready-mix plant:</u>** **If w/c incentives do not apply:** 1 per 175 m^3 (250 yd^3) or completed every 4 hours, whichever results in the highest sampling rate	**<u>For a concrete paving batch plant:</u>** **If w/c incentives apply:** 1 per 750 m^3 (1000 yd^3) or completed every 4 hours, whichever results in the highest sampling rate. Take initial samples for aggregate moisture testing within the first 175 m^3 (250 yd^3).	**<u>For a certified ready-mix plant:</u>** **If w/c incentives apply:** 1 per 175 m^3 (250 yd^3) or completed every 4 hours, whichever results in the highest sampling rate. Take initial samples for aggregate moisture testing within the first 75 m^3 (100 yd^3).	Concrete W/C Ratio Calculation Worksheet
			Complete the initial moisture content and adjust the batch water prior to the start of concrete production each day. If weather conditions allow, performing moisture testing on representative material at the end of production the prior evening is allowed.		**If w/c incentives apply:** Use aggregate moisture results for determining the water content to calculate the w/c ratio incentive/disincentive. **Do not leave samples unattended.**		

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Concrete Pavement - Concrete Plant Production

Pay Item No.	Test Type	Spec. No.	Producer/Contractor Testing	Agency Testing		Form No.
2301	Water Content Verification Testing **(Microwave Oven Verification) (5-694.532)**		Sample the fresh concrete at the plant.	**If w/c incentives apply:** Microwave oven verification testing to verify the w/c ratio is completed in conjunction with Agency aggregate moisture testing. **Do not leave samples unattended.**		Concrete W/C Ratio Calculation Worksheet
				<u>For a concrete paving batch plant:</u> Take initial sample for microwave oven verification testing within the first 175 m^3 (250 yd^3). At least one additional verification test should be taken if more than 750 m^3 (1000 yd^3) is produced in a day.	**<u>For a certified ready-mix plant:</u>** Take initial sample for microwave oven verification testing within the first 75 m^3 (100 yd^3). At least one additional verification test should be taken if more than 175 m^3 (250 yd^3) is produced in a day.	
	Unit Weight (QC) (5-694.542)		Test one load of concrete per day at the plant.	None		
	Air Content (QC) (5-694.541)	2461	Test the first load of concrete at the plant.	None		

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Concrete Pavement - Concrete Plant Production					
Pay Item No.	**Test Type**	**Spec. No.**	**Producer/Contractor Testing**	**Agency Testing**	**Form No.**
2301	Quality Testing including Coarse Aggregate Testing on -75 µm (#200)	3126 3137	Test the -75µm (#200) on the Quality companion sample the day it was sampled. All other testing is at the Contractor's discretion	1 test each fraction every 17,500 m^3 (20,000 yd^3) of production. Split the Quality sample 4 ways: 1) Provide 2 quarters of the sample to the Producer/Contractor. 2) Test the -75µm (#200) on the quality sample at the plant the day it was sampled. 3) Submit the remaining sample to the lab for quality testing including testing on the -75µm (#200) sieve. Identify quality samples with a "Q" and record the QC and QA -75µm (#200) test results on the Sample ID Card. Identify the Quality Companion samples with a "Q"..	2410 Sample ID Card

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Concrete Pavement - Concrete Plant Production

Pay Item No.	Test Type	Spec. No.	Producer/Contractor Testing	Agency Testing	Form No.
2301	Coarse Aggregate Quality Testing for Incentive/ Disincentive	3137	Test at Contractor's discretion	**If coarse aggregate quality incentives apply:** Test the Class B aggregates for % absorption and Class C aggregates for % carbonate including any other tests necessary to make those determinations. Sample the 2 largest fractions in accordance with the following table and 2301: :	2410 Sample ID Card Coarse Aggregate Quality Incentive/ Disincentive Worksheet

Coarse Aggregate Quality Incentive/Disincentive Sampling Rates

Plan Concrete m^3 [**cubic yards**]	Samples per fraction (n)
2,900 – 6,250 [3,500 – 7,500]	3
6,251 – 8,500 [7,501 – 10,000]	5
8,501 – 21,000 [10,001 – 25,000]	10
21,001 – 42,000 [25,001 – 50,000]	15
42,001+ [50,001+]	20

Identify incentive samples on the Sample ID Card with "I/D."

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Concrete Field Materials (Refer to Metallic Materials and Metal Products for sampling requirements for concrete reinforcement.)

Sample Sizes:

Joint Materials:

Hot Poured Elastomeric:	5 kg (10 lb)	Take samples from application wand into 1 gallon steel container	Preformed Elastomeric:	2 m (6 ft)
Silicone Joint Sealer:	0.5 liter (1 pt)	Store sample in steel container.	Preformed:	0.25 m^2 (2 ft^2)

Curing Materials:

Burlap:	1 m^2 (yd^2)	
Paper and Plastic:	0.25 m^2 (2 ft^2)	
Membrane Compound	1 liter (1 qt)	Materials must be thoroughly stirred or agitated immediately prior to taking sample. Store sample in steel container and cover immediately.

Pay Item No.	Material	Spec. No.	Minimum Required Field Sampling Rate	Form No.
2301 2302 2401 2411 2514 2521 2531	Preformed	3702	Visual Inspection	2410 Sample ID Card
2301 2302 2401	Preformed Elastomeric Type	3721	1 per lot Only joint materials from qualified sources are allowed. The most current lists can be found at www.dot.state.mn.us/products.	
	Silicone Joint Sealer	3722		
	Hot Poured Elastomeric Type	3723 3725		
2301 2302 2401 2411 2514 2520 2521 2531 2533	Burlap	3751	Visual Inspection	
	Paper	3752	Visual Inspection - Must be white opaque	
	Membrane Curing Compound	3754 3754AMS 3755	Refer to the approved products list of curing compounds for **pre-approved** lots at http://www.mrrapps.dot.state.mn.us/CuringCompoundProducts/curingcompounds.aspx	
	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.	

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Concrete Field Testing – Bridges and General Concrete

Pay Item No.	Test Type	Spec. No.	Agency Testing	Form No.
2401 2405 2411 2412 2422 2452 2461 2506 2511 2514 2520 2521 2531 2533 2545 2550 2554 2557 2564 2565	Air Content (Verification) (5-694.541)	2461	1 per 100 m^3 (yd^3) Test first load each day per mix Test when admixture adjustments are made to the mix.	2448 Weekly Concrete Report
	Slump (Verification) (5-694.531)	2461	1 per 100 m^3 (yd^3) Test first load each day per mix Test when admixture adjustments are made to the mix. No slump testing required for slipform placement	
	Concrete Temperature (Verification) (5-694.550)	2461	Record temperature each time air content, slump, or strength test specimen is performed/fabricated.	
	Compressive Strength (Verification) (5-694.511)	2461	1 cylinder per 100 m^3 (yd^3) 1 cylinder per day for sidewalk and curb and gutter A set of 3 cylinders shall be made when control cylinders are needed. Mn/DOT standard cylinder mold size is 100 x 200 mm (4 x 8 inch). If aggregate has a maximum size greater than 31.5 mm (1-1/4 inch), use 150 x 300 mm (6 x 12 inch) molds.	2409 ID Card Concrete Test Cylinder

Concrete Field Testing – Cellular Concrete

Pay Item No.	Test Type	Spec. No.	Agency Testing	Form No.
2519	Compressive Strength (Verification) **(5-694.511)**	2461 2519	1 set of 4 cylinders per day 100 x 200 mm (4 x 8 inch) 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.	2409 ID Card Concrete Test Cylinder

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Concrete Field Testing – Concrete Pavement

Pay Item No.	Test Type	Spec. No.	Contractor Testing	Agency Testing	Form No.
2301	Air Content Before Consolidation (QC/QA) (5-694.541)	2461	1 per 300 m^3 (300 yd^3) or 1 per hour, whichever is less Test first load each day per mix	1 air test per day	2448 Weekly Concrete Report
	Air Content After Consolidation (QC/QA) (5-694.541)	2461	Test 1 air content per ½ day of slip form paving to establish an air loss correction factor (ACF). See Special Provisions for additional information.	1 air test per day	
	Slump (QC/QA) (5-694.531)	2461	**For fixed form placement:** 1 per 300 m^3 (300 yd^3) and as directed by the Engineer Test first load each day per mix **For slipform placement:** No slump testing is required	**For fixed form placement:** 1 slump test per day **For slipform placement:** No slump testing is required	
	Concrete Temperature (QC/QA) (5-694.550)	2461	Record temperature each time air content, slump or strength test specimen is performed/fabricated by the Contractor.	Record temperature each time air content, slump or strength test specimen is performed/fabricated by the Agency.	
	Flexural Strength (QC) (5-694.521)	2301	1 beam (28-day) per day - Make additional control beams as necessary. - Control beams shall be made within the last hour of concrete poured each day. Fabricate beams, deliver beams to curing site, and clean beam boxes.	Supply beam boxes, cure, and test beams.	2162 Concrete Test Beam Data
	Concrete Pavement Texture (QC)	2301	1 per 1000 linear feet per lane of concrete pavement at locations determined by the Agency. All adjoining lanes shall be tested at the same location if paved at the same time. The Contractor supplies all materials necessary to perform the required testing.	Determine texture testing locations using random numbers.	Concrete Texture Worksheet
	Thickness (QC/Verification)	2301	The Contractor drills concrete cores at locations determined by the Agency. The Contractor probes the plastic concrete at locations determined by the Agency.	Determine probing and coring locations using random numbers. Initial pavement at core locations and re-initial the sides of specimens after coring to clearly verify their authenticity.	24327 Field Core Report Probing and Coring Report

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Concrete Field Testing – Concrete Pavement

Pay Item No.	Test Type	Spec. No.	Contractor Testing	Agency Testing	Form No.
2301	Surface Smoothness	2301	Contractor provides Mn/DOT certified inertial profiler results for bumps/dips and/or Areas of Localized Roughness for the entire project as required by the Contract.	None	Concrete Profile Summary Worksheet

Concrete Field Testing - Low Slump Concrete for Bridge Deck Overlays

Remarks:

(1) Mix design is provided by Mn/DOT on the back of the Form 21412 Weekly Report of "Low Slump Concrete" unless otherwise specified in the Contract.
(2) All field gradation samples shall be taken by the Agency. All gradation and quality tests require companion samples.
(3) Perform Quality testing as directed by the Concrete Engineer.

Minimum Sample Sizes:

Gradation Test:		**Quality Sample Size for Lab Submittal:**	
CA-70	2.5 kg (5 lb.)	Coarse Aggregate	25 kg (50 lb.)
Sand	**500 g (1.1 lb)**	**Fine Aggregate**	**15 kg (30 lb.)**

Pay Item No.	Test Type	Spec. No.	Contractor Testing	Agency Testing	Form No.
2404	Gradation and Quality Testing including Coarse Aggregate Testing on -75µm (#200) (QC/Verification) (5-694.145, 5-694.146) and 5-694.148))	3126 3137	Prior to concrete production, the Contractor shall provide the Agency with: • Aggregate pit numbers • 1 passing gradation result per fraction each time aggregate is delivered to the site. No quality test results are required. Test companion samples at Contractor's discretion.	1 per fraction prior to concrete production and each time aggregate is delivered to the site. Identify quality samples with a "Q" on the Sample ID Card and the Quality companion sample.	2410 Sample ID Card 21412 Weekly Report of "Low Slump Concrete"
	Air Content (Verification) (5-694.541)	2461	None	1 per 15 m^3 (yd^3) Test at beginning of pour each day	
	Slump (Verification) (5-694.531)	2461	None	1 per 15 m^3 (yd^3) Test at beginning of pour each day For 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^3 (yd^3)	2409 ID Card Concrete Test Cylinder

Concrete Field Testing – Concrete Pavement Repair (CPR)

Remarks:

(1) Mix design is provided by Mn/DOT unless otherwise specified in the Contract.
(2) Testing rates apply to concrete that is produced on site. (Not from a certified ready-mix plant.)
(3) All field gradation samples shall be taken by the Agency. All gradation and quality tests require companion samples.
(4) Perform Quality testing as directed by the Concrete Engineer.

Minimum Sample Sizes:

Gradation Test:

–19 mm (3/4" Minus)	5 kg (10 lb.)
CA-70, CA-80	2.5 kg (5 lb.)
Sand	**500 g (1.1 lb.)**

Quality Sample Size for Lab Submittal:

Coarse Aggregate	25 kg (50 lb.)
Fine Aggregate	15 kg (30 lb.)

Pay Item No.	Test Type	Spec. No.	Contractor Testing	Agency Testing	Form No.
2302	Gradation and Quality Testing including Coarse Aggregate Testing on -75µm (#200) (QC/Verification) (5-694.145, 5-694.146) and 5-694.148)	3126 3137	Prior to concrete production, the Contractor shall provide the Agency with: • Aggregate pit numbers • 1 passing gradation result per fraction each time aggregate is delivered to the site. No quality test results are required. Test companion samples at Contractor's discretion.	1 per fraction prior to concrete production and each time aggregate is delivered to the site. Identify quality samples with a "Q" on the Sample ID Card and the Quality companion sample.	2410 Sample ID Card
	Air Content (Verification) (5-694.541)	2461	None	1 per 15 m^3 (yd^3) Test at beginning of pour each day.	2448 Weekly Concrete Report
	Slump (Verification) (5-694.531)	2461	None	1 per 15 m^3 (yd^3) Test at beginning of pour each day. 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^3 (yd^3)	2409 ID Card Concrete Test Cylinder

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Concrete Field Testing –Dowel Bar Retrofit (DBR)

Remarks:

(1) Mix Design is Contractor's responsibility with review by Mn/DOT unless otherwise specified in the Contract.
(2) Testing rates apply to concrete that is produced on site. (Not from a certified ready-mix plant.)
(3) All field gradation samples shall be taken by the Agency. All gradation and quality tests require companion samples.
(4) Perform Quality testing as directed by the Concrete Engineer.

Minimum Sample Sizes:

Gradation Test:		**Quality Sample Size for Lab Submittal:**	
CA-80	2.5 kg (5 lb.)	Coarse Aggregate	25 kg (50 lb.)
Sand	**500 g (1.1 lb)**	**Fine Aggregate**	**15 kg (30 lb.)**

Pay Item No.	Test Type	Spec. No.	Contractor Testing	Agency Testing	Form No.
2302	Gradation and Quality Testing including Coarse Aggregate Testing on -75µm (#200) (QC/Verification) (5-694.145, 5-694.146) and 5-694.148)	3126 3137	Prior to concrete production, the Contractor shall provide the Agency with: • Aggregate pit numbers • 1 passing gradation result per fraction each time aggregate is delivered to the site. No quality test results are required. Test companion samples at Contractor's discretion.	1 per fraction prior to concrete production and each time aggregate is delivered to the site. Identify quality samples with a "Q" on the Sample ID Card and the Quality companion sample.	2410 Sample ID Card
	Dowel Bar Retrofit Material Compressive Strength (Verification) (5-694.511)	2301 2302	None	During the pre-production 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. First day of production: 1 set of 3 cylinders tested at 3 hours 1 set of 3 cylinders tested at 1 day After the first day of production: 1 cylinder per day during production tested at rate determined by Engineer.	2409 ID Card Concrete Test Cylinder

V. Landscaping and Erosion Control Items

Pay Item No	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2105 2571 2575	1. Manufactured Topsoil borrow [a] Salvaged Topsoil (stockpiled)	3877.2	None	From each source: One composite sample for the first 765 m^3 (1,000 Cu yd) or less. One composite sample for each additional 2,300 m^3 (3,000 Cu yd) or fraction thereof.	10 kg (20 lb.)	[a] Test results showing meets specifications.. Testing for all topsoil for fertility send directly to University of Minnesota soils lab from project. Testing takes about four weeks after delivery of the sample to the Department Laboratory. Sampling shall be done once source is identified or existing topsoil is stockpiled.
2571 2575 2577	2. Plant Stock & Landscape Materials [b]	3861 and 2571.2A1	Field Inspection at Job Site, submit itemized report for each shipment [c]			[b] 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. [c] 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: 1. A Mn/DOT Certificate of Compliance for Plant Stock, Landscape Materials, and Equipment 2. A valid copy of a nursery stock (dealer or grower) certificate registered with the MN Dept. of Agric. And/ or a current nursery certificate/license from a state or provincial Dept. of Agric. for each plant stock supplier. 3. A copy of the most recent Certificate of Nursery Inspection for each plant stock supplier. 4. Plant material shipped from out-of-state nursery vendors subject to pest quarantines must be accompanied by documentation certifying all plants shipped are free of regulated pests. 5. Bills of lading (shipping documents) for all materials delivered. 6. Invoices for all materials to be used. 7. Each bundle, bale, or individual plant must be legibly and securely labeled with the name and size of each species or variety.
2502 2573 2575 2577	3. Erosion Control Blanket [d]	3885	Visual Inspection	Random - See Footnote [d]	1 m^2 (1 Sq yd)	[d] Check Web site for list of approved products.. www.dot.state.mn.us/products

V. Landscaping and Erosion Control Items (cont.)

Pay Item No	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2573 2577	4. Erosion Control Netting [e]	3885	Visual Inspection	Random - See Footnote [e]	1 m^2 (1 Sq yd)	[e] Check Web site for list of approved products. www.dot.state.mn.us/products
2573	5. Silt Fence [f]	3886	Check Product Label. Obtain Certificate of Compliance with MARV values	For amounts 600m (2000 ft) or greater.	3 m (9 ft)	[f] Samples sent 21 days prior to use. Check Approved/Qualified Products List (A/QPL) of accepted geotextiles.
2573	6. Flotation Silt Curtain [g]	3887	Visual Inspection			[g] Accepted, based on manufacturers' certification of compliance. Check weight of fabric.
2573 2575	7. Erosion Stabilization Mat [h]	3885	Visual Inspection	See Footnote [h]	1 m^2 (1 Sq yd)	[h] Check Web site for list of approved products. www.dot.state.mn.us/products
2573	8. Filter Logs	3897	Visual Inspection	None		
2573	9. Flocculants [i]	3898	Visual Inspection	None		[i] Certificate of Compliance and MSDS to the Engineer.
2571 2575	10. Fertilizer [j]	3881	Visual Inspection			[j] 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.
2571 2575	11. Agricultural Lime [k]	3879	One gradation test for each 180 Metric Ton (200 ton)			[k] Contractor must supply amount of ENP (Equivalent Neutralizing Power) for each shipment.
2575 2577	12. Mulch Material A. Type 3 Mulch - Certified Weed Free (Certified sources only) [l]	3882	Visual Inspection, Check if from Certified Vendor by Minnesota Crop Improvement Association. Must be tagged, grain straw only.			[l] Certified mulch will be indicated by label.

V. Landscaping and Erosion Control Items (cont.)

Pay Item No	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2571 2575 2577	13. Mulch Material B. Type 6 Mulch – Woodchips	3882	Visual Inspection, one gradation per supplier.	Gradation 1/10,000 yd^3 per supplier.		All wood chips supplied by a supplier outside the Emerald Ash Borer quarantine area or have an Emerald Ash Borer Compliance Agreement with the MDA.
2502 2575 2577	14. Seeds A. Seeds (Certified Vendors Only) (Mixes 22-000 and 25-000 series) [m]	3876	Check for Certified Vendor tag from Minnesota Crop improvement Association. If materials are on hand and past the twelve months, testing must be done.		0.5 L (1 pint)	[m] Periodic sampling taken by Office of Environmental Services. Any moldy or insect contaminated seed must be rejected.
2502 2575 2577	14. Seeds B. Native Seed (Mixes 30-000 series) certified seed only [n]	3876	Check if from Certified Vendor by Minnesota Crop Improvement Association, Must be tagged. If materials are on hand and past the twelve months, testing must be done.			[n] Certified seed will be indicated by label on containers. Reject all moldy or insect contaminated seed. Periodic sampling taken by Office of Environmental Services.
2575	15. Sod [o]	3878	A certified tag by Minnesota Crop Improvement Association for Salt tolerant sod. Final Visual Inspection at site.			[o] A Certificate of Compliance must be furnished by the producer to the Engineer for the type of sod supplied showing correct grass varieties.
2571 2575	16. Compost A. Compost Certified Source [p]	3890	Visual Inspection			[p] Check Approved/Qualified Products List (A/QPL).
2571 2575	17. Compost B. Compost Non-Certified Source [q]	3890		Must be sampled - One Sample per 300 m^3 (500 Cu Yd)		[q] Submit samples six weeks before use. Small quantity 75 m^3 (100 Cu Yd) or less.
2575	18. Hydraulic Soil Stabilizer [r]	3884	Slump Test for Type 8	None		[r] Check Approved/Qualified Products List (A/QPL).

VI. Chemical Items

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2401	Asphalt Plank	3204	Visual Inspection	1 per 1,000 plank or less of each thickness in each shipment	3 – 1 m (yd) pieces samples from different planks	
2131	Calcium Chloride	3911	Visual Inspection	Liquid: 1 per 40,000 L (1 per 10,000 gal) Dry: 1 per shipment	0.5 L (1 pint) or 0.5 kg (1 lb.) in Plastic Container	
2131	Magnesium Chloride	3912	Visual Inspection	1 per 40,000 L (1 per 10,000 gal.)	0.5 L (1 pint) in Plastic Container	
2331	Hot-Pour Crack Sealant for Crack Sealing/Filling	3719 3723 3725	Visual Inspection	1 per lot. Take samples from application wand. Use caution when handling hot containers	2.26 kg (5 lb.) in a 1gal steel container.	
2481	Waterproofing Materials Membrane Waterproofing System	3757	Visual Inspection	1 per shipment (Membrane Only)	0.1 m^2 (1 Sq Ft)	Only waterproofing systems from qualified sources are allowed for use. The most current list can be found at www.dot.state.mn.us/products 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.

VI. Chemical Items (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2481	Waterproofing Materials Three Ply System Asphalt Primer	3165	Visual Inspection	1 per shipment	0.5 L (1 pt.) in steel container	
2481	Waterproofing Materials Three Ply System Waterproofing Asphalt	3166	Visual Inspection	1 per shipment	0.5 L (1 pt.) in steel container	
2481	Waterproofing Materials Three Ply System Fabric	3201	Visual Inspection	1 per shipment	1 m^2 (1 Sq yd)	
2582	Waterborne Latex Traffic Marking Paint.	3591	Visual Inspection	1 per lot	0.5 L (1 pint)	**Form 02415** List batch numbers and retain Certificate of Compliance. Only traffic marking paints from Qualified Products List are allowed for use. The most current Qualified Products list can be found at www.dot.state.mn.us/products
2582	Epoxy Traffic Paint	3590	Visual Inspection	1 Part A per lot 1 Catalyst Part B per lot	0.5 L (1 pint)	**Form 02415** List batch numbers and retain Certificate of Compliance. Only traffic marking paints from Qualified Products List are allowed for use. The most current Qualified Products list can be found at www.dot.state.mn.us/products
2582	Traffic Marking Paint	Special Provisions	Visual Inspection	1 Part A per lot 1 Catalyst Part B per lot	0.5 L (1 pint)	**Form 02415** List batch numbers and retain Certificate of Compliance. Only traffic marking paints from Qualified Products List are allowed for use. The most current Qualified Products list can be found at www.dot.state.mn.us For traffic marking paints other than Waterborne Latex and Epoxy. See Special Provision for Qualified Products List.
2564	Non-Traffic Striping Paints	3500 Series Special Provisions	Visual Inspection		0.5 L (1 pint)	**Form 02415** List batch numbers and retain Certification of Compliance. For all others, see Special Provisions. Send color sample to Chemical Laboratory for color matching.

VI. Chemical Items (Cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2478	Bridge Structural Steel Paint	3520	Visual Inspection	Certificate of Compliance with each batch/lot for each component of the paint system to the Engineer. Provide a color "Draw Down" sample to the Mn/DOT Chemical Laboratory for verification of the finish coat color		**Form 02415** List batch numbers and retain Certificate of Compliance. Only paints from Approved Products List are allowed for use. The most current Approved Products List can be found at www.dot.state.mn.us/.
	Exterior Masonry Paint	3584	Visual Inspection	1 per lot Provide a color "Draw Down" sample to the Mn/DOT Chemical Laboratory for verification of the finish coat color.	0.5 L (1 pint)	**Form 02415** List batch numbers and retain Certificate of Compliance Only paints from Approved Products List are allowed for use. The most current Approved Products List can be found at www.dot.state.mn.us/
	Noise Wall Stain	Special Provisions	Visual Inspection	Certificate of Compliance for each batch/lot of paint. Provide a color "Draw Down" sample to the Mn/DOT Chemical Laboratory for verification of the finish coat color.		**Form 02415** List batch numbers and retain Certificate of Compliance Only paints from Approved Products List are allowed for use. The most current Approved Products List can be found at www.dot.state.mn.us/
2582	Drop-on Glass Beads	3592	Visual Inspection	1 per lot	1 L (qt.)	**Form 02415** List batch numbers and retain Certificate of Compliance Only glass beads from Qualified Products List are allowed for use. The most current Qualified Products List can be found at www.dot.state.mn.us/products
2502 2581 2582	Pavement Marking Tape	3354 3355 Special Provisions	Visual Inspection	1 clean sample of each color per lot	3 m (3 yds.)	**Form 02415** List batch numbers and retain Certificate of Compliance. Only pavement marking tape from Qualified Products List are allowed for use. The most current Qualified Products List can be found at www.dot.state.mn.us/products

VI. Chemical Items (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2540 2563 2564 2565 2582	Signs and Markers	3352	Visual Inspection	None unless material suspect		**Form 02415** Only Signs and Markers from Qualified Products List are allowed for use. The most current Qualified Products List can be found at www.dot.state.mn.us/products

VII. Metallic Materials and Metal Products

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2554	1. Guard Rail A. Fittings - Splicers, Bolts, etc.	3381	Visual Inspection	Bolts: 2 Post bolts and 4 splice bolts with nuts for each 1,000 units or less.		**Form 02415 or 2403** To be approved before use. Materials from H&R may be pre-sampled and tested. Call the MN/DOT inspector at 218-846-3613 to see if material has been approved. For non-pre-tested, submit laboratory samples at required rate. For small quantities, lab samples are not required, but document on Form 02415 or 2403 and maintain in project file. Small Quantities: Rail Sections - 20 or less Terminals - 10 or less Post Bolts - 100 or less, Splice Bolts - 100 or less
2554	1.B.i. Non-High Tension Guard Rail Cable	3381	Visual Inspection	1 sample from each spool	1.2 m (4 ft)	**Form 02415 or 2403** See VII.1.A.
2554	1. B.ii. High Tension Guard Rail Cable	Special Provisions	Visual Inspection	1 sample per 50,000 feet	1.2 m (4 ft)	
2554	1. Guard Rail C. Structural Plate Beam	3382	Visual Inspection	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")	**Form 02415 or 2403** See VII.1.A.

VII. Metallic Materials and Metal Products (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2545 2554 2564	2. Steel Sign Posts	3401	Visual Inspection & Certification from Contractor of compliance with Domestic source requirement under 1601, if applicable.	Two posts per shipment of each mass per unit length. Submit shortest full sized length of each weight, not a scrap piece.	See note	**Form 02415 or 2403** Check domestic steel requirement under 1601
2554 2557	3.Posts for Traffic & Fence A.Steel fence posts, brace bars, and rails	3403 3406	Visual Inspection	One sample per 500 pieces. Submit full length for posts used in the ground (line, terminal, "C" and anchor posts), and 5' length of top rail and brace bar.		**Form 02415 or 2403** Check domestic steel requirement under 1601 Special Provision. Retain Certificate of Compliance and certified mill analysis in project file. See link for certification form on right side of page, www.dot.state.mn.us/materials/lab.html
2557	3. Fence B. Components: includes cup, cap, nut, bolt, end clamp, tension band, truss rod tightener, hog ring, tie wire, tension stretcher bar, truss rod, clamp, & tension wire	3376	Visual Inspection	1 each of cup, cap, nut, bolt, end clamp, tension bands, truss rod tightener, 12 hog rings, 6 tie wires, 1 tension stretcher bar; 1 truss rod, cut to 2-foot min. with threaded section, 3 feet of tension wire.		**Form 02415 or 2403** Check domestic steel requirement under 1601 Special Provision. Retain Certificate of Compliance in the project file. See link for certification form on right side of page, www.dot.state.mn.us/materials/lab.html
2557	3. Fence C.Gates	3379	Visual Inspection	No sample required. See notes.		**Form 02415 or 2403** Check domestic steel requirement under 1601 Special Provision. Retain Certificate of Compliance in the project file. See link for certification form on right side of page, www.dot.state.mn.us/materials/lab.html
2557	3. Fence D. Barbed Wire	3376	Visual Inspection.	One full height sample per 50 rolls	1 m (3 ft)	**Form 02415 or 2403** Check domestic steel requirement under 1601 Special Provision. Retain Certificate of Compliance in the project file. See link for cert. form on right side of page, www.dot.state.mn.us/materials/lab.html

VII. Metallic Materials and Metal Products (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2557	3. Fence E. Woven Wire Fabric	3376	Visual Inspection	One full height sample per 50 rolls	1 m (3 ft)	**Form 02415 or 2403** Check domestic steel requirement under 1601 Special Provision. Retain Certificate of Compliance in the project file. See link for cert. form right side of page, www.dot.state.mn.us/materials/lab.html
2557	3. Fence F. Chain Link Fabric	3376	Visual Inspection	One full height sample for each 5,000 ft of fencing.	0.3 m (1 ft)	**Form 02415 or 2403** Check domestic steel requirement under 1601 Special Provision. Retain Certificate of Compliance in the project file. See link for certification form on right side of page, www.dot.state.mn.us/materials/lab.html
2402	4. Water Pipe and other Piping Materials	3364, 3365, 3366 & Special Provisions				**Form 02415 or 2403** Check domestic steel requirement under 1601 Special Provision. To be identified & tested if necessary prior to use. See Special Provisions.
2201 2301 2401 2405 2411 2412 2433 2452 2472 2514 2531 2533 2545 2564	5. Reinforcing Steel A. Bars – Uncoated	3301	Visual Check for Size and Grade Marking	No Field Sample Necessary		**Form 02415 or 2403** For Uncoated bars - Retain Certificate of Compliance and Certified Mill Analysis in Project File.

VII. Metallic Materials and Metal Products (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2201 2301 2401 2405 2411 2412 2433 2452 2472 2514 2531 2533 2545 2564	5. Reinforcing Steel B. Bars - Epoxy Coated	3301	Visual Check for Size and Grade Marking and "Inspected" tag	One sample (1 bar) of each size bar for each day's coating production	1 m (3 ft)	**Form 02415 or 2403** 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 with copies of the , Certificate of Compliance, and Certified Mill Analysis. Retain originals of the Certificate of Compliance and Certified Mill Analysis in the project file.
2401	5. Reinforcing Steel C. Bars Stainless Steel	Special Provisions		One sample (2 Bars) per heat per bar size	1 m (3 ft)	Submit copies of mill test reports with samples, retain originals in project file
2401 2411 2452 2472 2564	5. Reinforcing Steel D. Spirals	3305		One per shipment	1 m (3 ft)	**Same as 5.B**
2201 2301 2401 2411 2412 2472 2531	5. Reinforcing Steel E. Steel Fabric	3303	Visual Inspection	No Field Sample Necessary		Retain Certificate of Compliance in project file.
2201 2301 2401 2411	5. Reinforcing Steel F. Dowel Bars	3302		One Dowel Bar from each shipment	Full Size Dowel Bars	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.

VII. Metallic Materials and Metal Products (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2401 2405	5. Reinforcing Steel G. Prestressing or Post-Tensioning Strand	3348		One sample (2 strands) from each heat (see **Notes**)	1.8 m (6 ft)	Submit one copy of mill certificate and one copy of the stress-strain curve representative of the lot with the samples. For most manufacturers, a heat equals a production lot, and an individual lot, pack, or reel is a subset of a heat/production lot.
2402 2506 2565	6. Drainage and Electrical Castings	3321 2471 2565	Visual Inspection	All castings: Three tensile bars to be cast with each heat at Foundry and submitted to the lab by an approved Foundry*. See 3321.		**Form 02415 or 2403** Call Maplewood Laboratory at 651-366-5540 for list of approved foundries, or see website. Inspect in the field and retain Form 02415 or 2403 in project file, showing name of foundry and quantity
2401 2402 2411 2433 2545 2554 2564 2565	7. Anchor Rods (Cast in Place) and Structural Fasteners	3385 3391	Visual Inspection and Material verification testing.	Pre-approved (see notes) or one complete anchor rod assembly including nuts and washers from each lot supplied.		Pre-approved system requires supplier to submit a sample to the Department yearly for each anchor rod or fastener type. Test results of sample must verify compliance to product specifications. Supplier shall retain copy of passing test results for one year and supply with subsequent jobs. When no previous test results are available, one complete anchor rod assembly with all required nuts and washers shall be sampled and tested from each type on the project. Prior to installation, field to obtain copy of passing test report(s).
2401 2411 2433	8. Anchorages (Drilled In)	Special Provisions	Visual Inspection	No laboratory samples required		Note: Before installation, verify that anchorages are on the qualified products list www.dot.state.mn.us/products
2402	9. Structural Steel A. For Steel Bridge – Beams, Girders, Diaphragms, etc.	2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag. An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/

VII. Metallic Materials and Metal Products (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2402 2405	9. Structural Steel B. For Concrete Girders-Diaphragms and sole plates	2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag. An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/
2402	9. Structural Steel C.. Expansion joints	2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/
2402	9. Structural Steel D. Steel Bearings	2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag . An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/
2402	9. Structural Steel E. Railing-Structural tube and ornamental	2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag. An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/

VII. Metallic Materials and Metal Products (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2402	9. Structural Steel F. Drainage Systems	2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag. An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/
2402	9. Structural Steel G. Protection Angles	2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag . An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/
2564	10. Overhead Sign structures	2564 2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag . An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/

VII. Metallic Materials and Metal Products (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2545	11. High Mast Lighting Structures	2545 2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag . An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/
2565	12. Monotube Signal Structures	2565 2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag . An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/

VIII. Miscellaneous Materials

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2403 2422 2452 2521 2540 2545 2554 2557 2564	1. Timber, Lumber Piling & Posts	3412 to 3471 & 3491	Visual Inspection			**Form 02415 or 2403** 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.
2402 2405 2557 Many	2. Miscellaneous pieces and Hardware (Galvanized)	3392 3394		3 samples of each item per shipment. Sample critical items only. (Critical items are load bearing, structurally necessary items.)	Three of each type.	**Form 02415 or 2403** Will carry "Inspected" tag if sampled and tested prior to shipment. No sample necessary if "Inspected".
2504	3. Insulation Board	3760	Visual Inspection	None		**Form 02415 or 2403**
2402	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	Submit copy of Certificate of Compliance with pad. Do not use any pads that are not certified.

IX. Geosynthetics, Pipe, Tile, and Precast/Prestressed Concrete

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2402 2422 2501 2503 2506	1. Corrugated Metal Products A. Culvert Pipe Underdrains Erosion control Structures	3225 thru 3229, 3351 and 3399	Visual Inspection: Check for good construction, workmanship, finish requirements and shipping			**Form 02415 or 2403** Make certain pipe is Certified on Invoice, retain certificate of compliance and certified mill analysis in project file
2501	1. Corrugated Metal Products B. Structural Plate	3231	Visual Inspection: Invoice shall include notation that material described is in accordance with fabricator's Certificate and Guarantee			**Same as 1.A**

IX. Geosynthetics, Pipe, Tile, and Precast/Prestressed Concrete (Cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2501	1. Corrugated Metal Products C. Aluminum Structural Plate	3233				Retain certificate of compliance and certified mill analysis in project file
2503 2506	2. Clay Pipe	3251	No samples required for less than 100 pieces	1 sample per 200 pieces of each size.	Full Size Pipe	**Form 02415 or 2403**
2501 2503 2506	3. Concrete Pipe A. Reinforced Pipe and Arches Precast Cattle Pass Units Sectional Manhole Units	3236	Field Inspection: Check for damage and defects. Check dimensions as required. Check for producer's "Certified" stamp and signature on the certification document.	1 "companion" cylinder per month per plant during production, or cylinder testing machine, whichever is greater. Call Precast Inspection Engineer at 651-366-5540 for additional information.		**Form 02415 or 2403** For Concrete Pipe Both A & B: Product will be certified by producer, only spot checks are done by plant inspector. Make certain the invoice or certification document is signed and the product has the required markings. Maintain Form 2403 or 02415 in project records, showing source of materials and type and quantity used
2503 2506	3. Concrete Pipe 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.		Full Size Pipe	**See 3.A**
2501 2503 2506	3. Concrete Pipe Fine Aggregate	3126		1 quality test per month during production for A and B above.	10 kg. (25 lb.)	
2501 2503 2506	3. Concrete Pipe Coarse Aggregate	3137		1 quality test per month during production for A and B above.	10 kg. (25 lb.)	

IX. Geosynthetics, Pipe, Tile, and Precast/Prestressed Concrete (Cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2412	4. Precast/Prestressed Concrete Structures A. Reinforced Precast Box Culvert	3238	1 Air test per day (1st load), 2 cylinders per pour for positive slump concrete (1 for handling, 1 for shipping).	1 "companion" cylinder per month per plant during production, or cylinder testing machine, whichever is greater. Call Precast Inspection Engineer at 651-366-5540 for additional information.		Precast/prestressed Concrete Structure (beams, posts, etc.) will be inspected and stamped at plant. Field personnel are responsible for checking for plant inspector's stamp, for shipping/handling damage or defects, and dimensions. An inspection report will be completed by plant personnel and sent to the field personnel.
	Fine Aggregate	3126		1 quality test per month during production.	10 kg. (25 lb.)	
	Coarse Aggregate	3137		1 quality test per month during production.	10 kg. (25 lb.)	
2405	4. Precast/Prestressed Concrete Structures B. Precast/Prestressed Concrete Structure (beams, posts, etc.).	2405	1 air test per day (1st load), 2 cylinders per pour for positive slump concrete (1 for handling, 1 for shipping).	1 "companion" cylinder per month per plant during production, or cylinder testing machine, whichever is greater. Call Precast Inspection Engineer at 651-366-5540 for additional information.		Precast/prestressed Concrete Structure (beams, posts, etc.) will be inspected and stamped at plant. Field personnel are responsible for checking for plant inspector's stamp, for shipping/handling damage or defects, and dimensions. An inspection report will be completed by plant personnel and sent to the field personnel.
	Fine Aggregate	3126	Gradation: 1 per 150 m^3 (200 Cu. yd.) or fraction thereof. 1 per day of production or 3 per week, whichever is less.	1 gradation and 1 quality test per month during production from a split sample. Include producer's gradation results on sample card.	10 kg (25 lb.)	
	Coarse Aggregate	3137	Gradation: 1 per 75 m^3 (100 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 during production from a split sample. Include producer's gradation results on sample card.	10 kg (25 lb.)	

IX. Geosynthetics, Pipe, Tile, and Precast/Prestressed Concrete (Cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2506	5. Manholes and Catch Basins (Construction)	2506 3622	Field Inspection: Check for damage and defects. Check dimensions as required. Check for Producer's "Certified" stamp and signature on the certification document.			**Form 02415 or 2403** 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).
2502	6. Drain Tile (Clay or Concrete)	3276	Visual Inspection	2 samples of each size from each source		
2502 2503	7. Thermoplastic (TP) Pipe ABS and PVC	3245	Obtain Certificate of compliance. Check for approved marking printed on pipe. Field Inspect for damage or defects.			**Form 02415 or 2403** See Spec. 3245 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.
2502	8. Corrugated Polyethylene Pipe – Single wall for edge drains, etc.	3278	Check for markings (AASHTO M 252) Certificate of Compliance. Field Inspect for damage or defects.	No Laboratory tests required		**Form 02415 or 2403**
2503	9. Sewer Joint Sealing Compound	3724		One per shipment	0.5 liter (1 pt.)	
2412 2501 2503	10. Preformed Plastic Sealer for Pipe	3726 Type b		One from each source	0.3 m (1 ft)	
2412 2501 2503	11. Bituminous Mastic Joint Sealer for Pipe	3728	Visual Inspection	Sample, if questionable		

IX. Geosynthetics, Pipe, Tile, and Precast/Prestressed Concrete (Cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2105	12. EPS Geofoam	Special Provisions	Visual Inspection Check for yellow aged material, uniformity and dimensions. Weigh 1'x1'x1' cut coupon to verify density every 200 m^3 (250 yd^3)			Form 02415 or 2403
2501 2503	13. Corrugated Polyethylene Pipe – Dual Wall, 12" – 48"	3247				For Specification 3247, Corrugated Polyethylene Pipe (HDPE) manufacturing facilities are required to be reviewed yearly and in compliance with AASHTO's National Transportation Product Evaluation Program (NTPEP) for producers of AASHTO M294 HDPE pipe. To determine if a pipe manufacturing plant is qualified, click on the following link for M294 pipe. http://archive.data.ntpep.org/nap/statusReport_PlasticPipe.aspx If a plant has a compliant NTPEP audit for AASHTO M294 pipe at the time the pipe is manufactured, then the plant has met requirements. Note that a previous year's audit shall govern until NTPEP issues the next year's audit. A Certificate of Compliance shall be provided in accordance with Specification 1603.

IX. Geosynthetics, Pipe, Tile, and Precast/Prestressed Concrete (Cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes

2105
2411
2412
2501
2502
2511
2512
	14. Geotextile Fabric and Geogrid Reinforcement	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	(a) 1 per project for pipe wrap or trench lining for Permeable base designs.
				
				(b) 1 per 50,000 yd^2 (40,000 m^2) or fraction thereof of each type fabric or geogrid for all other uses.
				
				(c) Sewn seam, if required, 1 per project minimum, additional as appropriate.
				
				Small Quantity Acceptance
				• For fabric totals less than 200 yd^2 (170 m^2)
				• No sampling required
				• Use Inspection Report for Small Quantities (Form 2403)
				• Check:
				  ○ Certificate of Compliance
				  ○ Identifying label on product
				  ○ Geotextile Small Quantity Acceptance List at
				
				http://www.dot.state.mn.us/materials/aggregatedocs/gtxlist.pdf
					(a) 10 Lin. Ft. (3 m)
					
					(b) 4 yd^2 (3 m^2)*
					
					(c) 10 Lin. Ft. (3 m)**
						Certificate of Compliance shall state material identification (e.g. Propex 2002, Miragrid 8XT), and minimum average roll values (MARV) for all specified geotextile properties. MARV values must meet the Specification 3733 Types 1 through 7 requirements for the specific application. Submit copy of Certificate with material samples sent to the Materials Laboratory.
						
						Submit additional sample(s), if the manufacturer or model of geotextile or geogrid used changes during construction.
						
						Sampling shall be by random selection and no more than one sample shall be taken from an individual roll. For type 6 applications (including geogrids), submit pages of Special Provisions that list required material properties. (Type 6 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.
						
						* Do not sample first full turn of rolled product.
						** Seam sample to include approximately 3 ft (1 m) of geosynthetic material on each side of seam (in direction perpendicular to seam).

X. Brick, Stone, and Masonry Units

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2506	1. Brick A. Sewer (clay) and Building	3612 to 3615	Visual Inspection	One sample per 50,000 brick or fraction thereof	6 whole bricks	
2506	1. Brick B. Sewer (Concrete)*	3616	Visual Inspection	One sample per shipment.	6 whole bricks	* Air entrainment required. Obtain air content statement from supplier.
2506	2. Concrete Masonry Units A. For Sewer Construction	3621	Visual Inspection	One sample per shipment	6 whole units	Air entrainment required. Obtain air content statement from supplier.
2411	2. Concrete Masonry Units 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.
2422	3. Reinforced Concrete Cribbing	3661	Concrete control tests Air Tests Visual Inspection if previously tested	One cylinder per 100 units, but not less than 5 cylinders for a given contract. Other materials as required herein.	150 x 300mm (6 x 12 in) Cylinders	Form 02415 or 2403 Will be stamped when inspected prior to shipment.
2511 2512 2577	4. Stone for Masonry or Rip-Rap	3601 and Special Provisions	Visual Inspection Submit Form 02415 unless special testing is specified			Form 02415 or 2403 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.

XI. Electrical and Signal Equipment Items

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2545	1. Lighting Standards (Aluminum or Steel)	3811	Visual Inspection			The Fabricator shall submit "Certificate of Compliance", on a per project basis, to the Project Engineer..
2545 2550 2565	2. Hand Holes (Precast, PVC, and LLDPE)	2545 2550 2565				Form 02415 or 2403 Traffic signals and street lighting projects require handholes and frames and covers to be listed on the Mn/DOT Approved/Qualified Products List (A/QPL) for signal. For cast iron frame and cover: see VII.6, Drainage Castings
2545 2565	3. Foundation	2545	Slump as needed	1 cylinder per 20 m^3 (25 Cu. yd.)		Rebar is required in concrete foundations as specified in the Contract documents for all traffic signal and street lighting projects.
2402 2545 2565	4. Conduit and Fittings A. Metallic	3801 3802	Visual Inspection	None		Form 02415 or 2403 Conduit shall be labeled as being listed by a National Recognized Testing Laboratory (NRTL). Retain Form 02415 or 2403 in Project File
2545 2565	4. Conduit and Fittings B. Non-Metallic (Rigid and HDPE)	3803 Special Provisions	Visual Inspection			Form 02415 or 2403 Conduit shall be labeled as being listed by a National Recognized Testing Laboratory (NRTL). 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.
2545 2565	5a. Anchor bolts (cast in place)	2545 2565				See section VII, 7.
2545	5b. Anchorages (Drilled In)	2545				See section VII, 8.

XI. Electrical and Signal Equipment Items (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2545 2565	6. Miscellaneous Hardware	2545 2565	Visual Inspection	Sample critical items only. One of each item per shipment. (Critical Items are load bearing, structurally necessary items.)		Will carry "Inspected tag if sampled and tested prior to shipment. No sample necessary if "Inspected". Do not use if not tested. 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 Approved/Qualified Products Lists (A/QPL). The Contract documents indicate which items must be on the Signals and/or Lighting APL.
2545 2550 2565	7. Cable and Conductors A. Power Conductors Loop Detector Conductors (No Tubing)	3815.2B1 3815.2B2(a)	Visual Inspection	None		Form 02415 or 2403 Make certain the conductors are the type specified. Submit Field Inspection report showing type and quantities used. Shall be labeled as being listed by a National Recognized Testing Laboratory (NRTL) and type where applicable.
2545 2550 2565	7. Cable and Conductors 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	1 sample per size per lot	1.5m (5 ft)	**Form 02415 or 2403** Usually inspected at the distributor. Documentation showing project number, reel number(s), & Mn/DOT test number(s) will be included with each project shipment. If such documentation is not received from Contractor, submit sample for testing along with material certification from manufacturer. Do not use if not tested. Pre-inspected materials will not 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.
2545 2550 2565	7. Cable and Conductors C. Fiber Optic Cables	3815.2C13	Visual Inspection - verify make and model number as shown in Special Provisions	None		**Form 02415 or 2403** Fiber optic cables shall be listed on the Mn/DOT Approved/Qualified Products List (A/QPL) for Traffic Management Systems/ITS.

XI. Electrical and Signal Equipment Items (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2545 2565	8. Ground Rods	2545 2565	Visual Inspection	None.		**Form 02415 or 2403** Retain Form 02415 or 2403 in project file. Shall be labeled as being listed by a National Recognized Testing Laboratory (NRTL).
2545	9. Luminaires and Lamps	3810				**Form 02415 or 2403** Traffic signal and street lighting projects require luminaries and lamps to be listed on the Mn/DOT Approved/Qualified Products List (A/QPL) for Lighting. The conductors shall be labeled as being listed by a National Recognized Testing Laboratory (NRTL) and type, where applicable.
2545	10. Electrical Systems					Electrical Systems are to be reported as a "System" using the Lighting, Signal, and Traffic Recorder Inspection Report. To be certified by the Project Engineer.
2565	11. Traffic Signal Systems	2565				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.