S-1 REVISED SCHEDULE OF MATERIALS CONTROL FOR CERTIFIED READY-MIX CONCRETE PLANT PRODUCTION

NEW WRITE-UP 02/11/19 ◄DO NOT REMOVE THIS "NEW WRITE-UP" DATE. IT NEEDS TO STAY IN FOR THE CONTRACTORS.

Always use this write-up with SP2018-156 (STRUCTURAL CONCRETE).

SP2018-156.1

S-1.1 Pages 26-29 of the MnDOT SD-15 June, 2017 (Rev. Nov., 2017) Schedule of Materials Control for 2018 Standard Specifications shall be deleted and replaced with the following:

Certified Ready-Mix - Concrete Plant Production

Remarks:

(1) All gradation and quality tests require companion samples. Samples taken at location identified on Contact Report located.

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

(3) When <**20 yd³** of concrete is produced in a **week**, plant monitoring is not required with the exception of monthly aggregate quality testing.

Minimum Sample Sizes:

Gradation:	**Moisture:**	**Aggregate Quality:**
3/4" Plus, #4: 30 lb.	Fine Aggregate: 500 g	3/4" Plus, #4: 50 lb.
3/4" Minus, #67: 10 lb.	Intermediate Aggregate: 500 g	3/4" Minus, #67: 30 lb.
#7, CA-70: 6 lb.	Coarse Aggregate: 2000 g	#7, CA-70: 30 lb.
CIA, FIA: 1000 g		#89, CA-80: 30 lb.
CS, FS: 500 g		Intermediate Agg: 30 lb.
#89, CA-80: 500 g		Fine Aggregate: 30 lb.
Fine Aggregate: 500 g		
Companion Required, Double Sample Sizes		**Companion Required, Double Sample Sizes**

Pay Item No.	Test Type	Spec. No.	Producer/Contractor Testing		Agency Testing	Form No.
2301** 2302 2401 2406 2411 2452 2461 2462 2506 2511 2514 2519 2521 2531 2533 2545 2550 2554 2557 2564 2565	Gradation (QC/QA)	2461 3126 3131 3137	**All JMFs and Bridge Deck mix designs** **Daily Concrete Quantity:** **20 – 400 yd³**: 1 per fraction per source **>400 yd³**: 2 per fraction per source Take second gradation after daily total exceeds 400 yd³. Passing aggregate gradations are required prior to the start of bridge deck pours.	**All other mix designs** **Weekly Concrete Quantity:** **20 – 400 yd³**: 1 per fraction per source **>400 yd³**: 2 per fraction per source Take second gradation after weekly total exceeds 400 yd³.	**All mix designs** **Weekly Concrete Quantity ≥ 20 yd³:** 1 QA (QC Companion) sample per fraction per source per week Include QC Companion results on Sample ID Card.	QC Workbook Aggregate Gradation Control Charts Workbook
			Notes: Washing the fine aggregate gradation (QC) sample is not required when the result on the -#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. Performing testing on representative material at the end of the most recent day of production is allowed.			

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.**
2301** 2302 2401 2406 2411 2452 2461 2462 2506 2511 2514 2519 2521 2531 2533 2545 2550 2554 2557 2564 2565	Gradation (Verification/ Verification Companion)	2461 3126 3131 3137	Test the Verification Companion sample. Complete on the day the sample was taken. Wash all fine aggregate Verification Companion samples.	**Weekly Concrete Quantity ≥ 100 yd^3:** 1 per fraction per source Include Verification Companion results on Sample ID Card.	QC Workbook 24143 Weekly Certified Ready-Mix Plant Report or QA Workbook
	Aggregate Quality <u>including</u> Coarse Aggregate Percent Passing - #200	3126 3131 3137	Test at Contractor's Discretion	1 per fraction per source per month. **<u>Bridge Deck Concrete:</u>** 1 per fraction per source per month tested for 3137.2.D.2 Identify quality samples with a "Q" on the Sample ID Card and the Quality companion sample.	2410 Sample ID Card
	Aggregate Moisture (QC)	2461	**Daily Concrete Quantity ≥ 20 yd^3:** 1 per fraction per source completed every 4 hours. 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	QC Workbook

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

Concrete Pavement - Concrete Plant Production

Remarks:

(1) Use Certified Ready-Mix - Concrete Plant Production testing rates schedule when:
- a) The entire concrete paving project is < 3,500 cu. yd.
- b) A secondary plant is used to provide minor work.

(2) When w/c incentives apply:
- a) Contractor QC Technician and Agency Plant Monitor are required to be present during the entire pour. **If w/c incentives do not apply, the Agency Plant Monitor shall monitor as necessary to ensure compliance with the requirements of the Contract.**
- b) A certified ready-mix plant shall be **dedicated (provides concrete only to the concrete paving project)**.

(3) Take gradation samples in the presence of the Agency unless otherwise authorized by the Engineer. Take samples off the belt leading to the weigh hopper unless otherwise approved 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:		**Moisture:**		**Aggregate Quality:**		**-#200 Coarse Aggregate:**	
3/4" Plus, #4:	30 lb.	Fine Aggregate:	500 g	3/4" Plus, #4:	50 lb.	3/4" Plus, #4:	12 lb.
3/4" Minus, #67:	10 lb.	Intermediate Aggregate:	500 g	3/4" Minus, #67:	30 lb.	3/4" Minus, #67:	6 lb.
#7, CA-70:	6 lb.	Coarse Aggregate:	2000 g	#7, CA-70:	30 lb.	#7, CA-70:	6 lb.
CIA, FIA:	1000 g			#89, CA-80:	30 lb.	CIA, FIA:	1000 g
CS, FS:	500 g			Intermediate Agg:	30 lb.	CS, FS:	500 g
#89, CA-80:	500 g			Fine Aggregate:	30 lb.	#89, CA-80:	500 g
Fine Aggregate:	500 g						
Companion Required, Double Sample Sizes				**Companion Required, Double Sample Sizes**			

Pay Item No.	Test Type	Spec. No.	Producer/Contractor Testing		Agency Testing		Form No.
2301	Gradation (QC/QA)	3126 3131 3137	**Concrete paving batch plant:** **Daily Concrete Quantity ≥ 250 yd³:** 1 per 2500 yd³ per fraction per source Take initial samples for aggregate gradation testing within the first 250 yd³.	**Certified ready-mix plant:** **Daily Concrete Quantity:** **20 – 400 yd³**: 1 per fraction per source **>400 yd³**: 2 per fraction per source Take second gradation after daily total exceeds 400 yd³.	**Concrete paving batch plant:** **Daily Concrete Quantity ≥ 100 yd³:** 1 QA (QC Companion) sample per fraction per source per week	**Certified ready-mix plant:** **Weekly Concrete Quantity ≥ 20 yd³:** 1 QA (QC Companion) sample per fraction per source per week	JMF Concrete Aggregate Workbook JMF Moving Average Summary Workbook 2410 Sample ID

<table>
<tr><td></td><td></td><td></td><td>Performing testing on representative material at the end of the most recent day of production is allowed.

If well-graded aggregate incentives apply:
Use the Contractor’s gradation results for well-graded aggregate incentive calculations as verified by Agency testing</td><td colspan="2">Include the JMF Number and the QC Gradation/Verification Companion results on the Sample ID Card.</td><td rowspan="3">Card when samples are submitted to MnDOT Laboratory</td></tr>
<tr><td rowspan="2">2301</td><td rowspan="2">Gradation (Verification/ Verification Companion)</td><td rowspan="2">3126
3131
3137</td><td rowspan="2">Test the Verification Companion sample. Complete on the day the sample was taken.</td><td><u>Concrete paving batch plant:</u>

Daily Concrete Quantity ≥ 250 yd^3:

1 per fraction per source per <u>day</u></td><td><u>Certified ready-mix plant:</u>

Weekly Concrete Quantity ≥ 100 yd^3:

If well-graded aggregate incentives apply:
1 per fraction per source per <u>day</u>

If well-graded aggregate incentives do not apply:
1 per fraction per source per <u>week</u></td></tr>
<tr><td colspan="2">Include the JMF Number and the QC Gradation/ Verification Companion results on the Sample ID Card.

If Coarse Aggregate Quality Incentive/Disincentives apply:
The Agency may use the Verification gradation sample for the Coarse Aggregate Quality incentive/disincentive testing.</td></tr>
</table>

S-1.2 The following shall be added to the bottom of the Table on Page 35 of the MnDOT SD-15 June, 2017 (Rev. Nov., 2017) Schedule of Materials Control for 2018 Standard Specifications:

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

2301 2521	Colored Concrete Membrane Curing Compound	3752	Visual Inspection	Only curing compound for colored concrete from qualified sources is allowed. Refer to the approved products list of curing compounds for qualified manufacturers **www.dot.state.mn.us/products**.

S-1.3 Page 39 of the MnDOT SD-15 June, 2017 (Rev. Nov., 2017) Schedule of Materials Control for 2018 Standard Specifications shall be deleted and replaced with the following:

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

Concrete Field Testing – Concrete Pavement (cont.)					
Pay Item No.	**Test Type**	**Spec. No.**	**Contractor Testing**	**Agency Testing**	**Form No.**
2301	Concrete Pavement Texture	2301	Perform texture testing at locations determined by the Engineer in accordance with the Contract.	Determine texture testing locations using random numbers. Observe Contractor testing when possible.	Probing Coring Texture and MIT-SCAN T2 Report
2301	Thickness (QC/Verification)	2301	Probe and core at locations determined by the Engineer in accordance with the Contract.	Initial pavement at core locations and re-initial the sides of specimens after coring. Field measure to the nearest 1/8” Transport to the MnDOT Office of Materials and Road Research for final thickness determination.	Probing Coring Texture and MIT-SCAN T2 Report Field Probing Report Field Coring Report
2301	Surface Smoothness	2399	Measure smoothness of the final concrete as required by the Contract. Perform all profiling in the presence of the Engineer unless otherwise approved by the Engineer.	Observe Contractor testing when possible.	Concrete Profile Summary Worksheet
2301	Dowel Bar and Tie Bar Steel Location	2301	For concrete projects greater than 3,500 cu. yd. On the first day and each day of slip form pavement placement: (1) Verify the adequacy of the dowel bar anchoring by scanning seven (7) random doweled contraction joints in each sublot. (2) Verify the presence and alignment of tie bar steel by scanning 75 lin. ft. in each sublot. If the Engineer determines the first days dowel bar anchoring and tie bar placement processes are acceptable, the Engineer may allow a reduction in scanned joints in each sublot as follows: (1) Verify the adequacy of the dowel bar anchoring by scanning four (4) random doweled contraction joints per sublot. (2) Verify the presence and alignment of tie bar steel by scanning 25 lin. ft. out of every sublot.	Observe Contractor steel location testing when possible.	Probing Coring Texture and MIT-SCAN T2 Report