Materials Sampling Guide







NEBRASKA

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DEPARTMENT OF TRANSPORTATION

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Section 1

General Instructions and Definitions

General Instructions

1) When the sample or testing requirements of a material mentioned in this Materials Sampling Guide differs from those previously listed in our various field manuals, the Materials Sampling Guide will take precedence.

2) The Materials & Research Division pre-approves several materials before they reach the jobsite. When approved or pre-tested stock arrives on the project, certain requirements must be complied with before the material can be used. These requirements are stipulated in this guide.

3) The Materials & Research Division will be notified immediately of any substandard material arriving on a project.

4) It is recognized that in ordinary construction, some tests and observations may not comply with specification requirements. All test results obtained will be reported. The project manager will identify what action was taken regarding materials not meeting specification requirements. This disposition will include reasons for use of material, corrective action taken or reference to a check sample.

General Definitions

Minimum Materials Certificate, Sample and Inspection Requirements:

- Q.C. Testing by Contractor – Contractor performs testing to control the quality of the material.

- Verification Sampling and Testing by NDOT – Nebraska Department of Transportation personnel perform verification testing to correlate with contractor's test results and/or to verify the quality of material for acceptance.

- Independent Assurance Testing – Nebraska Department of Transportation, Contractor, Consultant personnel, equipment and laboratories are evaluated on an annual basis. This evaluation will determine the testing personnel's competence performing their job. The evaluation will also assure that all equipment and testing facilities meet specification requirements.

The descriptions listed above are a very brief synopsis of the Quality Assurance Program for Construction. The Quality Assurance Program for Construction manual is found in this sampling guide. Please refer to it for a more in-depth description of the program.

Instructions for Local Public Agency (LPA) Projects

The Materials Sampling Guide is written to define roles and responsibilities for field, branch, and central laboratory personnel who sample or test on an NDOT project. On LPA projects, the LPA/Consultant Construction Engineering (CE) agreement defines who will fill each of the roles required by the Sampling Guide. All LPA/Consultant CE agreements are saved in the project file under the Local Project Divisions Environment in OnBase.

The LPA/Consultant CE agreement will define the following:

1) Field Personnel –The certified consultant or LPA field inspector/s assigned

2) Central Laboratory – Dependent on the material and agreement, this will be conducted by the NDOT Central Laboratory, or a NDOT qualified consultant or LPA laboratory.

3) Branch Laboratory – Dependent on the material and agreement, this will be conducted by the NDOT Central Laboratory or a NDOT qualified consultant or LPA laboratory.

4) Sample Required – It is the responsibility of the inspecting agency to determine which laboratory (NDOT Central, NDOT Branch, or NDOT qualified consultant or LPA) will perform the testing on a specific material. This responsibility extends to obtaining and delivering the sample to the appropriate laboratory.

Technician Requirements

- Certification:

  All consultant and LPA field inspection personnel and laboratory technicians must be certified to test and sample the materials for which they are responsible. Refer to Section 28 of the sampling guide for more information about the applicability of the Quality Assurance Program and technician certification requirements. The list of certified technicians is maintained in AASHTOWare Project (AWP).

- Independent Assurance:

  All consultant and LPA field inspection personnel and laboratory technicians who sample and test for an LPA project on the NHS are required to have an annual IA conducted by an NDOT QA Manager or designee.

Qualified Laboratory Requirements

All consultant and LPA laboratories must be pre-qualified by NDOT to conduct the testing in the CE agreement. A list of NDOT qualified laboratories and the tests they are qualified to perform is maintained on the NDOT Materials & Research website.

NOTE: The NDOT Laboratory Qualification Manual is located on the Materials & Research Division’s website and defines requirements that must be met to become an NDOT qualified laboratory.

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MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 2 – Asphaltic Materials			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
1) Asphaltic Oils	Quality	- - - - - - - - - -	Using a one-quart can, submit a one-quart sample per project, per type, for each supplier.	- - - - - - - - - -	Acceptance samples to be tested in the central laboratory.	Section 27 Note 1 Note 2
2) Asphalt, Emulsified Anionic and Cationic	Quality	- - - - - - - - - -	One sample for each item/type of emulsion on project for each supplier. Inspector chooses <u>any time within the project</u> to get one sample. Samples diluted with water will be identified and the percentage of dilution disclosed.	- - - - - - - - - -	Acceptance samples to be tested in the central laboratory.	Section 27 Note 1 Note 2
3) Perform-ance Graded Binder	Quality	- - - - - - - - - -	Using one two-quart can, submit a two-quart sample for each lot (200 liquid binder tons), or final portion thereof, of each performance grade of binder for each supplier.	- - - - - - - - - -	Acceptance samples to be tested in the central laboratory.	Section 27 Note 2

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MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 3 – Asphaltic Concrete			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
1) Asphaltic Concrete Type LC-S, SRM, SPR, SLX, and SLX Super-Mod	Air Void Binder % FAA CAA Gradation	Normally one per 1,000 ton sub-lot. If, at the completion of the project, the final lot consists of less than one full lot of asphaltic concrete, 1 sample for each sublot or fraction thereof, shall be taken and tested.	Ensure a sample for each 1,000 ton sub-lot is retained for branch laboratory testing.	One sample representing a 1,000 ton sub-lot will be tested for each 5,000 ton lot.	Testing and sampling for verification testing and dispute resolution as needed.	Section 27 Note 3
	Tensile Strength Ratio (TSR) T-283	- - - - - - - - - -	A sample consisting of six specimens is required from the first lot of field production and randomly selected lots thereafter. Additional samples if requested by the Materials & Research Division.	- - - - - - - - - -	Testing for lot field production.	Section 27 Note 3
2) Asphaltic Concrete Type SPS	Air Void Gradation Binder %	Normally one per 1,000 ton sub-lot If, at the completion of the project, the final lot consists of less than one full lot of asphaltic concrete, 1 sample for each sublot or fraction thereof, shall be taken and tested.	Ensure a sample for each 1,000 ton sub-lot is retained for branch laboratory testing.	One sample representing a 1,000 ton sub-lot will be tested for each 5,000 ton lot.	Testing and sampling for verification testing and dispute resolution as needed.	Section 27 Note 3
3) Asphaltic Concrete Mixtures	Density	Normally one per 1,000 ton sub-lot If, at the completion of the project, the final lot consists of less than one full lot of asphaltic concrete, refer to the specifications for partial lots.	See specifications, supplemental specifications and/or project special provisions.	Testing and sampling for verification testing and dispute resolution as needed.	Testing and sampling only for dispute resolution.	Section 27 Note 28

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 3 – Asphaltic Concrete (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
4) Asphaltic Concrete Pavement	Surface Smoothness	Contractor performs all QC pavement smoothness testing specified in the NDOT Standard Specifications for Highway Construction and/or project special provisions.	Approximately 10 percent of contractor's results may be randomly verified. Project personnel will submit requests for pavement smoothness verification testing to the Materials & Research Division Submit requests at least 7 days in advance to allow for scheduling.	----------	----------	----------
5) Warm Mix Asphalt (Chemical Additives)	----------	Yes	No	No	No	---------

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MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 4 – Asphaltic Concrete Materials			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
1) Mineral Aggregate (Gravel, Sand, Sand-Gravel)	Quality	- - - - - - - - - -	Project personnel will supply the 60-pound sample when needed to perform the testing shown under the central laboratory column. The sample shall be taken at the project stockpile.	- - - - - - - - - -	One 60-pound sample for quality tests for source approval, if so designated by the Aggregate Laboratory Manager. No other samples for quality or verification are needed.	Section 27 Note 4
2) Crushed Rock (Limestone)	Quality	- - - - - - - - - -	Project personnel will supply the 60-pound sample needed to perform the testing shown under the central laboratory column. The sample shall be taken at the project stockpile.	- - - - - - - - - -	One 60-pound sample for quality tests for 5,000 tons of aggregate used or fraction thereof.	- - - - - - - - - -
3) Crushed Rock (Limestone Screenings, Man-Sand)	Quality	- - - - - - - - - -	Project personnel will supply the 60-pound sample needed to perform the testing shown under the central laboratory column. The sample shall be taken at the project stockpile.	- - - - - - - - - -	One 60-pound sample for quality tests for each 5,000 tons of aggregate used or fraction thereof.	- - - - - - - - - -

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 4 – Asphaltic Concrete Materials (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
4) Quartzite and Granite	Quality	- - - - - - - - - -	Project personnel will supply the 60-pound sample needed to perform the testing shown under the central laboratory column. The sample shall be taken at the project stockpile.	- - - - - - - - - -	One 60-pound sample for quality tests each 5,000 tons of aggregate used or fraction thereof.	- - - - - - - - - -
5) Quartzite, Chat and Granite (Screenings, Man-Sand)	Quality	- - - - - - - - - -	Project personnel will supply the 60-pound sample needed to perform the testing shown under the central laboratory column. The sample shall be taken at the project stockpile.	- - - - - - - - - -	One 60-pound sample for quality tests for each 5,000 tons of aggregate used or fraction thereof.	- - - - - - - - - -
6) Crushed Mineral Aggregate or Chat for Micro-surfacing	Quality & Gradation, FAA, L.A. and Sand Equivalent	- - - - - - - - - -	One sample for gradations every 500 tons of material used or fraction thereof. Project personnel will provide the 10- and 60-pound samples needed to perform the testing shown under the Central Lab column. The sample shall be taken at the project.	- - - - - - - - - -	One 60-pound sample for first 1,000 tons of aggregate used. Subsequent samples will be one 10-pound sample for each 1,000 tons used, or fraction thereof (Duplicate of sample tested in the field).	Section 27 Note 4

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 4 – Asphaltic Concrete Materials			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
7) Mineral Filler	Plasticity Index & Gradation	- - - - - - - - - -	Project personnel will supply the 10-pound sample needed to perform the testing shown under the central laboratory column. The sample shall be taken at the project.	- - - - - - - - - -	One 10-pound sample per project at production for gradation and plasticity index, unless changes in quality or characteristics occur.	- - - - - - - - - -

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MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 5 – Cold Mix Bituminous Surfacing, Base, and Cold Recycled Bituminous			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
1) Subgrade Sand	Gradation	- - - - - - - - - -	One sample for gradation test each 10th station. Project personnel will supply the 10-pound sample needed to perform the testing shown under the central laboratory column. The samples shall be taken at the project.	- - - - - - - - - -	One 10-pound sample for gradation test each mile (Duplicate of sample tested in the field).	Section 27 Note 28
2) Mineral Filler	Plasticity Index & Gradation	- - - - - - - - - -	One sample for gradation test each 100 cubic yards or fraction thereof. The sample shall be taken at the project. Project personnel will supply the 10-pound sample needed to perform the testing shown under the central laboratory column. The samples shall be taken at the project.	- - - - - - - - - -	One 10-pound pre-construction sample per project for gradation and plasticity index.	Section 27 Note 28

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
SECTION 5 – Cold Mix Bituminous Surfacing, Base, and Cold Recycled Bituminous (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	.
3) Combined Materials (Sand and Filler)	Gradation & Moisture	- - - - - - - - - -	One sample for gradation and moisture each 10th station or in cases of short sections project manager to determine sampling for compliance. Project personnel will supply the 10-pound sample needed to perform the testing shown under the central laboratory column. The sample shall be taken at the project.	- - - - - - - - - -	One 10-pound sample for gradation test each mile (duplicate of sample tested in the field).	Section 27 Note 28
4) Bituminous Aggregates (Includes Mixed-in-Place Bituminous Surfacing)	Quality	- - - - - - - - - -	One test for moisture and aeration as soon as each design section is well mixed. Then test as necessary to control moisture and aeration. The sample shall be taken at the project. Project personnel will supply the 1-gallon samples needed to perform the testing shown under the branch laboratory column.	One 1-gallon sample for progressive and other tests as soon as each design section is well mixed. Followed by one 1-gallon sample for verification tests each 2,000 feet of windrow, or at the discretion of the project manager, as laid (submitted sample will be a duplicate of the sample tested in the field).	- - - - - - - - - -	Section 27 Note 1 Note 28

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
SECTION 5 – Cold Mix Bituminous Surfacing, Base, and Cold Recycled Bituminous (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
5) Mineral Aggregates	Experimental Bituminous Mixture	- - - - - - - - - -	Project personnel will supply the 60-pound sample needed to perform the testing shown under the central laboratory column.	- - - - - - - - - -	- - - - - - - - - -	Section 27 Note 4
6) Mineral Filler	Experimental Bituminous Mixture	- - - - - - - - - -	Project personnel will supply the 40-pound sample needed to perform the testing shown under the central laboratory column.	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
SECTION 5 – Cold Mix Bituminous Surfacing, Base, and Cold Recycled Bituminous (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
7) Cement Stabilized Bituminous	Moisture Deflection/ Moisture Density	- - - - - - - - - -	In-place moisture deflection or moisture density tests every 1,500 square yards or fraction thereof, or in cases of short sections, test to confirm the project manager's judgment on compliance with specification requirements.	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
	Mix Design	The contractor shall core asphalt surface and supply one 120-pound sample of asphalt and one 20-pound sample of underlying soil to perform the testing shown under the central laboratory column. When the highway plans show varying depths of stabilized bituminous, a separate mix design is required for each unique depth of stabilization. The contractor will provide the samples to project personnel. Samples required 21 days prior to construction.	Project personnel will be present during asphalt coring of the roadway. Project personnel will transport the sampled material.	- - - - - - - - - -	One 120-pound sample of asphalt and one 20-pound sample of underlying soil for verification testing and mix design.	Section 29 Policy 4
	Portland Cement	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	Please refer to the Nebraska Qualified Material Vendors List for approved suppliers.

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
SECTION 5 – Cold Mix Bituminous Surfacing, Base, and Cold Recycled Bituminous (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
8) Fly Ash Stabilized Bituminous	Moisture Deflection/ Moisture Density	- - - - - - - - - -	In-place moisture deflection or moisture density tests every 1,500 square yards or fraction thereof, or in cases of short sections, test to confirm the project manager's judgment on compliance with specification requirements.	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
	Mix Design	The contractor shall core asphalt surface and supply one 120-pound sample of asphalt, one 20-pound sample of underlying soil, and one 20-pound sample of fly ash to perform the testing shown under the central laboratory column. When the highway plans show varying depths of stabilized bituminous, a separate mix design is required for each unique depth of stabilization. The contractor will provide the samples to project personnel. Samples required 21 days prior to construction.	Project personnel will be present during asphalt coring of the roadway. Project personnel will transport the sampled material.	- - - - - - - - - -	One 120-pound sample of asphalt, one 20-pound sample of underlying soil, and one 20-pound sample of fly ash for verification testing and mix design.	- - - - - - - - - -
	Fly Ash	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	Section 10 Fly Ash

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
SECTION 5 – Cold Mix Bituminous Surfacing, Base, and Cold Recycled Bituminous (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
9) Cold-in-Place Recycled with Foam	Moisture Deflection/ Moisture Density	- - - - - - - - - -	In-place moisture deflection or moisture density tests every 1,500 square yards or fraction thereof, or in cases of short sections, test to confirm the project manager's judgment on compliance with specification requirements.	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
	Mix Design	Contractor shall core the roadway and supply 500 pounds of asphalt and a quantity of PG Binder from the project at a quantity recommended by the laboratory doing the testing. The laboratory shall be an independent laboratory familiar with Cold in Place recycling mix designs, it shall provide a mix design meeting the requirements of the specification.	Project personnel will be present during asphalt coring of the roadway. Project personnel will transport the sampled material.	- - - - - - - - - -	Binder acceptance samples to be tested in the central laboratory.	Section 2 Performance Graded Binder

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
SECTION 5 – Cold Mix Bituminous Surfacing, Base, and Cold Recycled Bituminous (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
10) Hydrated Lime Slurry Stabilization	Deflection/ Density	- - - - - - - - - -	In-place deflection or density tests every 1,500 square yards or fraction thereof, or in cases of short sections, test to confirm the project manager's judgment on compliance with specification requirements.	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
	Mix Design	Contractor shall core the roadway and supply 500 pounds of asphalt and a quantity of asphalt emulsion and pebble lime from the project at a quantity recommended by the lab doing the testing The laboratory shall be an independent lab familiar with Hydrated Lime recycling mix designs, it shall provide a mix design meeting the requirements of the specification.	Project personnel will be present during asphalt coring of the roadway.	- - - - - - - - - -	Emulsion acceptance samples to be tested in the central laboratory.	Section 2 Asphalt, Emulsified Anionic and Cationic Section 10 Hydrated Lime or Pebble Quicklime

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MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
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Section 6 – Gravel and Crushed Rock for Surfacing			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
1) Gravel for Surfacing	Quality & Gradation	- - - - - - - - - -	One sample for each 500 ton or fraction thereof, at the project. Project personnel will provide the 10- and 60-pound samples when needed to perform the testing shown under the central laboratory column. Project personnel will supply the 10- and 60-pound samples needed to perform the testing shown under the central laboratory column. The sample shall be taken at the project.	- - - - - - - - - -	One 60-pound sample for quality tests from the first 2,500 ton, if so designated by the Aggregate Laboratory Manager. One 10-pound sample for gradation test each 2,500 ton or fraction thereof (Duplicate of sample tested in the field) NOTE: A central laboratory sample is required on all projects. If the Aggregate Laboratory Manager determines a 60-pound quality sample is not needed, field personnel must still submit a 10-pound sample.	Section 27 Note 1 Note 4 Note 28

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 6 – Gravel and Crushed Rock for Surfacing			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
2) Crushed Rock for Surfacing	Quality & Gradation	- - - - - - - - - -	One sample for each 1,000 ton or fraction thereof, at the project. Project personnel will provide the 60-pound sample needed to perform the testing shown under the central laboratory column. Project personnel will supply the 60-pound sample needed to perform the testing shown under the central laboratory column. The sample shall be taken at the project.	- - - - - - - - - -	No samples required if source is Kerford or Martin Marietta @ Weeping Water or Martin Marietta @ Fort Calhoun. One 60-pound sample is required for each 4,000 ton or fraction thereof, from all other sources.	Section 27 Note 1 Note 28

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Section 7
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MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 7 – Mineral Aggregate for Armor Coat			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
1) Mineral Aggregate for Armor Coat (Gravel)	Quality & Gradation	- - - - - - - - - -	One sample for gradation test each 250 cubic yards or fraction thereof. Project personnel will provide the 10- and 60-pound samples when needed to perform the testing shown under the central laboratory column. The samples shall be taken at the project.	- - - - - - - - -	One 60-pound sample for quality tests from the first 1,000 cubic yards, if so designated by the Aggregate Laboratory Manager. One 10-pound sample for gradation tests each 1,500 cubic yards or fraction thereof (Duplicate of sample tested in the field). NOTE: A central laboratory sample is required on all projects. If the Aggregate Laboratory Manager determines a 60-pound quality sample is not needed, field personnel must still submit a 10-pound sample.	Section 27 Note 4 Note 28

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 7 – Mineral Aggregate for Armor Coat			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
2) Chip Seal (Limestone, Dolomite, Granite, Quartzite)	Quality & Gradation	- - - - - - - - - -	One sample for gradation test each 250 cubic yards or fraction thereof. Project personnel will provide the 10- and 60-pound samples when needed to perform the testing shown under the central laboratory column. The samples shall be taken at the project	- - - - - - - - -	One 60-pound sample for quality tests first 1,000 cubic yards. If so designated by the Aggregate Laboratory Manager. One 10-pound sample for gradation tests each 1,500 cubic yards or fraction thereof (Duplicate of sample tested in the field).	Section 27 Note 4 Note 28

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 7 – Mineral Aggregate for Armor Coat			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
3) Light-weight Aggregate	Quality & Gradation	- - - - - - - - - -	One sample for gradation test each 250 cubic yards or fraction thereof. Project personnel will provide the 10- and 60-pound samples when needed to perform the testing shown under the central laboratory column. The samples shall be taken at the project.	- - - - - - - - -	One 60-pound sample for quality tests first 1,000 cubic yards. If so designated by the Aggregate Laboratory Manager. One 10-pound sample for gradation tests each 1,500 cubic yards or fraction thereof (Duplicate of sample tested in the field). NOTE: A central laboratory sample is required on all projects. If the Aggregate Laboratory manager determines a 60-pound quality sample is not needed field personnel, must still submit a 10-pound sample.	Section 27 Note 4 Note 28

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Section 8
Crushed Rock for Base Course

1. Crushed Rock for Base Course – Quality and Gradation 8-1

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 8 – Crushed Rock for Base Course			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
1) Crushed Rock for Base Course	Quality, and Gradation	- - - - - - - - - -	One sample for gradation testing, each 1,500 ton or fraction thereof. (The approximate sample size for field performed gradation testing should consist of a 25-pound sample for crushed rock for base course and a 10-pound sample for crushed rock screenings for base course) Additional samples should be taken at the discretion of the project manager to confirm that segregation, degradation or contamination of the material has not occurred prior to incorporation in to the work. Project personnel will supply the 60-pound sample needed to perform the testing shown under the central laboratory column. The samples shall be taken at the project.	- - - - - - - - - -	One 60-pound sample for quality and gradation tests each 4,500 ton or fraction thereof. This will be a duplicate of sample tested in the field.	Section 27 Note 28

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Section 9
Grading

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2. **Excavation (Earth Fill) – Moisture Deflection/Moisture Density 9-3**

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 9 – Grading			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
1) Embank-ment (Cohesive and Granular)	Moisture Deflection/ Moisture Density	- - - - - - - - - -	In-place moisture deflection or moisture density tests every 1,500 cubic yards or fraction thereof for each lift of fill, depending on the soil type or as needed is indicated by changes in soil material. In cases of structure backfill, short deep embankments, or other special situations, the sampling frequency should be increased as determined by the project manager to adequately represent the soil material. If tested layer is disturbed by construction operations, rain, etc., re-tests shall be taken to assure compliance with specifications prior to subsequent construction. Project personnel to supply the sample needed to perform the testing shown under the branch/central laboratory column. Sample required 14 days prior to construction	Index tests and/or compaction curve data usually will be furnished by the Materials & Research Division. In those cases where these are not available, large samples (approximately 10 pounds for index tests and 60 pounds for compaction curves) shall be submitted to the central laboratory or branch laboratory by project personnel.	Index tests and/or compaction curve data usually will be furnished by the Materials & Research Division. In those cases where these are not available, large samples (approximately 10 pounds for index tests and 60 pounds for compaction curves) shall be submitted to the central laboratory or branch laboratory by project personnel.	Section 27 Note 28
Laboratory samples must be submitted in a canvas bag or a clean 5-gallon bucket with lid.						

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 9 – Grading			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
1) Embank-ment (Cohesive and Granular), cont.	Gradation (If Specified)	- - - - - - - - - -	One sample every 500 cubic yards or fraction thereof for each lift of fill depending on the soil type, or as need is indicated by changes in soil material. In cases of short sections or structure backfill, each section should be represented by tests to adequately represent the material in the fill. Project personnel to supply the samples needed to perform the testing shown under the branch/central laboratory column.	One 10-pound sample for gradation each 2,500 cubic yards or fraction thereof (Duplicate of sample tested in the field).	One 10-pound sample for gradation each 2,500 cubic yards or fraction thereof (Duplicate of sample tested in the field).	Section 27 Note 28
Laboratory samples must be submitted in a canvas bag or a clean 5-gallon bucket with lid.						

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 9 – Grading			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
2) Excavation (Earth Fill)	Moisture Deflection/ Moisture Density	- - - - - - - - - -	In-place moisture deflection or moisture density tests every 1,500 cubic yards or fraction thereof for each lift of fill, depending on the soil type or as needed is indicated by changes in soil material. In cases of structure backfill, short deep embankments, or other special situations, the sampling frequency should be increased as determined by the project manager to adequately represent the soil material. If tested layer is disturbed by construction operations, rain, etc., re-tests shall be taken to assure compliance with specifications prior to subsequent construction. Project personnel to supply the sample needed to perform the testing shown under the branch/central laboratory column. Samples required 14 days prior to construction	Index tests and/or compaction curve data usually will be furnished by the Materials & Research Division. In those cases where these are not available, large samples (approximately 10 pounds for index tests and 60 pounds for compaction curves) shall be submitted to the central laboratory or branch laboratory by project personnel.	Index tests and/or compaction curve data usually will be furnished by the Materials & Research Division. In those cases where these are not available, large samples (approximately 10 pounds for index tests and 60 pounds for compaction curves) shall be submitted to the central laboratory or branch laboratory by project personnel.	Section 27 Note 28
Laboratory samples must be submitted in a canvas bag or a clean 5-gallon bucket with lid.						

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MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 10 – Compaction – Subgrade (Cohesive Soils)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
1) Subgrade Preparation	Moisture Deflection/ Moisture Density	- - - - - - - - - -	In-place moisture deflection or moisture density tests every 1,500 square yards or fraction thereof, or in cases of short sections, test to confirm the project manager's judgment on compliance with specification requirements. Also, each soil type and/or source should be tested. For widening, test every 1,500 square yards or fraction thereof, per side. For each shoulder, test 750 square yards. If tested layer is disturbed by construction operations, rain etc., re-tests shall be taken to assure compliance with specifications prior to subsequent construction. Tests should also be taken at bridge ends, railroad crossings, project ends, county road intersections, driveways, patches etc., to confirm project manager's judgment on compliance with specifications. Project personnel to supply the sample needed to perform the testing shown under the branch/central laboratory column. Sample required 14 days prior to construction	Index tests and/or compaction curve data usually will be furnished by the Materials & Research Division. In those cases where these are not available, large samples (approximately 10 pounds for index tests and 60 pounds for compaction curves) shall be submitted to the central laboratory or the branch laboratory by project personnel.	Index tests and/or compaction curve data usually will be furnished by the Materials & Research Division. In those cases where these are not available, large samples (approximately 10 pounds for index tests and 60 pounds for compaction curves) shall be submitted to the central laboratory or branch laboratory by project personnel.	- - - - - - - - - -
Laboratory samples must be submitted in a canvas bag or clean 5-gallon bucket with lid.						

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 10 – Compaction – Subgrade (Cohesive Soils)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
2) Stabilized Subgrade - Type Cement	Moisture Deflection/ Moisture Density	- - - - - - - - - -	Project personnel will supply one 150 pound sample of subgrade soil and a 15-pound sample of cementitious material (Portland cement sample submitted upon request) to perform the testing shown under the central laboratory column. Samples required 21 days prior to construction. Also, each soil type and/or source should be tested. For in-place moisture deflection or moisture density tests, reference Subgrade Preparation-Field Personnel for testing requirements.	- - - - - - - - - -	One 150-pound sample of subgrade soil and one 15-pound sample of cementitious material (Portland cement available at the central lab) for verification testing and mix design.	- - - - - - - - - -

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 10 – Compaction – Subgrade (Cohesive Soils)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
3) Stabilized Subgrade - Type Fly Ash	Moisture Deflection/ Moisture Density/Quality	- - - - - - - - - -	Project personnel will supply one 150 pound sample of subgrade soil and a 15-pound sample of cementitious material (Fly Ash sample is required) to perform the testing shown under the central laboratory column. Samples required 21 days prior to construction. Also, each soil type and/or source should be tested. For in-place moisture deflection or moisture density tests, reference Subgrade Preparation-Field Personnel for testing requirements.	- - - - - - - - - -	One 150-pound sample of subgrade soil and one 15-pound sample of Fly Ash is required for verification testing and mix design.	- - - - - - - - - -
3a) Fly Ash	Quality	- - - - - - - - - -	Project personnel will supply one 1-pound sample for each 1,000 tons per supplier (minimum of three samples per project and a new sample for each construction season) of material used to perform the testing shown under the central laboratory column.	- - - - - - - - - -	One 1-pound sample for each 1,000 tons (minimum of three samples per project and a new sample for each construction season) of material used for acceptance testing.	Section 27 Note 28
Laboratory samples must be submitted in a canvas bag or clean 5-gallon bucket with lid.						

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 10 – Compaction – Subgrade (Cohesive Soils)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
4) Stabilized Subgrade - Type Lime	Moisture Deflection/ Moisture Density/Quality	- - - - - - - - - -	Project personnel will supply a 150-pound sample of subgrade soil and a 5-pound sample of lime to perform the testing shown under the central laboratory column. (Place the lime in a plastic bag before putting in the cloth sample bags). Samples required 21 days prior to construction. Also, each soil type and/or source should be tested. For in-place moisture deflection or moisture density tests, reference Subgrade Preparation-Field Personnel for testing requirements.	- - - - - - - - - -	One 150-pound sample of subgrade soil and one 5-pound sample of lime to perform the testing for mix design.	- - - - - - - - - -
4a) Hydrated Lime or Pebble Quicklime	Quality	- - - - - - - - - -	Project personnel will supply one 1-pound sample for each 1,000 tons per supplier (minimum of three samples per project and a new sample for each construction season) of material used to perform the testing shown under the central laboratory column. (Place the lime in a plastic bag before putting in the cloth sample bags).	- - - - - - - - - -	One 1-pound sample for each 1,000 tons (minimum of three samples per project and a new sample for each construction season) of material used for quality tests.	Section 27 Note 28
Laboratory samples must be submitted in a canvas bag or clean 5-gallon bucket with lid.						

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2. **Granular and Cohesive Material for Mix Design……11-2**

3. **Soil Binder – Gradation & Plasticity Index 11-3**

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 11 – Compaction Stabilized Portion of Granular Subgrade			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
1) Stabilized Portion of Granular Subgrade	Moisture Deflection/ Moisture Density	- - - - - - - - - -	In-place moisture deflection and moisture density tests every 1,500 square yards or fraction thereof, or in cases of short sections, test to confirm the project manager's judgment of compliance with specification requirements. If tested layer is disturbed by construction operations, rain, etc. re-tests shall be taken to assure compliance with specifications prior to subsequent construction. Project personnel will supply the samples needed to perform the testing shown under the central laboratory/branch laboratory columns. Samples to be taken in the field.	One 60-pound sample of the granular material and one 20-pound sample of the soil binder, or one 60-pound sample of the combined mixture shall be submitted to the central or branch laboratory for index and/or compaction curve data.	One 60-pound sample of the granular material and one 20-pound sample of the soil binder, or one 60-pound sample of the combined mixture shall be submitted to the central or branch laboratory for index and/or compaction curve data.	Section 27 Note 28
Laboratory samples must be submitted in a canvas bag or a clean 5-gallon bucket with lid.						

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 11 – Compaction Stabilized Portion of Granular Subgrade (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
1) Stabilized Portion of Granular Subgrade, cont.	Quality & Gradation (If Specified)	- - - - - - - - - -	One sample every 1,500 square yards or fraction thereof for gradation, or in cases of short sections, each should be represented by tests to adequately represent the material in the fill. Project personnel will supply the 10-pound sample needed to perform the testing shown under the central laboratory/branch laboratory columns. Samples to be taken in the field. Also, each soil type and/or source should be tested.	One 10-pound sample for gradation tests every 5,000 square yards or fraction thereof (Duplicate of sample tested in the field). This sample to be submitted to the branch laboratory or the central laboratory.	One 10-pound sample for gradation tests every 5,000 square yards or fraction thereof (Duplicate of sample tested in the field). This sample to be submitted to the branch laboratory or the central laboratory.	Section 27 Note 28
2) Granular and Cohesive Material for Mix Design	Quality	- - - - - - - - - -	Project personnel will supply one 150-pound sample of granular soil and a 50-pound sample of cohesive soil to perform the testing shown under the central laboratory column. Mix Design Samples required 21 days prior to construction. Also, each soil type and/or source should be tested.	- - - - - - - - - -	One 150-pound sample of granular soil and a 50-pound sample of cohesive soil for verification testing and mix design.	- - - - - - - - - -
Laboratory samples must be submitted in a canvas bag or a clean 5-gallon bucket with lid.						

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 11 – Compaction Stabilized Portion of Granular Subgrade (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
3) Soil Binder	Gradation & Plasticity Index	- - - - - - - - - -	One sample for gradation tests each 50 cubic yards or fraction thereof. If less than 10 percent retained on the No. 200 sieve, one sample for each 200 cubic yards of fraction thereof. Project personnel will supply the 10-pound sample needed to perform the testing shown under the branch laboratory/central laboratory column. Sample to be taken at the project.	One 10-pound sample for gradation tests (lab to run PI) each 1,000 cubic yards or fraction thereof (Duplicate of sample tested in the field). This sample to be submitted to the branch laboratory or the central laboratory	One 10-pound sample for gradation tests (lab to run PI) each 1,000 cubic yards, or fraction thereof (Duplicate of sample tested in the field). This sample to be submitted to the branch laboratory or the central laboratory	Section 27 Note 28
Laboratory samples must be submitted in a canvas bag or a clean 5-gallon bucket with lid.						

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MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 12 – Foundation Course (Crushed Concrete, Bituminous, Aggregate-D, Crushed Rock)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
1) Crushed Concrete Foundation Course	Moisture Deflection/ Moisture Density	- - - - - - - - - -	In-place moisture deflection or moisture density tests every 1,500 square yards or fraction thereof, or in case of short sections, test to confirm compliance with the specifications. For widening, test every 1,500 square yards or fraction thereof, per side. If tested layer is disturbed by construction operations, rain, etc., re-tests shall be taken to assure compliance with the	- - - - - - - - - -	- - - - - - - - - -	Section 27 Note 28
	Gradation	- - - - - - - - - -	One sample for testing each 500 cubic yards or fraction thereof. The sample shall be taken at the project. (The recommended sample size is 50 pounds. Project personnel will supply the 60-pound sample needed to perform the testing shown under the central laboratory column. The sample shall be	- - - - - - - - - -	One 60-pound sample for gradation each 2,500 cubic yards or fraction thereof (Duplicate of sample tested in the field)	Section 27 Note 28
Laboratory samples must be submitted in a canvas bag or a clean 5-gallon bucket with lid.						

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 12 – Foundation Course (Crushed Concrete, Bituminous, Aggregate-D, Crushed Rock), (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
2) Bituminous Foundation Course	Moisture Deflection/ Moisture Density	- - - - - - - - - -	In-place moisture deflection or moisture density tests every 1,500 square yards or fraction thereof, or in case of short sections, test to confirm compliance with the specifications. For widening, test every 1,500 square yards or fraction thereof, per side. If tested layer is disturbed by construction operations, rain, etc., re-tests shall be taken to assure compliance with the specifications.	- - - - - - - - - -	- - - - - - - - - -	Section 27 Note 28
	Gradation	- - - - - - - - - -	One sample for testing each 500 cubic yards or fraction thereof. The sample shall be taken at the project (The recommended sample size is 35 pounds).	- - - - - - - - - -	- - - - - - - - - -	Section 27 Note 28
Laboratory samples must be submitted in a canvas bag or a clean 5-gallon bucket with lid.						

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 12 – Foundation Course (Crushed Concrete, Bituminous, Aggregate-D, Crushed Rock), (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
3) Aggregate Foundation Course – D	Moisture Deflection/ Moisture Density	- - - - - - - - - -	In-place moisture deflection or moisture density tests every 1,500 square yards or fraction thereof, or in case of short sections, test to confirm compliance with the specifications. For widening, test every 1,500 square yards or fraction thereof, per side. If tested layer is disturbed by construction operations, rain, etc., re-tests shall be taken to assure compliance with the specifications.	- - - - - - - - - -	- - - - - - - - - -	Section 27 Note 28
	Gradation, FAA & Compaction	- - - - - - - - - -	One sample for testing each 750 ton or fraction thereof. The sample shall be taken at the project (The recommended sample size is 25 pounds). Project personnel will supply the 60-pound sample needed to perform the testing shown under the central laboratory column. The sample shall be taken at the project.	- - - - - - - - - -	First sample will be one 60-pound sample for gradation, FAA, Quality and moisture density tests. (Sample must be submitted prior to placement). Remaining samples will each be one 20-pound sample for gradation and FAA tests each 3,750 ton or fraction thereof (Duplicate sample tested in the field).	Section 27 Note 28
Laboratory samples must be submitted in a canvas bag or a clean 5-gallon bucket with lid.						

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 12 – Foundation Course (Crushed Concrete, Bituminous, Aggregate-D, Crushed Rock), (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
4) Crushed Rock Foundation Course	Moisture Deflection/ Moisture Density	- - - - - - - - - -	In-place moisture deflection or moisture density tests every 1,500 square yards or fraction thereof.	- - - - - - - - - -	- - - - - - - - - -	Section 27 Note 28
	Gradation	- - - - - - - - - -	One sample for testing each 500 cubic yards or fraction thereof. Project personnel will supply the 60-pound sample needed to perform the testing shown under the central laboratory column. The sample shall be taken at the project.	- - - - - - - - - -	One 60-pound sample for gradation each 2,500 cubic yards or fraction thereof (Duplicate of sample tested in the field)	Section 27 Note 28
Laboratory samples must be submitted in a canvas bag or a clean 5-gallon bucket with lid.						

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MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 13 – Granular Base, Granular Fill, Granular Backfill, Sand Blanket and MSE Walls			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
1) All – Mineral Aggregates and Soil Binder	Experimental Base Course Mixtures (When Mix Design Required)	Contractor to submit the 60-pound sample of sand and the 20-pound sample of soil binder needed to perform the testing shown under the central laboratory column. The contractor needs to submit the anticipated percentages of granular material and soil binder that will be used for stabilization.	- - - - - - - - - -	- - - - - - - - - -	Approximately 60 pounds of each aggregate and approximately 20 pounds of soil binder for EBCM mix design. To be submitted prior to mixture production.	- - - - - - - - - -
2) Mineral Aggregates (Commercial Production)	Quality & Gradation (If Specified)	- - - - - - - - - -	One sample for gradation each 300 cubic yards either at the source or on the project (The recommended sample size is 25 pounds). Project personnel will submit the 10- and 60-pound samples when needed to perform the testing shown under the central laboratory column.	- - - - - - - - - -	One 60-pound sample for quality tests from the first 1,000 cubic yards, if so designated by the Aggregate Laboratory Manager or when changes in quality or characteristics occur One 10-pound sample for gradation tests each 1,500 cubic yards or fraction thereof (Duplicate of sample tested in the field).	Section 27 Note 1 Note 4 Note 28
Laboratory samples must be submitted in a canvas bag or clean 5-gallon bucket with lid.						

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 13 – Granular Base, Granular Fill, Granular Backfill, Sand Blanket and MSE Walls (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
3) Coarse Sand	Quality & Gradation (If Specified)	- - - - - - - - - -	One sample for gradation tests each 300 cubic yards or fraction thereof (The recommended sample size is 25 pounds). Project personnel will submit the 10- and 60-pound samples when needed to perform the testing shown under the central laboratory column. Sample shall be taken at the project.	- - - - - - - - - -	One 60-pound sample for quality tests from the first 1,000 cubic yards if so designated by the Aggregate Laboratory Manager or when changes in quality or characteristics occur One 10-pound sample for gradation tests each 1,500 cubic yards or fraction thereof (Duplicate of sample tested in the field).	Section 27 Note 1 Note 4 Note 28
4) Fine Sand	Gradation (If Specified)	- - - - - - - - - -	One sample for gradation tests each 300 cubic yards or fraction thereof. (The recommended sample size is 25 pounds). Project personnel to submit the 10-pound sample needed to perform the testing shown under the central laboratory column. Sample shall be taken at the project.	- - - - - - - - - -	One 10-pound sample for gradation tests each 1,500 cubic yards or fraction thereof (Duplicate of sample tested in the field).	Section 27 Note 1 Note 4 Note 28
Laboratory samples must be submitted in a canvas bag or clean 5-gallon bucket with lid.						

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 13 – Granular Base, Granular Fill, Granular Backfill, Sand Blanket and MSE Walls (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
5) Soil Binder	Gradation & Plasticity Index	- - - - - - - - - -	One sample for gradation tests each 50 cubic yards or fraction thereof (The recommended sample size is 10 pounds). If less than 10 percent retained on the No. 200 sieve, one sample for each 200 cubic yards or fraction thereof. Project personnel to submit the 10-pound sample needed to perform the testing shown under the central laboratory column. Sample shall be taken at the project.	- - - - - - - - - -	One 10-pound sample for gradation test (Laboratory to run P.I.) each 1,000 cubic yards or fraction thereof (Duplicate of sample tested in the field).	Section 27 Note 28
Laboratory samples must be submitted in a canvas bag or clean 5-gallon bucket with lid.						

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 13 – Granular Base, Granular Fill, Granular Backfill, Sand Blanket and MSE Walls (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
6) Granular Base, Granular Fill, Granular Backfill and Sand Blanket	Moisture Deflection/ Moisture Density	- - - - - - - - - -	In place moisture deflection or moisture density tests every 1,500 cubic yards or fraction thereof or for every one foot of thickness, whichever is greater. In cases of short sections, test to confirm the project manager's judgment on compliance with specification requirements. NOTE: If the layer is 2" or less in thickness, tests may be omitted. If index or curve data is not furnished, it will be necessary for the project personnel to submit the necessary samples to the central or branch laboratories for the determination of this information.	One 60-pound sample to be submitted if necessary to perform index and compaction curve tests.	One 60-pound sample to be submitted if necessary to perform index and compaction curve tests.	Section 27 Note 28
Laboratory samples must be submitted in a canvas bag or clean 5-gallon bucket with lid.						

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 13 – Granular Base, Granular Fill, Granular Backfill, Sand Blanket and MSE Walls (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
6) Granular Base, Granular Fill, Granular Backfill and Sand Blanket, cont.	Gradation (If Specified)	- - - - - - - - - -	Every 750 cubic yards or fraction thereof, or in cases of short sections the number of samples is to be increased to adequately represent the material in the fill (The recommended sample size is 25 pounds). Project personnel will supply the 10-pound sample needed to perform the testing shown under the central laboratory column. Sample shall be taken at the project.	- - - - - - - - - -	One 10-pound sample for gradation test every 3,750 cubic yards or fraction thereof, or in cases of short sections the number of samples is to be increased to adequately correlate the samples taken in the field (Duplicate of sample tested in the field).	Section 27 Note 1 Note 4 Note 28
Laboratory samples must be submitted in a canvas bag or clean 5-gallon bucket with lid.						

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 13 – Granular Base, Granular Fill, Granular Backfill, Sand Blanket and MSE Walls (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
7) Stabilized Portion of Granular Base, Granular Fill, Granular Backfill and Sand Blanket	Moisture Deflection/ Moisture Density	- - - - - - - - - -	In place moisture deflection or moisture density tests every 1,500 cubic yards, or fraction thereof, or in cases of short sections, test to confirm the project manager's judgment on compliance with specification requirements. If tested layer is disturbed by construction operations, rain etc., re-tests shall be taken to assure compliance with specifications prior to subsequent construction. The sample shall be taken at the project.	- - - - - - - - - -	- - - - - - - - - -	Section 27 Note 28
	Gradation (If Specified)	- - - - - - - - - -	One sample every 750 cubic yards or fraction thereof for gradation, or in cases of short sections the number of samples is to be increased to adequately represent the material in the field. (The recommended sample size is 25 pounds). Project personnel will supply the 10-pound sample needed to perform the testing shown under the central laboratory column. The sample shall be taken at the project.	- - - - - - - - - -	One 10-pound sample for gradation test every 3,750 cubic yards or fraction thereof, or in case of short sections the number of samples is to be increased to adequately correlate the samples taken in the field (Duplicate of sample tested in the field).	Section 27 Note 28
Laboratory samples must be submitted in a canvas bag or clean 5-gallon bucket with lid.						

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 13 – Granular Base, Granular Fill, Granular Backfill, Sand Blanket and MSE Walls (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
8) Granular Backfill for Structures	Quality & Gradation	- - - - - - - - - -	One sample for gradation tests each 500 cubic yards or fraction thereof (The recommended sample size is 25 pounds). Project personnel will submit the 10- and 60-pound samples when needed to perform the testing shown under the central laboratory column. The sample shall be taken at the project.	- - - - - - - - - -	One 60-pound sample for quality tests if so designated by the Aggregate Laboratory Manager or when changes in quality or characteristics occur. One 10-pound sample for gradation tests each 2,500 cubic yards or fraction thereof (Duplicate of sample tested in the field).	Section 27 Note 1 Note 4 Note 28
	Moisture Deflection/ Moisture Density	- - - - - - - - - -	In place moisture deflection or moisture density test for every foot of backfill placed. In case of short sections, test to confirm compliance with specifications. Project personnel will supply the 60-pound sampled needed to perform the testing shown under the central laboratory column. The sample shall be taken on the project.	- - - - - - - - - -	One 60-pound sample for index and compaction curve tests.	Section 27 Note 28
Laboratory samples must be submitted in a canvas bag or clean 5-gallon bucket with lid.						

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 13 – Granular Base, Granular Fill, Granular Backfill, Sand Blanket and MSE Walls (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
9) Granular Subdrains	FAA, Gradation, Quality & Compaction	- - - - - - - - - -	One sample for gradation tests each 250 cubic yards or fraction thereof (The recommended sample size is 25 pounds). Project personnel will supply the 10- and 60-pound samples needed to perform the testing shown under the central laboratory column. The sample shall be taken at the project.	- - - - - - - - - -	One 60-pound sample for compaction curve data as necessary. One 10-pound sample for gradation tests each 1,250 cubic yards of aggregate or fraction thereof (Duplicate of sample tested in the field).	Section 27 Note 1 Note 4 Note 28
10) Granular Backfill for Pipe Underdrain	Gradation, Quality & Compaction	- - - - - - - - - -	One sample for gradation tests each 250 cubic yards or fraction thereof (The recommended sample size is 25 pounds). Project personnel will supply the 10- and 60-pound samples needed to perform the testing shown under the central laboratory column. The sample shall be taken at the project.	- - - - - - - - - -	One 60-pound sample for compaction curve data as necessary. One 10-pound sample for gradation tests each 1,250 cubic yards of aggregate or fraction thereof (Duplicate of sample tested in the field).	Section 27 Note 1 Note 4 Note 28
Laboratory samples must be submitted in a canvas bag or clean 5-gallon bucket with lid.						

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 13 – Granular Base, Granular Fill, Granular Backfill, Sand Blanket and MSE Walls (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
11) Select and Random Granular Backfill for MSE Walls	Quality, Gradation, Compaction, & Chemical, Friction Angle	Before the wall is constructed, the contractor shall furnish to the engineer a Certificate of Test certifying that the granular backfill material complies with section 714 or 715 of the specifications. If more than one source is used, a Certificate of Test is required from each source.	Project personnel will submit one 60-pound sample per wall needed to perform the testing shown under the central laboratory column. No further samples required if material is from the same source (pit location) or unless changes in quality or characteristics occur. One gradation for every 1,000 cubic yards of material or portion thereof.	- - - - - - - - - -	One 60-pound sample for quality, gradation, compaction and chemical tests.	Section 27 Note 28
	Moisture Deflection/ Moisture Density	- - - - - - - - - -	In place moisture deflection or moisture density test for every foot of backfill placed. In case of short sections test to confirm compliance with specifications. Project personnel will supply the 60-pound sample needed to perform the testing shown under the central laboratory column. The sample shall be taken on the project.	- - - - - - - - - -	One 60-pound sample for index and compaction curve tests.	Section 27 Note 28
Laboratory samples must be submitted in a canvas bag or clean 5-gallon bucket with lid.						

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3. **Silica Fume (Removed 7/1/2021)**

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 14 – Portland Cement/Interground-Blended Cement/Silica Fume			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
1) Portland Cement	Quality	- - - - - - - - - -	Refer to the Nebraska Qualified Material Vendors List. Portland cement can be used on the project when accompanied with a manufacturer's certification. A 1-gallon sample is required when requested by the Materials & Research Division, the inspector questions the material, or the material has been in storage for 90 days or more. Sample to be submitted to the central laboratory.	- - - - - - - - - -	A 1-gallon sample when submitted from cement mill or field.	Section 29 Policy 4
2) Inter-ground/ Blended Cement	Quality	- - - - - - - - - -	Refer to the Nebraska Qualified Material Vendors List. Portland cement can be used on the project when accompanied with a manufacturer's certification. A 15-pound sample is required per project or for every 750 tons of interground/blended cement that is used on a project or if the inspector questions the material, or the material has been in storage for 90 days or more. Sample to be submitted to the central laboratory.	- - - - - - - - - -	A 15-pound sample when submitted from field.	Section 29 Policy 4
3) Silica Fume (Removed 7/1/2021)						

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MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 15 - Portland Cement Concrete for Pavement, Base Course, Base Course Widening, Pavement Patching, etc.			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
1) Class E and F Aggregates	Quality & Gradation	One gradation test for each 1,000 ton of aggregate or fraction thereof, for acceptance either at the plant or on the project. Minimum of one gradation test for each project. For ready mix plants in the Omaha area, the number of samples taken from the plant is determined by plant volume supplied to state and federal projects (60-pound sample is required).	Verification: Project personnel will randomly select one contractor's split sample (30 pounds) for each 3,000 ton or fraction thereof, for central laboratory. Quality: Project personnel will supply a 60-pound sample for central laboratory.	- - - - - - - - - -	One 30-pound contractor's split verification sample for each 3,000 ton or fraction thereof, for gradation tests. One 60-pound sample for every 6,000 ton or fraction thereof, for quality tests.	Section 27 Note 1
2) Class A, B, and C Aggregates	Quality & Gradation	One gradation test for each 2,000 ton of aggregate or fraction thereof, for acceptance either at the plant or on the project. Minimum of one gradation test for each project. For ready mix plants in the Omaha area, the number of samples taken from the plant is determined by plant volume supplied to state and federal projects (30-pound sample is required).	Verification: Project personnel will randomly select one contractor's split sample (15 pounds) for each 6,000 ton or fraction thereof, for central laboratory. Quality: Project personnel will supply a 60-pound sample for central laboratory.	- - - - - - - - - -	One 15-pound contractor's split verification sample for each 6,000 ton or fraction thereof.	Section 27 Note 1 Note 4
3) Class R Aggregate	Quality & Gradation	One gradation test for each 2,000 ton of aggregate or fraction thereof, for acceptance either at the plant or on the project. Minimum of one gradation test for each project. For ready mix plants in the Omaha area, the number of samples taken from the plant is determined by plant volume supplied to state and federal projects (when applicable, 60-pound ledge rock and 30-pound sand and gravel sample is required).	Verification: Project personnel will randomly select one contractor's split sample (30 pounds) for each 6,000 ton or fraction thereof, for central laboratory. Quality: Frequency will be determined by mix design approval.	- - - - - - - - - -	One 30-pound contractor's split verification sample for each 6,000 ton or fraction thereof.	Section 27 Note 1 Note 4

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 15 - Portland Cement Concrete for Pavement, Base Course, Base Course Widening, Pavement Patching, etc.			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
4) All Aggregates	Moisture	A minimum of one for every 1/3 day of operation as necessary for adequate control of aggregate proportions and total water content of the concrete.	----------	----------	----------	Section 27 Note 1
5) Mixing Water	Quality	----------	A 1-gallon sample to be submitted to central laboratory, when of questionable nature.	----------	Mixing water will be tested in the central laboratory.	----------
6) Wash Water	Quality	A request for approval must be submitted.	A 1-gallon sample to be submitted to central laboratory	----------	Wash water will be tested in the central laboratory	Section 29 Policy 7
7a) Plastic Concrete (Non-QA/QC)	Air Content		<u>Paving</u> First load and then one per 300 cubic yards <u>Patching</u> Minimum of one test each 1/3 day's operation or sufficient number for proper control.	----------	----------	Section 27 Note 1 Note 6 Note 28
7b) Plastic Concrete (QA/QC)	Air Content	First load and then one per 300 cubic yards	----------	----------	----------	Section 27 Note 1 Note 6 Note 28
	Unit Weight	First load and then one per 300 cubic yards in front of the paver. The concrete will be sampled behind the paver every half day.	Every half day of paving.	Testing and sampling for verification testing and dispute resolution as needed.	----------	
8) Concrete Test Cylinders	Compressive Strength	----------	Four 4x8 cylinders shall be made for each day's placement. Cylinders will be tested in the branch laboratory or central laboratory.	Cylinders will be tested in the branch laboratory or central laboratory.	Cylinders will be tested in the branch laboratory or central laboratory.	Section 27 Note 1 Note 6

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 15 - Portland Cement Concrete for Pavement, Base Course, Base Course Widening, Pavement Patching, etc.			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
9) Concrete Cores	Slab Thickness	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	To be sampled by the Materials & Research Division in accordance with the standard specifications or special provisions.	- - - - - - - - - -
10) PCC Pavement	Surface Smoothness	Contractor performs all QC pavement smoothness testing specified in the NDOT Standard Specifications for Highway Construction and/or project special provisions.	Approximately 10 percent of contractor's results may be randomly verified. Project personnel will submit requests for pavement smoothness verification testing to the Materials & Research Division Submit requests at least 7 days in advance to allow for scheduling.	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -

ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED *(TESTS TO BE MADE AT CENTRAL LABORATORY)*	APPROVED PRODUCTS LIST	NEBRASKA QUALIFIED MATERIAL VENDORS LIST	MANUFACTURER CERTIFIED TESTS REQUIRED	MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED	BUY AMERICA COMPLIANCE REQUIRED	LOCATION OF ADDITIONAL INFORMATION
Section 15 - Portland Cement Concrete for Pavement, Base Course, Base Course Widening, Pavement Patching, etc. (continued)							
11) Concrete Curing Materials	- - - - - - - - - -	- - - - - - - -	- - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
A. Liquid Compounds	Yes – One-quart sample from each lot or batch unless shipped from tested and approved stock.	No	No	No	No	No	Section 27 Note 8
B. Plastic Film	- - - - - - - - - -	No	No	No	No	No	- - - - - - - - - -
C. Burlap Cloth	- - - - - - - - - -	No	No	No	No	No	- - - - - - - - - -
12) Reinforcement Bars	Yes – Two six-foot long samples from every bar designation and heat number unless shipped from tested and approved stock.	No	No	Yes	No	Yes	Section 27 Note 9 Note 30
A. Dowel Bars	- - - - - - - - - -	No	No	Yes	No	Yes	Section 27 Note 30
B. Glass Fiber Reinforced Polymer (GFRP) Dowel Bars	- - - - - - - - - -	No	No	Yes	No	No	- - - - - - - - - -
13) Welded Wire Fabric	Yes – One sample, 36-inches square, from each 75,000 square feet of fabric unless shipped from tested and approved stock.	No	No	Yes	No	Yes	Section 27 Note 9 Note 30
14) Deformed Metal Joint Material	No – Project manager shall check material for compliance with Standard Plans.	No	No	No	Yes	Yes	Section 27 Note 30
15) Elastomeric Compression Joint Seal	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 30
16) Lubricant Adhesive for Elastomeric Compression Joint Seals	No sample required, however, material should be as recommended or approved by the manufacturer for use with the joint seal.	No	No	No	No	No	- - - - - - - - - -
17) Epoxy Compound	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
18) Joint and Crack Sealing Fillers	- - - - - - - - - -	- - - - - - -	- - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
A. Cold Applied Type	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30

ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED *(TESTS TO BE MADE AT CENTRAL LABORATORY)*	APPROVED PRODUCTS LIST	NEBRASKA QUALIFIED MATERIAL VENDORS LIST	MANUFACTURER CERTIFIED TESTS REQUIRED	MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED	BUY AMERICA COMPLIANCE REQUIRED	LOCATION OF ADDITIONAL INFORMATION
Section 15 - Portland Cement Concrete for Pavement, Base Course, Base Course Widening, Pavement Patching, etc. (continued)							
B. Hot Poured Type	Samples are required if any physical characteristic of the material demonstrates non-compliance with the specification.	Yes	No	No	No	No	- - - - - - - - - -
19) Load Transfer Device Assemblies for Reinforced Concrete Pavement Joints	Yes – See Standard Specifications for Highway Construction or special provisions.	No	No	No	Yes	No	- - - - - - - - - -
20) Preformed Joint Filler	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
A. Non-extruding	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
B. Bituminous	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
C. Sponge Rubber	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
D. Semi-Rigid, Closed-Cell Polypropylene Foam	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
21) Pressure Relief Joint Filler, Preformed Flexible Polyurethane	Yes – One sample, 5-inch wide and 30-inches long, from each shipment of 1,000 square feet or less of each thickness and kind, unless shipped from tested and approved stock, or specified brands used	No	No	No	Yes	Yes	Section 27 Note 30
22) Concrete Chemical Admixtures	- - - - - - - - - -	No	No	No	No	No	Section 27 Note 7
23) Calcium Chloride (Removed 7/15/2015)							
24) Concrete Sealers	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30

ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED *(TESTS TO BE MADE AT CENTRAL LABORATORY)*	APPROVED PRODUCTS LIST	NEBRASKA QUALIFIED MATERIAL VENDORS LIST	MANUFACTURER CERTIFIED TESTS REQUIRED	MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED	BUY AMERICA COMPLIANCE REQUIRED	LOCATION OF ADDITIONAL INFORMATION
Section 15 - Portland Cement Concrete for Pavement, Base Course, Base Course Widening, Pavement Patching, etc. (continued)							
25) Concrete Pavement Repair, Flexible Polymer	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
26) Pigmented Concrete Coating	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
27) Epoxy Penetrating Sealers	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
28) Powdered Epoxy Resin Coating Material	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
29) Sealing Compounds - Type I (Flow, Self-Leveling) and Type II (Non-Sag)	- - - - - - - - - -	Yes	No	No	No	No	- - - - - - - - - -
30) Bond Breakers for Dowel Bars	- - - - - - - - - -	Yes	No	No	No	No	- - - - - - - - - -
31) Resin Adhesives	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
32) Non-shrink Grout	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
33) Pavement & Structural Patching Material	- - - - - - - - - -	Yes	No	No	No	No	- - - - - - - - - -

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Portland Cement Concrete for Structures, Culverts, and Miscellaneous Construction

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MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 16 - Portland Cement Concrete for Structures, Culverts, and Miscellaneous Construction			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
1) Class E and F Aggregates	Quality & Gradation	One gradation test for each 1,000 ton of aggregate or fraction thereof, for acceptance either at the plant or on the project. Minimum of one gradation test for each project. For ready mix plants in the Omaha area, the number of samples taken from the plant is determined by plant volume supplied to state and federal projects (60-pound sample is required).	Verification: Project personnel will randomly select one contractor's split sample (30 pounds) for each 3,000 ton or fraction thereof, for central laboratory. Quality: Project personnel will supply a 60-pound sample for central laboratory.	- - - - - - - - - -	One 30-pound contractor's split verification sample for each 3,000 ton or fraction thereof, for gradation tests. One 60-pound sample for every 6,000 ton or fraction thereof, for quality tests.	Section 27 Note 1
2) Class A, B, and C Aggregates	Quality & Gradation	One gradation test for each 2,000 ton of aggregate or fraction thereof, for acceptance either at the plant or on the project. Minimum of one gradation test for each project. For ready mix plants in the Omaha area, the number of samples taken from the plant is determined by plant volume supplied to state and federal projects (30-pound sample is required).	Verification: Project personnel will randomly select one contractor's split sample (15 pounds) for each 6,000 ton or fraction thereof, for central laboratory. Quality: Project personnel will supply a 60-pound sample for central laboratory	- - - - - - - - - -	One 15-pound contractor's split verification sample for each 6,000 ton or fraction thereof.	Section 27 Note 1 Note 4
3) Class R Aggregate	Quality & Gradation	One gradation test for each 2,000 ton of aggregate or fraction thereof, for acceptance either at the plant or on the project. Minimum of one gradation test for each project. For ready mix plants in the Omaha area, the number of samples taken from the plant is determined by plant volume supplied to state and federal projects (when applicable, 60-pound ledge rock and 30-pound sand and gravel sample is required).	Verification: Project personnel will randomly select one contractor's split sample (30 pounds) for each 6,000 ton or fraction thereof, for central laboratory. Quality: Frequency will be determined by mix design approval.	- - - - - - - - - -	One 30-pound contractor's split verification sample for each 6,000 ton or fraction thereof.	Section 27 Note 1 Note 4

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 16 – Portland Cement Concrete for Structures, Culverts, and Miscellaneous Construction (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
4) Light-weight Aggregate	Quality & Gradation	- - - - - - - - - -	See specifications, supplemental specifications and/or project special provisions Project personnel to submit the 20-pound sample needed to perform the testing shown under the central laboratory column.	See specifications, supplemental specifications and/or project special provisions	One 20-pound sample per project	- - - - - - - - - -
5) All Aggregates	Moisture	A minimum of one for every 1/3 day of operation as necessary for adequate control of aggregate proportions and total water content of the concrete.	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	Section 27 Note 1
6) Mixing Water	Quality	- - - - - - - - - -	A 1-gallon sample to be submitted to central laboratory, when of questionable nature.	- - - - - - - - - -	Mixing water will be tested in the central laboratory.	- - - - - - - - - -
7) Wash Water	Quality	A request for approval must be submitted	A 1-gallon sample to be submitted to the central laboratory	- - - - - - - - - -	Wash water will be tested in the central laboratory	Section 29 Policy 7
8) Plastic Concrete	Air Content	- - - - - - - - - -	First load and then test one-third day's operation, or sufficient number for proper control. <u>Bridge Deck</u> Air content shall be taken in front of the paver on the deck.	- - - - - - - - - -	- - - - - - - - - -	Section 27 Note 1 Note 28

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 16 – Portland Cement Concrete for Structures, Culverts, and Miscellaneous Construction (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
8) Plastic Concrete, Cont,.	Slump	- - - - - - - - - -	Minimum of one test for each day's operation, or sufficient number for proper control. Except for patching.	- - - - - - - - - -	- - - - - - - - - -	Section 27 Note 1
9) Light-weight Concrete	Air Content	- - - - - - - - - -	First load and then test one-third day's operation, or sufficient number for proper control. <u>Bridge Deck</u> Air content shall be taken in front of the paver on the deck.	- - - - - - - - - -	- - - - - - - - - -	Section 27 Note 28
	Slump	- - - - - - - - - -	Minimum of one test for each day's operation, or sufficient number for proper control. Except for patching.	- - - - - - - - - -	- - - - - - - - - -	
	Unit Weight	- - - - - - - - - -	<u>Bridge Deck</u> Unit weight shall be taken in front of the paver on the deck.	- - - - - - - - - -	- - - - - - - - - -	

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 16 – Portland Cement Concrete for Structures, Culverts, and Miscellaneous Construction (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
10) Concrete Test Cylinders	Compressive Strength	- - - - - - - - - -	One set of four 4x8 cylinders for any placement up to 100 cubic yards. For bridge deck pours over 100 cubic yards, three sets of four 4x8 cylinders are required for each 1/3 day's production. For other structures over 100 cubic yards, two sets of four 4X8 cylinders are required. Cylinders will be tested in the branch laboratory or the central laboratory.	Cylinders will be tested in the branch or the central laboratory.	Cylinders will be tested in the branch or the central laboratory.	Section 27 Note 1 Note 6 Note 28
11) Shotcrete	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
A) Mortar Cubes	Compressive Strength	- - - - - - - - - -	Two sets of three 2-inch cubes shall be made for every day's production.	Cubes will be tested in the branch or central laboratory.	Cubes will be tested in the branch or central laboratory.	Section 27, Note 6
B) Concrete Cores	Compressive Strength	- - - - - - - - - -	One set of nine 3-inch diameter cores for every 50 CY, but not less than one set each day.	Cores will be tested in the branch or central laboratory.	Cores will be tested in the branch or central laboratory.	Section 27, Note 6

ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED *(TESTS TO BE MADE AT CENTRAL LABORATORY)*	APPROVED PRODUCTS LIST	NEBRASKA QUALIFIED MATERIAL VENDORS LIST	MANUFACTURER CERTIFIED TESTS REQUIRED	MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED	BUY AMERICA COMPLIANCE REQUIRED	LOCATION OF ADDITIONAL INFORMATION
Section 16 – Portland Cement Concrete for Structures, Culverts, and Miscellaneous Construction (continued)							
12) Shotcrete	- - - - - - - - - -	Yes	No	No	No	No	- - - - - - - -
13) Concrete Curing Materials	- - - - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - -	- - - - - - - -
A) Liquid Compounds	Yes – One-quart sample from each lot or batch unless shipped from tested and approved stock.	No	No	No	No	No	Section 27 Note 8
B) Plastic Film	- - - - - - - - - -	No	No	No	No	No	- - - - - - - -
C) Burlap Cloth	- - - - - - - - - -	No	No	No	No	No	- - - - - - - -
14) Reinforcement Bars	Yes – Two six-foot long samples from every bar designation and heat number unless shipped from tested and approved stock.	No	No	Yes	No	Yes	Section 27 Note 9 Note 30
15) Welded Wire Fabric	Yes – One sample, 36-inches square, from each 75,000 square feet of fabric unless shipped from tested and approved stock.	No	No	Yes	No	Yes	Section 27 Note 9 Note 30
16) Concrete Chemical Admixtures	- - - - - - - - - -	No	No	No	No	No	Section 27 Note 7
17) Concrete Sealers	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
18) Concrete Pavement Repair, Flexible Polymer	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
19) Pigmented Concrete Coating	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
20) Sewer Joint Compound	- - - - - - - - - -	Yes	No	No	No	No	- - - - - - - - -
21) Epoxy Penetrating Sealers	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
22) Powdered Epoxy Resin Coating Material	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
23) Sealing Compounds - Type I (Flow, Self-Leveling) and Type II (Non-Sag)	- - - - - - - - - -	Yes	No	No	No	No	- - - - - - - - -

ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED *(TESTS TO BE MADE AT CENTRAL LABORATORY)*	APPROVED PRODUCTS LIST	NEBRASKA QUALIFIED MATERIAL VENDORS LIST	MANUFACTURER CERTIFIED TESTS REQUIRED	MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED	BUY AMERICA COMPLIANCE REQUIRED	LOCATION OF ADDITIONAL INFORMATION
Section 16 – Portland Cement Concrete for Structures, Culverts, and Miscellaneous Construction (continued)							
24) Bond Breakers for Dowel Bars (Removed 7/1/2020)							
25) Resin Adhesives	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
26) Non-shrink Grout	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
27) Pavement & Structural Patching Material	- - - - - - - - - -	Yes	No	No	No	No	- - - - - - - -

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ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED *(TESTS TO BE MADE AT CENTRAL LABORATORY)*	APPROVED PRODUCTS LIST	NEBRASKA QUALIFIED MATERIAL VENDORS LIST	MANUFACTURER CERTIFIED TESTS REQUIRED	MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED	BUY AMERICA COMPLIANCE REQUIRED	LOCATION OF ADDITIONAL INFORMATION
Section 17 – Guardrail							
1) Cable and Beam Guardrail assemblies	Yes – At least one sample of each of the items used in the guardrail assembly unless shipped from tested and approved stock. Sample will be returned.	No	No	Yes	No	Yes	Section 27 Note 1 Note 10 Note 30
2) End Anchor Assembly and Breakaway Terminal Section	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 10 Note 30
3) Miscellaneous Hardware Bolts, Washers, etc.	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 1 Note 10 Note 30
4) Wood Guardrail Posts and Blocks	- - - - - - - - - -	No	No	Yes	Yes	Yes	Section 27 Note 25 Note 30
5) Guardrail End Treatment, Type I and II	No – Unless requested by Materials & Research Division	No	No	No	Yes	Yes	Section 27 Note 10 Note 30
6) MASH Impact Attenuator	- - - - - - - - - -	No	Yes	No	Yes	Yes	Section 27 Note 30

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8. Tubular, ‘H’, and ‘C’ Sections for Post Braces, Top Rail, etc. 18-1
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ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED ***(TESTS TO BE MADE AT CENTRAL LABORATORY)***	**APPROVED PRODUCTS LIST**	**NEBRASKA QUALIFIED MATERIAL VENDORS LIST**	**MANUFACTURER CERTIFIED TESTS REQUIRED**	**MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED**	**BUY AMERICA COMPLIANCE REQUIRED**	**LOCATION OF ADDITIONAL INFORMATION**
SECTION 18 – Fence Materials							
1) Fence (Barbed Wire, Chain Link Fabric, Right of Way, Woven Wire)	Yes – One 4 ft sample, from each type, from one of each 50 units.	No	No	Yes	No	Yes	Section 27 Note 1 Note 30
2) Handrail and Barrier Rail	Yes – One full section sample from each size. Samples will be returned.	No	No	Yes	No	Yes	Section 27 Note 1 Note 30
3) Fence Fasteners and Ties	Yes – Five from each 1,000 pounds.	No	No	Yes	No	Yes	Section 27 Note 1 Note 30
4) Fittings and Hardware	Yes – One sample of each item. Samples will be returned.	No	No	Yes	No	Yes	Section 27 Note 1 Note 30
5) Staples	Yes – Five staples from one of each 15 kegs or each 1,000 pounds.	No	No	Yes	No	Yes	Section 27 Note 1 Note 30
6) Steel ‘T’ Line Posts	Yes – One post from each 5,000 posts or fraction thereof. Samples will be returned.	No	No	Yes	No	Yes	Section 27 Note 1 Note 30
7) Tension Wire	Yes – One sample 4 ft long from each 2,000 pounds or fraction thereof.	No	No	Yes	No	Yes	Section 27 Note 1 Note 30
8) Tubular, ‘H’, and ‘C’ Sections for Post Braces, Top Rail, etc.	Yes – One full section sample from each lot. Samples will be returned.	No	No	Yes	No	Yes	Section 27 Note 1 Note 30
9) Wooden Posts	No – Unless required by the Materials & Research Division.	No	No	See Note	See Note	Yes	Section 27 Note 1 Note 25 Note 30

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ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED ***(TESTS TO BE MADE AT CENTRAL LABORATORY)***	**APPROVED PRODUCTS LIST**	**NEBRASKA QUALIFIED MATERIAL VENDORS LIST**	**MANUFACTURER CERTIFIED TESTS REQUIRED**	**MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED**	**BUY AMERICA COMPLIANCE REQUIRED**	**LOCATION OF ADDITIONAL INFORMATION**
Section 19 – Culvert Pipe, Drain Tile, Sewer Pipe, Slope Drains and Related Materials							
1) Culvert	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
A) Metal Pipe (Zinc Coated Galvanized Steel, Aluminum Coated Steel, Polymer Coated Steel)	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	See Post Applied Coatings and Flexible Pipe Joints (page 19-2) for applicable coating and joint information
a) Pipe (All Shapes)	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 11 Note 30
b) Flared End Sections	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 11 Note 30
c) Structural Plate Pipe	Yes – The coupon attached should be submitted for testing. If no coupon, a sample approximately 3-inches square should be submitted. The project manager shall advise the Materials & Research Division in writing as to the length, brand, size, and heat numbers of the pipe.	No	No	Yes	No	Yes	Section 27 Note 30
B) Reinforced Concrete	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
a) Pipe (All Shapes)	- - - - - - - - - -	No	Yes	No	Yes	Yes	Section 27 Note 30 *
b) Flared End Sections	- - - - - - - - - -	No	Yes	No	Yes	Yes	Section 27 Note 30 *

* See Section 29, Policy 9 'Policy Concerning Testing, Inspection and Reporting of Reinforced Concrete Culvert and Sewer Pipe and Concrete Flared End Sections'
**See Section 29, Policy 10, Policy Concerning Plastic Pipe Certification and Approval

ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED ***(TESTS TO BE MADE AT CENTRAL LABORATORY)***	**APPROVED PRODUCTS LIST**	**NEBRASKA QUALIFIED MATERIAL VENDORS LIST**	**MANUFACTURER CERTIFIED TESTS REQUIRED**	**MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED**	**BUY AMERICA COMPLIANCE REQUIRED**	**LOCATION OF ADDITIONAL INFORMATION**
Section 19 – Culvert Pipe, Drain Tile, Sewer Pipe, Slope Drains and Related Materials (continued)							
C) Plastic (All Shapes)	- - - - - - - - - -	No	Yes	No	Yes	Yes	See Flexible Pipe Joints (page 19-2) for applicable joint information Section 27 Note 30 **
2) Drain Tile	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
A) Plastic/Under-drains	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 11 Note 30
3) Sewer Pipe	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
A) Ductile Iron Pipe and Fittings	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 30
B) Reinforced Concrete	- - - - - - - - - -	No	Yes	No	Yes	Yes	Section 27 Note 1 Note 30 *
C) Plastic (15 inches and larger)	- - - - - - - - - -	No	Yes	No	Yes	Yes	Section 27 Note 30 **
4) Slope Drains (Metal)	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 11 Note 30
5) Related Materials	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -

* See Section 29, Policy 9 'Policy Concerning Testing, Inspection and Reporting of Reinforced Concrete Culvert and Sewer Pipe and Concrete Flared End Sections'
**See Section 29, Policy 10, Policy Concerning Plastic Pipe Certification and Approval

ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED ***(TESTS TO BE MADE AT CENTRAL LABORATORY)***	**APPROVED PRODUCTS LIST**	**NEBRASKA QUALIFIED MATERIAL VENDORS LIST**	**MANUFACTURER CERTIFIED TESTS REQUIRED**	**MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED**	**BUY AMERICA COMPLIANCE REQUIRED**	**LOCATION OF ADDITIONAL INFORMATION**
Section 19 – Culvert Pipe, Drain Tile, Sewer Pipe, Slope Drains and Related Materials (continued)							
A) Sealing Compound for Concrete Pipe Joints	- - - - - - - - - -	Yes	No	No	No	No	- - - - - - - - - -
B) Bituminous Plastic Cement	Yes – One 5-pound (1/2 gallon) sample from each lot or batch unless shipped from tested and approved stock.	No	No	No	No	No	- - - - - - - - - -
C) Sewer Joint Compound	- - - - - - - - - -	Yes	No	No	No	No	- - - - - - - - - -
D) Sewer Pipe Gaskets	- - - - - - - - - -	Yes	No	No	Yes	No	- - - - - - - - - -
E) Flexible Pipe Joints	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
F) Post Applied Coatings	- - - - - - - - - -	Yes	No	No	No	No	- - - - - - - - - -
G) Silicone Joint Sealers	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
6) Cured-in-Place Pipe (CIPP) Reinforced Plastic Liner	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 30
7) Culvert Repair Liner System	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
8) Preformed Plastics Pipe Joints (Rope Form)	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
9) Preformed Silicone Joint -Type A, Type B	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30

***** See Section 29, Policy 9 'Policy Concerning Testing, Inspection and Reporting of Reinforced Concrete Culvert and Sewer Pipe and Concrete Flared End Sections'

**See Section 29, Policy 10, Policy Concerning Plastic Pipe Certification and Approval

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ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED ***(TESTS TO BE MADE AT CENTRAL LABORATORY)***	**APPROVED PRODUCTS LIST**	**NEBRASKA QUALIFIED MATERIAL VENDORS LIST**	**MANUFACTURER CERTIFIED TESTS REQUIRED**	**MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED**	**BUY AMERICA COMPLIANCE REQUIRED**	**LOCATION OF ADDITIONAL INFORMATION**
Section 20 – Bridge Materials							
1) Aluminum Filled Resilient Sealing Compound Removed 7/1/2021							
2) Asphalt Plank	Yes – Three planks from each 1,000 planks of each thickness.	No	No	No	No	No	- - - - - - - - - -
3) Lock-Pin and Collar Fasteners (High Strength Steel)	Yes – One lock-pin and collar fastener of each size and length from each 800 or fraction thereof, unless shipped from tested and approved stock.	No	No	No	Yes	Yes	Section 27 Note 12 Note 30
4) Bridge Deck Drainage System	- - - - - - - - - -	No	No	No	Yes	No	- - - - - - - - - -
5) Caulking and Sealing Compounds	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
6) Deck Joint Seal	Unless requested by Materials & Research Division	No	No	Yes	No	Yes	Section 27 Note 30
7) Form Insulation	Unless requested by Materials & Research Division	No	No	Yes	No	No	- - - - - - - - - -
8) Galvanized Sheet Metal	Yes – One sample approximately 30-40 square inches from each lot or batch.	No	No	No	Yes	Yes	Section 27 Note 1 Note 30
9) Galvanized Steel Wire Strand	Yes – One sample six feet long from each lot of 5,000 feet or less and two samples from lots of 5,000 to 30,000 feet.	No	No	No	Yes	Yes	Section 27 Note 1 Note 30
10) Lead Sheet	Yes – One sample approximately 30-40 square inches from each lot or batch.	No	No	No	No	Yes	Section 27 Note 1 Note 30
11) Bolts, Nuts, and Washers	- - - - - - - - - -	- - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
A) Anchor	- - - - - - - - - -	- - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -

ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED ***(TESTS TO BE MADE AT CENTRAL LABORATORY)***	**APPROVED PRODUCTS LIST**	**NEBRASKA QUALIFIED MATERIAL VENDORS LIST**	**MANUFACTURER CERTIFIED TESTS REQUIRED**	**MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED**	**BUY AMERICA COMPLIANCE REQUIRED**	**LOCATION OF ADDITIONAL INFORMATION**
Section 20 – Bridge Materials (continued)							
a) High Tensile	Unless shipped from tested and approved stock, the contractor has the option to either provide certified mill test reports on material used or submit one sample bolt of each size to the central laboratory for destructive testing. The sample must be taken by the project manager and must be accompanied by a manufacturer's certificate of compliance. Materials shall not be approved for incorporation into the work until certified mill tests or sample test results and certificates of compliance are in hand.	No	No	Yes	No	Yes	Section 27 Note 12 Note 30
b) Low Carbon (Common)	No – Project manager to measure length and diameter. If galvanized, check in the field by use of magnetic instrument for both bolts and nuts. Report results to the Materials & Research Division.	No	No	Yes	No	Yes	Section 27 Note 12 Note 30
c) Swedge	No – Project manager to measure length and diameter. If galvanized, check in the field by use of magnetic instrument for both bolts and nuts. Report results to the Materials & Research Division.	No	No	Yes	No	Yes	Section 27 Note 12 Note 30
B) Structural Fasteners for Steel Bridges	- - - - - - - - - -	- - - - - - - -	- - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - -	- - - - - - - - - -
a) High Tensile (Regular and Weather Resisting Types)	0 to 25 - 3 Bolts, Nuts and Washers 26 to 50 - 4 Bolts, Nuts and Washers 51 to 90 - 5 Bolts, Nuts and Washers 91 to 150 - 6 Bolts, Nuts and Washers 151 to 280 - 7 Bolts, Nuts and Washers 281 to 500 - 9 Bolts, Nuts and Washers 501 to 1,200 - 11 Bolts, Nuts and Washers 1,201 to 3,200 - 13 Bolts, Nuts and Washers 3,201 to 150,000 - 15 Bolts, Nuts and Washers 150,001 and over - 15 Bolts, Nuts and Washers **These samples are for destructive testing and will not be returned.** Sample frequency is for each lot.	No	No	Yes	No	Yes	Section 27 Note 12 Note 30

ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED ***(TESTS TO BE MADE AT CENTRAL LABORATORY)***	**APPROVED PRODUCTS LIST**	**NEBRASKA QUALIFIED MATERIAL VENDORS LIST**	**MANUFACTURER CERTIFIED TESTS REQUIRED**	**MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED**	**BUY AMERICA COMPLIANCE REQUIRED**	**LOCATION OF ADDITIONAL INFORMATION**
Section 20 – Bridge Materials (continued)							
b) Low Carbon (Common)	- - - - - - - - - -	No	No	Yes	No	Yes	Section 27 Note 12 Note 30
12) Elastomeric Bearings	No - If these bearings have not been inspected by the Bridge Division, contact the Steel Fabrication Inspection Unit, at NDOT.SteelFab@nebraska.gov and they will be inspected on the jobsite prior to installation	No	No	Yes	No	Yes	Section 27 Note 30
A) Elastomeric Bearing Pads - Neoprene or Neoprene with Steel Shim	No – Random sampling may be performed by the Bridge Division, Steel Fabrication Inspection Unit NDOT.SteelFab@nebraska.gov.	No	No	Yes	No	Yes	Section 27 Note 30
B) Bearing Pads - Cotton Duck	No – Random sampling may be performed by the Bridge Division, Steel Fabrication Inspection Unit NDOT.SteelFab@nebraska.gov	No	No	Yes	No	No	- - - - - - - - - -
13) Fixed and Expansion Bearings, TFE Type	No - If these bearings have not been inspected by the Bridge Division, contact the Steel Fabrication Inspection Unit, NDOT.SteelFab@nebraska.gov, and they will be inspected on the jobsite prior to installation.	No	No	Yes	No	Yes	Section 27 Note 30
14) Confined Elastomeric Bearings (Pot Bearings)	- - - - - - - - - -	No	No	Yes	No	Yes	Section 27 Note 30
15) Strip Seal	- - - - - - - - - -	No	No	Yes	No	Yes	Section 27 Note 30
16) Epoxy/Resin Compounds	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
17) Grouting Material	- - - - - - - - - -	- - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -

ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED *(TESTS TO BE MADE AT CENTRAL LABORATORY)*	APPROVED PRODUCTS LIST	NEBRASKA QUALIFIED MATERIAL VENDORS LIST	MANUFACTURER CERTIFIED TESTS REQUIRED	MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED	BUY AMERICA COMPLIANCE REQUIRED	LOCATION OF ADDITIONAL INFORMATION
Section 20 – Bridge Materials (continued)							
A) Non-shrink Grout	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
B) Epoxy Type	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
18) Joint and Crack Sealing Fillers	- - - - - - - - - -	- - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
A) Cold Applied Type	- - - - - - - - - -	Yes	No	No	No	No	- - - - - - - - - -
B) Hot Poured Type	Samples are required if any physical characteristic of the material demonstrates non-compliance with the specification.	Yes	No	No	No	No	- - - - - - - - - -
19) Paint	- - - - - - - - - - .	Yes	No	No	No	No	- - - - - - - - - -
20) Preformed Joint Filler	- - - - - - - - - -	Yes	No	No	No	No	- - - - - - - - - -
21) Pressure Relief Joint Filler, Preformed Flexible Polyurethane	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
22) Reinforcement Bars	- - - - - - - - - -	- - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
A) Bars	Yes – Two samples six feet long from every bar designation and heat number unless shipped from tested and approved stock.	No	No	Yes	No	Yes	Section 27 Note 9 Note 30
B) Mechanical Splices	Yes – Two six-foot samples of each size of reinforcing bar with coupler/splice in the middle	No	No	Yes	No	Yes	Section 27 Note 30
C) Structural Wire Mesh	Yes – One sample 36 inches square from each 75,000 square feet of fabric unless shipped from tested and approved stock.	No	No	Yes	No	Yes	Section 27 Note 9 Note 30
D) Dowel Bars	- - - - - - - - - -	No	No	Yes	No	Yes	- - - - - - - - - -
23) Steel	- - - - - - - - - -	- - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
A) Piling, Sheet Piling, Shells for Cast in Place Piling & Crossbracing for Piling	- - - - - - - - - -	No	No	Yes	No	Yes	Section 27 Note 14 Note 30

ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED *(TESTS TO BE MADE AT CENTRAL LABORATORY)*	**APPROVED PRODUCTS LIST**	**NEBRASKA QUALIFIED MATERIAL VENDORS LIST**	**MANUFACTURER CERTIFIED TESTS REQUIRED**	**MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED**	**BUY AMERICA COMPLIANCE REQUIRED**	**LOCATION OF ADDITIONAL INFORMATION**
Section 20 – Bridge Materials (continued)							
B) Structural	- - - - - - - - - -	- - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
a) Substructure	- - - - - - - - - -	No	No	Yes	No	Yes	Section 27 Note 15 Note 30
b) Superstructure	- - - - - - - - - -	No	No	Yes	No	Yes	Section 27 Note 15 Note 30
24) Precast and Prestressed Concrete Units	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 13 Note 30 Policy 3
25) Prestressed Steel Wire Strand	Yes – One sample 12 feet long from each reel unless sampled at the manufacturer's plant by the testing agency of another state.	No	No	Yes	No	Yes	Section 27 Note 30
26) Prestressed Fine and Coarse Aggregate	Yes – One sample for quality tests.	No	Yes	No	No	No	- - - - - - - - - -
27) Structural Steel for Concrete Girder Bridges	No – Engineer will check the structural steel for compliance.	No	No	No	Yes	Yes	Section 27 Note 30
28) Structural Fasteners for Concrete Girder Bridges	- - - - - - - - - -	- - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
A) High Tensile (Regular and Weather Resisting Types)	0 to 25 - 3 Bolts, Nuts and Washers 26 to 50 - 4 Bolts, Nuts and Washers 51 to 90 - 5 Bolts, Nuts and Washers 91 to 150 - 6 Bolts, Nuts and Washers 151 to 280 - 7 Bolts, Nuts and Washers 281 to 500 - 9 Bolts, Nuts and Washers 501 to 1,200 - 11 Bolts, Nuts and Washers 1,201 to 3,200 - 13 Bolts, Nuts and Washers 3,201 to 150,000 - 15 Bolts, Nuts and Washers 150,001 and over - 15 Bolts, Nuts and Washers **These samples are for destructive testing and will not be returned.** Sample frequency is for each lot.	No	No	Yes	No	Yes	Section 27 Note 12 Note 30

ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED *(TESTS TO BE MADE AT CENTRAL LABORATORY)*	APPROVED PRODUCTS LIST	NEBRASKA QUALIFIED MATERIAL VENDORS LIST	MANUFACTURER CERTIFIED TESTS REQUIRED	MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED	BUY AMERICA COMPLIANCE REQUIRED	LOCATION OF ADDITIONAL INFORMATION
Section 20 – Bridge Materials (continued)							
B) Low Carbon (Common)	- - - - - - - - - -	No	No	Yes	No	Yes	Section 27 Note 12 Note 30
29) Epoxy Polymer Overlay	- - - - - - - - - -	- - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
A) Type III Epoxy	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
B) Crushed Siliceous Gravel	Quality: Yes – 60-pound project sample for central laboratory. Gradation: Yes – 10-pound sample for field testing.	No	No	No	No	No	- - - - - - - - - -
30) Cold Liquid-Applied Membrane	- - - - - - - - - -	No	No	Yes	No	No	- - - - - - - - - -
31) Cold Liquid-Applied Membrane – Aggregate	Quality: Yes – 60-pound project sample for central laboratory. Gradation: Yes – 10-pound sample for field testing.	No	No	No	No	No	- - - - - - - - - -
32) Preformed Waterproofing Membrane, Type1 and 2	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
33) Wick Drain	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30-
34) PG Binder/Primer	- - - - - - - - - -	No	No	No	Yes	No	- - - - - - - - - -
35) Bridge Deck Repair with Polymer Concrete	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
36) Glass Fiber Reinforced Polymer	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
37) Pile Jacket	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
38) Bridge Joint Nosing	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
39) Prefabricated Cast Steel Pile Points	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
40) Hot Applied Membrane – PG Binder	- - - - - - - - - -	No	No	No	Yes	No	- - - - - - - - - -

Materials Sampling Guide

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Lighting, Signal Materials, and Camera Towers

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ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED ***(TESTS TO BE MADE AT CENTRAL LABORATORY)***	**APPROVED PRODUCTS LIST**	**NEBRASKA QUALIFIED MATERIAL VENDORS LIST**	**MANUFACTURER CERTIFIED TESTS REQUIRED**	**MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED**	**BUY AMERICA COMPLIANCE REQUIRED**	**LOCATION OF ADDITIONAL INFORMATION**
Section 21 – Lighting, Signal Materials, and Camera Towers							
1) Bolts, Nuts and Washers	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
A) Anchor Bolts for Light, Signal, Span Wire, Combination Poles, and Camera Towers	- - - - - - - - - -	No	No	Yes	Yes	Yes	Section 27 Note 12 Note 16 Note 19 Note 30
B) Anchor Bolts for High Mast Towers and Overhead Sign Supports	Yes – The contractor shall furnish an extra bolt sample (including two nuts and two washers) from each heat of steel used on the project (or multiple projects) to the Materials & Research Division for destructive testing. (See standard specifications, supplemental specifications, and/or the project special provisions for further information.)	No	No	Yes	Yes	Yes	Section 27 Note 30
2) Electrical Items	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
A) Cast Iron Frames and Covers for Pull Boxes	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 17 Note 18 Note 19 Note 30
B) Cast Iron Junction Boxes	No – Project manager shall measure and determine quantity of galvanizing, if galvanized, and report to the Materials & Research Division.	No	No	No	Yes	Yes	Section 27 Note 17 Note 30
C) Conduit	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
a) Aluminum b) Fiber c) Plastic (HDPE, PP, PVC) d) Steel (Rigid, Flexible) e) Rigid Non-metallic	Yes – One sample two feet long of each size from each lot or batch, unless UL (Underwriters' Laboratory) or ETL (Intertek testing services) approved. If UL or ETL label is attached and physical dimensions are correct, the conduit may be accepted. The project manager shall report the results of the field inspection in AWP.	No	No	No	Yes	Yes	Section 27 Note 17 Note 30

ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED ***(TESTS TO BE MADE AT CENTRAL LABORATORY)***	**APPROVED PRODUCTS LIST**	**NEBRASKA QUALIFIED MATERIAL VENDORS LIST**	**MANUFACTURER CERTIFIED TESTS REQUIRED**	**MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED**	**BUY AMERICA COMPLIANCE REQUIRED**	**LOCATION OF ADDITIONAL INFORMATION**
Section 21 – Lighting, Signal Materials, and Camera Towers (continued)							
D) Light Poles and Towers	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
a) Conventional Light Pole	- - - - - - - - - -	No	No	Yes	No	Yes	Section 27 Note 16 Note 17 Note 19 Note 30
b) High Mast Towers	- - - - - - - - - -	No	No	Yes	No	Yes	Section 27 Note 16 Note 17 Note 19 Note 30
c) Camera Towers	- - - - - - - - - -	No	No	Yes	No	Yes	Section 27 Note 16 Note 17 Note 19 Note 30
d) Signal Standards	- - - - - - - - - -	No	No	Yes	No	Yes	Section 27 Note 16 Note 17 Note 19 Note 30
e) Span Wire Pole	- - - - - - - - - -	No	No	Yes	No	Yes	Section 27 Note 16 Note 17 Note 19 Note 30
f) Breakaway Base	- - - - - - - - - -	No	No	Yes	No	Yes	Section 27 Note 16 Note 17 Note 19 Note 30
E) Ground Rod	No – Project manager to measure diameter and length. Report in writing to the Materials & Research Division.	No	No	No	Yes	Yes	Section 27 Note 17 Note 30
F) Ground Wire	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 17 Note 30

ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED ***(TESTS TO BE MADE AT CENTRAL LABORATORY)***	**APPROVED PRODUCTS LIST**	**NEBRASKA QUALIFIED MATERIAL VENDORS LIST**	**MANUFACTURER CERTIFIED TESTS REQUIRED**	**MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED**	**BUY AMERICA COMPLIANCE REQUIRED**	**LOCATION OF ADDITIONAL INFORMATION**
Section 21 – Lighting, Signal Materials, and Camera Towers (continued)							
G) Electrical Wire and Cable	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 17 Note 30
H) Span Wire, Tie Wire and Guy Wire	Yes – One sample six feet long from each lot.	No	No	No	Yes	Yes	Section 27 Note 30
I) Electrical Equipment	See standard specifications, supplemental specifications and/or the project special provisions.	No	No	No	No	Yes	Section 27 Note 30
a) Photo-Electric Cells	- - - - - - - - - -	No	No	No	No	Yes	Section 27 Note 17 Note 30
b) Traffic Signals and Controllers	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 17 Note 30
c) Transformers	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 17 Note 30
d) Vehicle Detectors	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 17 Note 30
e) Luminaires	- - - - - - - - - -	No	Yes	No	No	Yes	Section 27 Note 17 Note 20 Note 30
f) Circuit Breakers	- - - - - - - - - -	No	No	No	No	Yes	Section 27 Note 17 Note 30
g) Fittings and Hardware	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 17 Note 30
h) Pull Boxes	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 17 Note 30
J) Galvanized Steel Wire	Yes – One sample 6 feet long from each lot of 5,000 feet or less and two samples from lots of 5,000 to 30,000 feet.	No	No	No	Yes	Yes	Section 27 Note 1 Note 30

ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED ***(TESTS TO BE MADE AT CENTRAL LABORATORY)***	**APPROVED PRODUCTS LIST**	**NEBRASKA QUALIFIED MATERIAL VENDORS LIST**	**MANUFACTURER CERTIFIED TESTS REQUIRED**	**MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED**	**BUY AMERICA COMPLIANCE REQUIRED**	**LOCATION OF ADDITIONAL INFORMATION**
Section 21 – Lighting, Signal Materials, and Camera Towers (continued)							
K) Grouting Material	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
a) Non-shrink Grout	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
b) Epoxy Type	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
L) Preformed Joint Filler	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
M) Poles (Wood)	No – Unless requested by the Materials & Research Division.	No	No	See Note	See Note	Yes	Section 27 Note 25 Note 30
N) Polyurethane Foam Footings	Yes – The manufacturer's recommended quantity of each component to provide one quart when mixed, unless shipped from tested and approved stock, or specified brands are being used.	No	No	No	Yes	Yes	Section 27 Note 19 Note 30
3) High Mast Lowering System	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
4) Overhead Sign Lighting	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
5) Paint Systems for High Mast/Overhead Structures	- - - - - - - - - -	Yes	No	No	No	No	- - - - - - - - - -
6) Rectangular Rapid Flashing Beacon	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
7) Solar Beacons	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
8) Optically Programmed Traffic Signals	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
9) Lighting Control Center	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 30

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ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED ***(TESTS TO BE MADE AT CENTRAL LABORATORY)***	**APPROVED PRODUCTS LIST**	**NEBRASKA QUALIFIED MATERIAL VENDORS LIST**	**MANUFACTURER CERTIFIED TESTS REQUIRED**	**MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED**	**BUY AMERICA COMPLIANCE REQUIRED**	**LOCATION OF ADDITIONAL INFORMATION**
Section 22 – Signing Materials							
1) Bolts, Nuts and Washers	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
A) High Tensile	Unless shipped from tested and approved stock, the contractor has the option to either provide certified mill test reports on material used or submit one sample bolt of each size to the central laboratory for destructive testing. The sample must be taken by the project manager and must be accompanied by a manufacturer's certificate of compliance. Materials shall not be approved for incorporation into the work until certified mill tests or sample test results and certificate of compliance are in hand.	No	No	Yes	No	Yes	Section 27 Note 12 Note 30
B) Low Carbon (Common)	No – Project manager to measure length and diameter. Galvanizing to be checked in the field by use of magnetic instrument for both bolts and nuts. Report results to Materials & Research Division.	No	No	No	Yes	Yes	Section 27 Note 12 Note 30
C) Sign Fasteners	Yes – Five bolts, nuts and washers from each lot of 500 fasteners unless shipped from tested and approved stock.	No	No	No	Yes	Yes	Section 27 Note 12 Note 30
D) Anchor	Yes – A bolt sample (including nuts and washers) from each heat of steel used on the project (or multiple projects) shall be submitted to the Materials & Research Division for destructive testing.	No	No	Yes	No	Yes	Section 27 Note 30
2) Brackets and Fasteners	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
A) Aluminum	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 21 Note 30
B) Steel	No – Galvanizing thickness to be checked in the field by the project manager and a report of results submitted to the Materials & Research Division.	No	No	No	Yes	Yes	Section 27 Note 21 Note 30
3) Acrylic Plastic Prismatic Reflectors	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 21 Note 30

ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED ***(TESTS TO BE MADE AT CENTRAL LABORATORY)***	**APPROVED PRODUCTS LIST**	**NEBRASKA QUALIFIED MATERIAL VENDORS LIST**	**MANUFACTURER CERTIFIED TESTS REQUIRED**	**MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED**	**BUY AMERICA COMPLIANCE REQUIRED**	**LOCATION OF ADDITIONAL INFORMATION**
Section 22 – Signing Materials (continued)							
4) Reflective Sheeting	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 21 Note 30
5) Extrusheet	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 21 Note 30
6) Sheet Aluminum	- - - - - - - - - -	No	No	Yes	No	Yes	Section 27 Note 21 Note 30
7) Sheet Metal Sleeves	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 21 Note 30
8) Signing Supports and Structures	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
A) Aluminum	- - - - - - - - - -	No	No	Yes	No	Yes	Section 27 Note 21 Note 30
B) Steel	No – Galvanizing thickness to be checked in the field by the project manager and a report of results submitted to the Materials & Research Division.	No	No	Yes	No	Yes	Section 27 Note 21 Note 30
C) Wood Posts	No – Unless requested by the Materials & Research Division.	No	No	See Note	See Note	Yes	Section 27 Note 25 Note 30
9) Sign Supports, Overhead	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
A) Main Members	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
a) Truss Chords and Bracing	- - - - - - - - - -	No	No	Yes	No	Yes	Section 27 Note 30
b) Chord End Flanges	- - - - - - - - - -	No	No	Yes	No	Yes	Section 27 Note 30
c) Vertical Posts and Bracing	- - - - - - - - - -	No	No	Yes	No	Yes	Section 27 Note 21 Note 30
d) Catwalk Supports and Post Bases	- - - - - - - - - -	No	No	Yes	No	Yes	Section 27 Note 21 Note 30
B) Secondary Members	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
a) Catwalk Grating	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 30

ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED *(TESTS TO BE MADE AT CENTRAL LABORATORY)*	APPROVED PRODUCTS LIST	NEBRASKA QUALIFIED MATERIAL VENDORS LIST	MANUFACTURER CERTIFIED TESTS REQUIRED	MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED	BUY AMERICA COMPLIANCE REQUIRED	LOCATION OF ADDITIONAL INFORMATION
Section 22 – Signing Materials (continued)							
b) Railing	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 30
c) Bolts	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 30
d) U-Bolts	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 30
e) J-Bolts	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 30
f) Chains	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 30
g) Misc. Hardware	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 30

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ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED ***(TESTS TO BE MADE AT CENTRAL LABORATORY)***	**APPROVED PRODUCTS LIST**	**NEBRASKA QUALIFIED MATERIAL VENDORS LIST**	**MANUFACTURER CERTIFIED TESTS REQUIRED**	**MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED**	**BUY AMERICA COMPLIANCE REQUIRED**	**LOCATION OF ADDITIONAL INFORMATION**
Section 23 – Traffic Control							
1) Barricade Warning Sign, Drum, and Tubular Post Reflective Material	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
A) Barricades – Permanent	Reflective material shall be tested in the field, by field personnel and the reflectometer test results reported in AWP.	No	No	No	Yes	Yes	Section 27 Note 30
B) Barricades/Plastic Drums – Temporary	Yes – When fewer than 50 devices are furnished, test the retroreflectivity of one of every five, or a minimum of two each, whichever is greater. When 50 or more of any one device is furnished, test the retroreflectivity of one of every ten.	No	No	No	No	No	- - - - - - - - - -
2) Barricade Warning Lights	- - - - - - - - - -	Yes	No	No	No	No	- - - - - - - - - -
3) Thermoplastic Pavement Marking	See Special Provisions	Yes	No	No	No	Yes	Section 27 Note 30
4) Glass Beads for Thermoplastic Pavement Marking	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 30
5) Polyurea Pavement Marking	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
6) Glass Beads for Polyurea Pavement Marking	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 30
7) Wet Reflective Polyurea Pavement Marking	See Special Provisions	Yes	No	No	No	Yes	Section 27 Note 30
8) Wet Reflective Media	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
9) Preformed Pavement Marking, Type IV	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
10) Wet Reflective Preformed Pavement Marking, Type IV	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30

ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED ***(TESTS TO BE MADE AT CENTRAL LABORATORY)***	**APPROVED PRODUCTS LIST**	**NEBRASKA QUALIFIED MATERIAL VENDORS LIST**	**MANUFACTURER CERTIFIED TESTS REQUIRED**	**MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED**	**BUY AMERICA COMPLIANCE REQUIRED**	**LOCATION OF ADDITIONAL INFORMATION**
Section 23 – Traffic Control (continued)							
11) Temporary Pavement Marking Tape (Type I, II)	- - - - - - - - - -	Yes	No	No	No	No	- - - - - - - - - -
12) Permanent Pavement Marking, Type Paint	Yes – • When the combined quantity of all colors exceeds 5,000 linear feet, a sample will be submitted for each individual color.When the batch/lot is from tested and approved stock, a 1-quart sample is required and will be sampled from the truck When the batch/lot is not from tested and approved stock, a 1-quart sample is required and will be sampled from a tote on the project	No	Yes	No	Yes, for each color	No	Section 27, Note 29
13) Glass Beads for Permanent Pavement Marking Type Paint	Yes – • When the pay quantity exceeds 5,000 linear feet, a 1-quart sample or one 50-pound bag is required on the project, unless shipped from tested and approved stock	No	Yes	No	Yes	Yes	Section 27, Note 29 Note 30
14) Temporary Pavement Marking Tape, Temporary Pavement Marking, Removable Wet Reflective Tape	- - - - - - - - - -	Yes	No	No	No	No	- - - - - - - - - -
15) Temporary Pavement Marking Tape, Removable Black Tape	- - - - - - - - - -	Yes	No	No	No	No	- - - - - - - - - -
16) Raised Pavement Markers (Temporary)	- - - - - - - - - -	Yes	No	No	No	No	- - - - - - - - - -
17) Raised Pavement Markers (Permanent)	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
18) Black Aggregate	- - - - - - - - - -	No	No	No	Yes	No	- - - - - - - - - -
19) Tubular Posts	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
20) Opposing Lane Dividers	- - - - - - - - - -	Yes	No	No	No	No	- - - - - - - - - -

ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED ***(TESTS TO BE MADE AT CENTRAL LABORATORY)***	**APPROVED PRODUCTS LIST**	**NEBRASKA QUALIFIED MATERIAL VENDORS LIST**	**MANUFACTURER CERTIFIED TESTS REQUIRED**	**MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED**	**BUY AMERICA COMPLIANCE REQUIRED**	**LOCATION OF ADDITIONAL INFORMATION**
Section 23 – Traffic Control (continued							
21) Changeable Message Sign	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
22) Flashing Arrow Panel (Temporary)	- - - - - - - - - -	Yes	No	No	No	No	- - - - - - - - - -
23) Moveable Barrier System	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 30
24) Non-Perforated Square Steel Tube Post	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
25) Channelizing Block	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
26) Highway Signs – Types A, B, C	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 30
27) Contractor Furnished Signs	Yes – Test the retroreflectivity of one of every five signs.	No	No	No	No	No	- - - - - - - - - -
28) Vehicle Detector Loop Sealant	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30

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Item or Group	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED ***(TESTS TO BE MADE AT CENTRAL LABORATORY)***	**APPROVED PRODUCTS LIST**	**NEBRASKA QUALIFIED MATERIAL VENDORS LIST**	**MANUFACTURER CERTIFIED TESTS REQUIRED**	**MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED**	**BUY AMERICA COMPLIANCE REQUIRED**	**LOCATION OF ADDITIONAL INFORMATION**
Section 24 – Roadside Development and Erosion Control							
1) Erosion Control Fabrics	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
2) Rock Riprap	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - -	- - - - - - - - - -
A) Rock Riprap	- - - - - - - - - -	No	Yes	No	No	No	Section 27 Note 1 Note 26
B) Filter Fabric for Rock Riprap	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 1 Note 26 Note 30
3) Filter Fabric for Pipe Underdrains	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
4) Subsurface Drainage Matting	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
5) Geocell Cellular Confinement System	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
6) Gabions	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - -	- - - - - - - - - -
A) Gabion Baskets	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
B) Gabion Stone Fill	- - - - - - - - - -	No	Yes	No	No	No	Section 27 Note 26
7) Revet Mattress	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - -	- - - - - - - - - -
A) Revet Mattress	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
B) Revet Mattress Stone Fill	- - - - - - - - - -	No	Yes	No	No	No	Section 27 Note 26
8) Turbidity Barrier	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
9) Soil Amendment	- - - - - - - - - -	Yes	No	No	No	No	- - - - - - - - - -
10) Soil Tackifier	- - - - - - - - - -	Yes	No	No	No	No	- - - - - - - - - -
11) GeoFabric	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
12) GeoGrid	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
13) Transition Mat	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
14) Track Out Mat	- - - - - - - - - -	Yes	No	No	No	No	- - - - - - - - - -

Item or Group	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED ***(TESTS TO BE MADE AT CENTRAL LABORATORY)***	**APPROVED PRODUCTS LIST**	**NEBRASKA QUALIFIED MATERIAL VENDORS LIST**	**MANUFACTURER CERTIFIED TESTS REQUIRED**	**MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED**	**BUY AMERICA COMPLIANCE REQUIRED**	**LOCATION OF ADDITIONAL INFORMATION**
Section 24 – Roadside Development and Erosion Control							
15 Erosion Control Staples	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30

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ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED *(TESTS TO BE MADE AT CENTRAL LABORATORY)*	APPROVED PRODUCTS LIST	NEBRASKA QUALIFIED MATERIAL VENDORS LIST	MANUFACTURER CERTIFIED TESTS REQUIRED	MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED	BUY AMERICA COMPLIANCE REQUIRED	LOCATION OF ADDITIONAL INFORMATION
Section 25 – Miscellaneous Materials							
1) Automatic Flood Control Gates	----------	No	No	No	Yes	Yes	Section 27 Note 18 Note 30
2) Bar Grates	----------	No	No	No	Yes	Yes	Section 27 Note 30-
3) Bricks	----------	No	No	Yes	Yes	No	Section 27 Note 1
4) Concrete Filler Block	----------	No	No	Yes	Yes	No	Section 27 Note 1
5) Damp Proofing	----------	----------	----------	----------	----------	----------	----------
A. Asphalt	----------	No	No	No	Yes	No	----------
B. Asphalt Primer	----------	No	No	No	Yes	No	----------
6) Flexible Delineators	----------	Yes	No	No	No	Yes	Section 27 Note 30
7) Delineators, Chevron, and U-Channel	----------	----------	----------	----------	----------	----------	----------
A) Fasteners	Yes – Five bolts, nuts and washers from each lot of 500 fasteners unless shipped from tested and approved stock.	No	No	No	Yes	Yes	Section 27 Note 1 Note 12 Note 22 Note 30
B) Reflectors	----------	Yes	No	No	No	Yes	Section 27 Note 1 Note 30
C) Posts	Yes – One post of each size from each lot or batch unless shipped from tested and approved stock.	No	No	No	Yes	Yes	Section 27 Note 1 Note 23 Note 30
8) Detectable Warning Panel	----------	Yes	No	No	No	Yes	Section 27 Note 30
9) Glass Fiber Mulch	----------	No	No	Yes	No	Yes	Section 27 Note 30
10) Gray Iron Castings (Cast Iron Grates, Frames, Covers, etc)	----------	No	No	No	Yes	Yes	Section 27 Note 18 Note 30

ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED *(TESTS TO BE MADE AT CENTRAL LABORATORY)*	APPROVED PRODUCTS LIST	NEBRASKA QUALIFIED MATERIAL VENDORS LIST	MANUFACTURER CERTIFIED TESTS REQUIRED	MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED	BUY AMERICA COMPLIANCE REQUIRED	LOCATION OF ADDITIONAL INFORMATION
Section 25 – Miscellaneous Materials (continued)							
11) Pipe	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
A. Copper	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 30
B. Plastic	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 30 *
C. Steel	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 30
D) Wrought Iron	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 30
E) Ductile Iron Pipe and Fittings	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 30
12) Cold-Drawn Steel Wire	Yes – One sample four feet long from each ten tons or fraction thereof of each size of wire.	No	No	No	Yes	Yes	Section 27 Note 30
13) Prestressed Steel Wire Strand	Yes – One sample twelve feet long from each reel unless sampled at the manufacturer's plant by the testing agency of another state.	No	No	Yes	No	Yes	Section 27 Note 30
14) Right of Way Markers	No – Project manager shall measure, test and report unless shipped from tested and approved stock.	No	No	No	Yes	Yes	Section 27 Note 24 Note 30
15) Waterstop	Yes – One sample six inches in length unless shipped from tested and approved stock.	No	No	No	No	Yes	Section 27 Note 30
16) Wood Products	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
A) Lumber	No – Unless requested by the Materials & Research Division.	No	No	See Note	See Note	Yes	Section 27 Note 1 Note 25 Note 30
B) Timber	No – Unless requested by the Materials & Research Division.	No	No	See Note	See Note	Yes	Section 27 Note 1 Note 25 Note 30
17) Hot Pour Sealant	Samples are required if any physical characteristic of the material demonstrates non-compliance with the specifications.	Yes	No	No	No	No	- - - - - - - - - -

*See Section 29, Policy 10, Policy Concerning Plastic Pipe Certification and Approval

ITEM OR GROUP	SAMPLE REQUIRED *(TESTS TO BE MADE AT CENTRAL LABORATORY)*	APPROVED PRODUCTS LIST	NEBRASKA QUALIFIED MATERIAL VENDORS LIST	MANUFACTURER CERTIFIED TESTS REQUIRED	MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED	BUY AMERICA COMPLIANCE REQUIRED	LOCATION OF ADDITIONAL INFORMATION
Section 25 – Miscellaneous Materials (continued)							
18) Inertial Barrier Modules	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
A) Inertial Barrier Barrels	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
B) Fill Material for Inertial Barrier Modules	Gradation: One sample for gradation tests each 100 cubic yards or fraction thereof. (The recommended sample size is 25 pounds)	No	No	No	No	No	- - - - - - - - - -
19) High Friction Surface Treatment	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -
A. Aggregate	Yes, 60-pound sample taken by field personnel	No	No	No	Yes	No	Section 27 Note 27
B. Polymer Binder Resin	- - - - - - - - - -	No	No	Yes	Yes	Yes	Section 27 Note 27 Note 30
20) Concrete Face Panels	- - - - - - - - - -	Yes	No	No	No	No	- - - - - - - - - -

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 25 – Miscellaneous Materials (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
21) Culvert Sandfill	Quality & Gradation	----------	One sample for gradation tests each 100 cubic yards or fraction thereof. The recommended sample size is 25 pounds. Project personnel will supply the 10- and 60-pound samples when needed to perform the testing shown under the central laboratory column. The samples shall be taken at the project.	----------	One 60-pound sample for quality tests, if so designated by the Aggregate Laboratory Manager or when changes in quality or characteristics occur One 10-pound sample per project for gradation test (Duplicate of sample tested in field)	Section27 Note 1 Note 4
22) Sand and Sawdust for Absorption Field	Mix Design & Permeability	----------	Project personnel will supply the 60-pound sample of sand and the 20-pound sample of sawdust needed to perform the testing shown under the column. The samples shall be taken at the project or mixing site.	----------	One 60-pound sample of sand and one 20-pound sample of sawdust pre-construction samples for mix design approval.	----------

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements				
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY NDOT			LOCATION OF ADDITIONAL INFORMATION
Section 25 – Miscellaneous Materials (continued)			**FIELD PERSONNEL**	**BRANCH LAB**	**CENTRAL LAB**	
23) Sand for Absorption Field	Gradation	- - - - - - - - - -	A minimum of two gradation tests per project. The recommended sample size is 25 pounds. Project personnel will supply the 10-pound sample needed to perform the testing shown under the central laboratory column. The sample shall be taken at the project.	- - - - - - - - - -	One 10-pound sample per project for gradation.	- - - - - - - - - -
24) Sawdust for Absorption Field	Gradation	- - - - - - - - - -	A minimum of two gradation tests per project. The recommended sample size is 10-pounds. Project personnel will supply the 10-pound sample needed to perform the testing shown under the central laboratory column. The sample shall be taken at the project.	- - - - - - - - - -	One 10-pound sample per project for gradation.	- - - - - - - - - -
25) Com-bined Sand/ Sawdust for Absorption Field	Permeability	- - - - - - - - - -	Project personnel will supply the 60-pound sample needed to perform the testing shown under the central laboratory column. The sample shall be taken at the project.	- - - - - - - - - -	One 60-pound construction sample for permeability test.	- - - - - - - - - -

ITEM OR GROUP	Minimum Material Certificate, Test and Inspection Requirements						
	SAMPLE REQUIRED *(TESTS TO BE MADE AT CENTRAL LABORATORY)*	APPROVED PRODUCTS LIST	NEBRASKA QUALIFIED MATERIAL VENDORS LIST	MANUFACTURER CERTIFIED TESTS REQUIRED	MANUFACTURER CERTIFICATION OF COMPLIANCE REQUIRED	BUY AMERICA COMPLIANCE REQUIRED	LOCATION OF ADDITIONAL INFORMATION
Section 25 – Miscellaneous Materials (continued)							
26) Fabric Reinforcement Crack Repair	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
27) Fiberglass Grid	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
28) GeoFabric	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
29) GeoFoam	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
30) GeoGrid	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
31) Non-Woven Pavement Overlay Fabric	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
32) Polyester Geogrid-Fabric Composite	- - - - - - - - - -	Yes	No	No	No	Yes	Section 27 Note 30
33) Dual Mailbox Support Bracket (Expired 9/30/2025)							
34) Mailbox Post and Mounting Assembly	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 30
35) Pavement Lifting Foam	- - - - - - - - - -	No	No	Yes	No	No	- - - - - - - - - -
36) Sump Pump (Permanent)	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 30
37) Closed Circuit Television Camera	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 30
38) Bollard	- - - - - - - - - -	No	No	No	Yes	Yes	Section 27 Note 30

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Building Materials

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Section 26
Building Materials
Building Inspection and Acceptance

Inspection of buildings involves checking many items that are not normally encountered in the inspection of highway work. Any questions concerning building inspection should be directed to the Highway Architect of the Roadway Design Division (Rest Area buildings) or to the Architecture Section of the Capital Facilities and Transportation Services Division (all other buildings).

Upon project completion, the project manager shall advise the Materials & Research Division, in writing, that all materials or items used were approved for use on the basis of tests, field inspection, or that approval was given by the Highway Architect or Architecture Section for use.

A copy of this letter should be sent to the Highway Architect or Architecture Section.

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Note 1
Sampling and Testing Small Quantities of Non-critical Materials

Certain exceptions to the normal sampling and testing procedures may be made where quantities of non-critical items or materials are too small to justify the cost of testing or inspection. These exceptions in sampling and testing are intended for small quantities of materials whose positions on the project are not structurally critical. Such procedures are not to be permitted in materials for major structures, permanent mainline or ramp pavements, or other structurally critical items where use of unsound materials might significantly influence the performance, strength or durability of that item, or the public safety.

The project manager must notify Materials and Research Materials Final Reviewer prior to construction and request approval for use of a small quantity of material. Materials and Research will evaluate each request and determine eligibility on a case-by-case basis. If approval is granted, the project manager shall document the exclusion of sampling and testing in AWP.

Small-quantity exceptions may only be used when the material involved is non-critical and the quantity is insufficient to justify the cost of sampling, testing, or inspection. When a small quantity exception is applied, the project manager shall record the appropriate documentation on the affected line item in accordance with Department materials acceptance requirements.

The following tabulation indicates the approximate maximum quantities of material, except Portland cement concrete and asphaltic concrete that may be accepted under the methods indicated above:

a. Aggregates (for Portland cement concrete and asphaltic concrete quality testing of aggregate is required) – Not to exceed approximately 200 cubic yards per day nor more than approximately 500 cubic yards per project. Rock riprap and Gabion stone fill shall not exceed 1,000 tons per project.

b. Bituminous Mixtures (cold mix) – Not to exceed approximately 50 tons per day nor more than approximately 250 tons per project.

c. Asphaltic Oils and Emulsified Asphalts – Not to exceed approximately 1,500 gallons of each type per project.

d. Paint – Not to exceed approximately five gallons of each type per project. Brand name paints of the color specified and the weights and analysis on the container label should be the basis for acceptance.

e. Dimensional Lumber (2x4, 1x6, etc.) – Recognized commercial grades only may be used.

f. Masonry Items – Not to exceed approximately 100 pieces of each item. Acceptance should be based on physical measurements for nominal size and visual inspection. Masonry items may include but are not exclusive to bricks, concrete blocks, etc.

Portland cement concrete for the items and approximate quantities listed below may be accepted by entering a sample in AWP and selecting the ‘Small Quantities of Non-critical Materials’ test method:

a. Mix designs are not required for small quantities of non-critical items.

b. Sidewalks – not to exceed 200 cubic yards per day

c. Median Surfacing – not to exceed 200 cubic yards per day

d. Concrete Base Course – not to exceed 200 cubic yards per day

e. Concrete Base Course Widening – not to exceed 200 cubic yards per day

f. Curb and Gutter – not to exceed approximately 500 linear feet per project, or 50 cubic yards per day, for more than two consecutive days

g. Slope Paving and Headers – not to exceed 50 cubic yards

h. Paved Ditch (intermittent water flow)

i. Single Culvert Headwalls and Collars

j. Catch Basins, Manhole Bases and Inlets

k. Concrete Ditch Checks

l. Post Hole Concrete (Fence and Guardrail)

m. Miscellaneous Concrete – Concrete placements of five cubic yards or less and which are non-critical. Non-critical refers to placements that will not be subject to traffic loading and for which failure is not likely to disrupt traffic or pose a threat of harm to the traveling public.

Acceptance under this system shall be based on the following:

a. Delivery tickets shall accompany each load.

b. The concrete plant must comply with the specifications.

c. Only state tested and approved aggregates, cements and admixtures may be used.

d. Project personnel will perform necessary testing on any material they feel may be of inferior quality.

e. The project manager will determine that the concrete for these items is from a known reliable source and fulfills the requirements for the purpose intended.

The above system is intended to provide a method whereby the project manager may be relieved of sampling and testing small quantities of material which are placed in such a location within the project that the absence of sampling and testing does not materially affect the principle of sound engineering control. This program includes, but is not exclusive to, the items in the list above. Many other miscellaneous minor items (e.g., 3 or 4 posts, a few bolts, washers, nuts, a few pieces of pipe, short pieces of wire, a few pieces of reinforcing steel, a few feet of fencing material, etc.) will be within the definition of the above but cannot all be listed inasmuch as location on the project will determine the need to sample and test.

Note 2
Asphaltic Oils, Performance Graded Binders, and Emulsified Asphalt

Acceptance Procedures:

General – The project manager must send his/her address to each supplier which is expected to ship asphaltic material to projects under his/her supervision.

Since payment for the asphalt materials is based on net tons or gallons shown on the supplier's certificate of compliance, it is important that the project manager check each truck to make sure that it has been completely emptied.

Only certified suppliers may furnish asphaltic material to the state. Certified suppliers have been instructed to furnish a copy of their certificate of compliance to the project manager for each truck shipped to the project.

The certificate of compliance is to be sent with the truck driver for delivery to the project manager.

A certificate of compliance is required and must certify:

a) The specific gravity at 60°F of the material.

b) Any special handling/storage requirements.

c) Net gallons at 60°F of the shipment.

d) That the material meets the specification requirements.

e) Certificates of compliance must be signed by an authorized employee of the supplier.

Asphaltic materials may be used immediately on the basis of the supplier's certificate of compliance.

A bill of lading may serve as a certificate of compliance, provided it contains all the required information.

Samples shall be taken in accordance with AASHTO R66, as applicable.

The contractor's certified sampling technician, under the direction of Nebraska Department of Transportation personnel, will sample bituminous materials.

The contractor's certified sampling technician will fill out the DR Form 184, Certified Sample Registration, whenever a sample is taken. The Certified Sample Registration form will be located at the plant site.

Performance graded binders shall be sampled from the line between the storage tank and the mixer, or from the storage tank itself supplying material to that line.

Note 3
Asphaltic Concrete Small Quantities

The testing requirements of asphaltic concrete identified in the contract for quantities of less than one lot (5,000 tons) may be modified by the district construction engineer.

When testing requirements are modified, the method of acceptance, with agreement of the contractor, will be established by the engineer.

Note 4
Quality Tests of Aggregates

In order to reduce the duplication of quality tests of aggregates from the same source by the central laboratory, the Aggregate Laboratory Manager will request sample material.

For verification testing, a 10-lb sample will be required on all sand-gravel aggregates. The sand equivalent test is required on all dry pit materials.

Note 5
Crushed Rock Aggregate Inspected at the Source

This note was removed effective January 1, 2013.

Note 6
Portland Cement Concrete

The minimum frequency for determining the yield, air content, and gradation of aggregates used is based on the average daily production. In some instances, for adequate control, it may be necessary to perform the required test more often.

Concrete Cylinders Size – 4x8 inch cylinder molds must be used on all projects. When testing 4x8 cylinders, 2 cylinders will be averaged for one test result. Compressive strength testing is required until the design strength is obtained; not to exceed specification time constraints. For bridge decks, a 28-day compressive strength is required.

Shotcrete – Mortar Cubes/Concrete Cores: Three cubes or cores will be tested and averaged for the final design compressive strength at 28 days.

Note 7
Concrete Chemical Admixtures

All types and brands of admixtures are to be recorded on the PCC proportioning report template.

If a concrete admixture is of a questionable nature, the ready mix producer must contact the company representative to address the concerns regarding the admixture. The findings of this investigation will be given to the project manager who must give his approval before the admixture can be used.

Note 8
Liquid Curing Compound

This material is pretested by the Materials & Research Division Central Laboratory with samples coming directly from the manufacturer. Upon passing the required tests, the cure compound is approved for one year from the date of approval. Approved lot numbers can be found on the Department of Transportation Materials & Research Division website. Curing compound lot numbers not found must be sampled, tested and approved before being used. The project manager will notify the Materials & Research Division as to which project the material is to be used on.

Note 9
Reinforcing Steel, Bars, and Fabric

Generally, reinforcing steel supplied by Nebraska manufacturers or fabricators is sampled and tested by the central laboratory, which maintains a stock record of tested material at these plants. This pre-approved stock material may be sent by the supplier directly to the project, provided the supplier sends an approved NDOT shipping report along with the load. This completed shipping report, signed by the supplier, is sent directly to the project manager with a copy provided for the contractor. The project manager is responsible for documenting and authorizing this shipping report in AWP and OnBase.

Reinforcing steel may occasionally be furnished directly to the project from a manufacturer without being previously tested by the central laboratory. In this case, certificates should be documented in AWP and OnBase and samples forwarded to the central laboratory as prescribed by the materials sampling guide for review and authorization. Reinforcing steel furnished under these circumstances should not be used until tests are completed and authorized by Materials & Research.

Note 10
Beam and Cable Guardrail and Fittings

Beam and cable guardrail and associated hardware furnished by each supplier is subject to random testing by Materials & Research. Any material shipped from approved guardrail suppliers to state projects will not require any additional sampling, testing, or certification. Pre-approved material may be sent by the supplier directly to the project, provided the supplier sends an approved NDOT shipping report along with the load. This completed shipping report, signed by the supplier, is sent directly to the project manager with a copy provided for the contractor. The project manager is responsible for documenting and authorizing this shipping report in AWP and OnBase.

Note 11
Metal Culvert Pipe Field Inspection and Reporting

Metal culvert pipe and associated hardware furnished by each supplier is subject to random testing at the suppliers' facility by Materials & Research. Any material shipped from these approved metal culvert suppliers' stock will not require any additional sampling, testing, or certification. Pre-approved stock material may be sent by the supplier directly to the project, provided the supplier sends an approved NDOT shipping report along with the load. This completed shipping report, signed by the supplier, is sent directly to the project manager with a copy provided for the contractor. The project manager is responsible for documenting and authorizing this shipping report in AWP and OnBase.

The pipe may be approved for use as soon as the project manager verifies that the material received is as described on the shipping report and the pipe has not been damaged in shipment or handling. Any corrections or notes should be made on the project manager's copy of the shipping report.

Note 12
Bolts, Nuts and Washers, and Structural Fasteners

Bolts supplied to Nebraska projects are sampled and tested by the central laboratory and/or the NDOT Bridge Fabrication Inspection Unit. The NDOT central laboratory maintains a stock record of tested material at various fabricators and suppliers. This pre-approved stock material may be sent by the fabricator/supplier directly to the project, provided the supplier sends an approved NDOT shipping report along with the shipment. This completed shipping report, signed by the supplier, is sent directly to the project manager with a copy provided for the contractor. The project manager is responsible for documenting and authorizing this shipping report in AWP and OnBase.

Note 13
Precast and Prestressed Concrete Units (Bearing Piling, Sheet Piling, Girders, etc.)

Precast and prestressed concrete units are usually produced by commercial plants within the state. Inspection of these units is generally provided by Department of Transportation personnel.

When shipment from the fabricating plant is made to a project, a shipping report DR Form 214, Report of Shipment of Precast and Prestressed Concrete Units from Tested Stock, is completed by the inspector with copies to the Materials & Research Division, division engineer, and the project manager. A preliminary copy shall accompany the units with the driver of the hauling vehicle.

The shipping report gives the inspector's coding of each unit shipped and is verification of acceptability provided the units shipped show no evidence of damage incurred through handling enroute to the project.

No unit received on the project shall be used in the work until the project manager has checked the inspector's identification as shown on the shipping report with that shown on the units.

Note 14
Steel Bearing Piling, Steel Sheet Piling and Steel Shells for Cast-in-Place Piling

These items are accepted at the time of manufacture. The contractor shall be required to supply the project manager with the certified test reports when the material is delivered to the project. The project manager shall check the heat numbers shown on these reports with those stamped on the piling. The project manager shall document said reports in AWP and OnBase for review and authorization by the Materials & Research Division.

Note 15
Structural Steel for Superstructure, Substructure, and Handrail

Structural steel is accepted for use on the basis of physical and chemical tests made at the time of manufacture. The department inspector at the fabrication plant will obtain, from the fabricator, the certified mill tests representing the structural shapes being fabricated. The inspector will obtain a certificate of compliance listing all other items which are considered as miscellaneous, and for which mill tests cannot be obtained. These miscellaneous items include tie rods and turnbuckles, bearing devices, nose angles, roadway devices and dam plates, armor angles, floor drains, and all bolts except high strength bolts, etc. The inspector will review all mill tests for compliance with the specifications and inspector approval will be stamped or written and signed by the department inspector. The project manager shall not accept for use any structural steel shapes until he/she has received the shop inspection reports and reviewed mill tests or certificates of compliance. All mill test reports shall show the project number for which material will be used. The department inspector is responsible for entering all mill tests, certificates, and other reports in AWP and OnBase.

Note 16
Combination Mast Arm Signal and Lighting Poles, Mast Arm Signal Poles, Span Wire Poles, Pedestal Traffic Signal Poles, and Light Poles, and Camera Towers

The standard specifications require that the manufacturer of the pole or tower supply the anchor bolts, anchor bolt covers, pole bases, and all miscellaneous hardware. The pole or tower

manufacturer shall furnish a certificate stating that the pole or tower and anchor bolts shall be capable of supporting the required load under the specified design criteria and shall withstand the specified wind and ice load. The pole or tower manufacturer shall furnish certificates of compliance for of any materials used in the manufacturer of the pole and its accessories to the Materials & Research Division. Pole or tower structural elements need a certificate of test with a Buy America statement. See Note 30 for additional information.

Note 17
Electrical Items

Electrical items are accepted for use on the basis of sample inspection and testing, receipt of certified test reports, or certificates of compliance. Where required, certified tests or certificates of compliance shall be furnished to the project manager by the contractor. The project manager shall forward the certified tests and/or certificates of compliance to the Materials & Research Division for review and distribution.

The project manager shall not accept or permit the installation of any electrical items until he has received the required tests and/or certification documents indicating approval for use through communication with the Materials & Research Division, Traffic Engineering or concerned authority, pending receipt of the documentation. Special attention shall be given to those items which will not be readily available to inspection during or after completion of the work or where removal and replacement under adverse conditions such as under traffic, etc., would be an inconvenience to the contractor, the state, or the traveling public.

Note 18
Gray Iron Castings (Cast Iron Grates, Frames, Pull Box Frames and Covers, Junction Boxes, etc.)

Gray iron castings may be sent directly to the project provided the supplier sends an approved NDOT shipping report along with the load. This completed shipping report, signed by the supplier, is sent directly to the project manager with a copy provided for the contractor.

Cast iron materials are not supplied from tested stock, therefore, the project manager shall obtain the manufacturer's certificate of compliance for this material from the contractor prior to installation. The project manager is responsible for documenting and authorizing the shipping report and associated certificates in AWP and OnBase.

Finished castings are not inspected prior to shipment, therefore, acceptance should be based on field inspection showing good workmanship and compliance with the dimensional and weight requirements specified in the contract documents.

Note 19
Source of Certificate of Compliance

The certificate of compliance must be from the manufacturer, not the supplier.

Note 20
Luminaire Settings

Luminaire sockets have adjustments that provide for a choice of light distribution patterns. The project manager shall inspect the settings on each luminaire socket and report this setting to the lighting engineer. Adequate descriptive literature is provided with each type of luminaire to determine the setting. The report may be in the form of a letter, sketch, etc.

Note 21
Signing Items

Signing items are accepted for use on the basis of sample inspection, testing and receipt of certified test reports, and certificates of compliance. Sample inspection and testing will be performed by Traffic Engineering and Materials & Research Divisions. Where required, certified tests or certificates of compliance shall be furnished by the contractor to the project manager. The project

manager shall forward the certified tests and certificates of compliance to the Materials & Research Division for approval and distribution.

The project manager shall not accept signing items for use until he has received the required tests and/or certification documents indicating approval for use or has verified acceptability of the signing items for use through communication with the Materials & Research Division, the Traffic Engineering Division, or concerning authority, pending receipt of the documentation.

Note 22
Reflectors and Fasteners

Removed 7/1/2021

Note 23
Delineator Posts

Pre-approved delineator posts may be sent by the supplier directly to the project, provided the supplier sends an approved NDOT shipping report along with the load. This completed shipping report, signed by the supplier, is sent directly to the project manager, with a copy provided for the contractor. The project manager is responsible for documenting and authorizing this shipping report in AWP and OnBase. NDOT inspection tags will also be included with the shipment.

Posts delivered to a project which are not supplied from a previously tested and approved stock, must be sampled by field personnel and submitted to Materials & Research for testing and approval.

Note 24
Right of Way Markers

These units are usually produced by commercial plants within the state. Inspection of these units is generally provided by department personnel.

When shipment from the fabricating plant is made to a project, a shipping report (Report of Shipment of Precast Concrete ROW Markers From Approved Stock) is completed by the inspector with copies to the Materials & Research Division, district engineer, and project manager.

The shipping report gives the lot number and quantity shipped and is verification of acceptability provided the units shipped show no evidence of damage incurred through handling enroute to the project.

Note 25
Treated and Untreated Timber Piling, Treated Timber Sheet Piling, Fence Posts, Treated and Untreated Lumber, Treated and Untreated Timber, Wood Guardrail Posts, Offset Blocks, Treated Poles and Sign Posts

These materials are normally accepted on the basis of certificates of compliance from the producer and treater or certificate tests from a commercial testing laboratory arranged for by the supplier and approved by the Materials & Research Division.

Materials accepted on the basis of certificates of compliance from the producer and treater will usually not have any identifying hammer mark on the end.

Materials accepted on the basis of certificate of tests from a commercial testing laboratory will have a hammer mark on the end of each piece.

Wood materials may be used upon delivery to the project provided they have not been damaged and the proper identifying hammer mark is on the end of each piece and the report covering the inspection is on hand or the project manager has received approved certificates of compliance for entry into AWP and OnBase.

Note 26
Rock Riprap, Gabion Stone Fill, and Revet Mattress Stone Fill

Acceptance will be at the source, field inspection will normally be limited to observation for size, cleanliness and segregation problems. A delivery ticket for each load of rock riprap or gabion stone fill delivered to the project or work site should include the name of the producer, the date, the location of the quarry, the quantity delivered (in tons), the name of the contractor and the project number. The delivery ticket should be given to the department representative at the time of arrival.

If the aggregate is from a source that has not pre-approved, contact the Materials & Research Division's Aggregate laboratory for sample criteria.

Note 27
High Friction Surface Treatment

These materials are accepted on the basis of Manufacturer Certified Tests and Certificates of Compliance.

Aggregate:

- The Certificate of Compliance must cite the Aluminum Oxide (Al_2O_3) content for calcined bauxite.

Polymer Binder Resin:

- The Manufacturer Certified Tests will require independent laboratory tests meeting the physical requirements of the polymer binder resin system found in the special provisions.
- The Certificate of Compliance must include product, lot number, and expiration date.
- The material properties shall meet the physical requirements of the polymer binder resin system found in the special provisions.
- The Certificate of Compliance must be signed by a company representative.

Note 28
Random Sampling Generator

The random sample generator shall be used to determine the sample or test location for selected items.

The random sample generator can be found here:

- Random Sample Generator (NDOT Reporting Portal)
- Random Sample Generator (NDOT Public Reporting Portal)

Note 29
Permanent Pavement Marking – Paint and Beads

This material is pretested by the Materials & Research Division Central Laboratory with samples sourced from contractor stock. A representative of NDOT must be present to indicate the specific container(s) for sampling and take custody of the samples for delivery to the central laboratory.

Upon completion of satisfactory testing, traffic paint is approved for one year from the date of manufacture; glass beads are approved for five years from the date of manufacture. Approved batch/lot numbers can be found on the Department of Transportation Materials & Research Division website.

ASTM D8008, Section 6.3. defines how paint samples will be sourced from the truck.

ASTM D8008, Section 6.2.5.3 defines how paint samples will be sourced from a tote.

AASHTO T346 allows for beads sampled from bulk containers. If beads are in 50-lb bags, one full bag shall be submitted to the central laboratory. A video demonstration is available at https://vimeo.com/showcase/10165/video/418893025

Note 30
Buy America Certification

The required Buy America (BA) certification must indicate the materials used to fabricate the contract material or product complies with federal requirements and was produced domestically. Domestic means within the United States, the District of Colombia, or in the territories and possessions of the United States. The certification must include:

- Identifying information such as contract ID, control number, project number and project name
    - Identifying information is not required for materials submitted for pre-approval (products noted on the NDOT approved products list, lots, batches, bundles, etc.)
- Identifying item information which contains clear and unique product identification (name of product with lot number, heat number, reel number, etc.)
- A domestic manufacture statement
- The typed name and signature of the manufacturer's authorized representative and the representative's title.

NEBRASKA DEPARTMENT OF TRANS-PORTATION

QUALITY ASSURANCE PROGRAM

FOR

CONSTRUCTION

MATERIALS

Materials Sampling Guide, Section 28

November 1, 2026

NEBRASKA DEPARTMENT OF TRANSPORTATION
QUALITY ASSURANCE PROGRAM FOR CONSTRUCTION

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1. INTRODUCTION

1.1 This manual describes a “Quality Assurance Program for Construction” established by the Nebraska Department of Transportation (NDOT). The intent of this program is to provide adequate assurance that the materials and workmanship incorporated in transportation projects as specified in paragraph 1.5 of this section, are in reasonable conformity with the requirements of the plans and specifications including any approved changes.

1.2 The first level of assurance is provided by qualified laboratories and testing personnel. This assures that equipment and personnel are capable of performing the tests properly. An independent assurance program provides the second level of assurance. This level assures that testing personnel and equipment remain capable of performing the tests properly. The third level of assurance is provided by verification sampling and testing. This level assures the quality of the product.

1.3 This program has been developed in conformance with the criteria contained in 23 CFR 637 (B). It consists of an acceptance program and independent assurance program. The acceptance program provides sampling and test results, obtained by qualified testing personnel and laboratories, used in the acceptance decision. The independent assurance program provides for checking the testing personnel and test equipment.

1.4 This quality assurance program allows for the use of validated contractor-performed quality control (QC) test results for the acceptance decision. It also allows for the use of test results obtained by commercial laboratories in the independent assurance program, as well as in acceptance decisions. Contractor and commercial laboratories and their personnel performing quality control sampling and testing used in the acceptance decision must be evaluated by the independent assurance program.

1.5 *Applicability* – This "Quality Assurance Program for Construction" is required for all highways on the National and State Highway Systems let through the NDOT Construction Division’s electronic bidding system. It does not apply to roadside appurtenances to the National and State Highway Systems such as rest areas and weigh stations, except for any driving surfaces or parking areas associated with a roadside appurtenance. The program is also required for all local projects let through the NDOT electronic bidding system. If the project is not let through NDOT, a local jurisdiction may, at their discretion, specify the requirements contained herein for any or all construction projects under their authority.

2. DEFINITIONS

2.1 ***Acceptance Program*** – All factors that comprise NDOT's determination of the quality of the product as specified in the contract requirements. These factors include verification sampling, testing, and inspection, as well as results of quality control sampling and testing.

2.2 ***Engineer*** – A representative duly authorized by the Director, such representative acting within the scope of the particular duties assigned to him/her or the authority given to him/her.

2.3 ***Independent Assurance Program*** – Activities that are an unbiased and independent evaluation of all sampling and testing procedures used in the acceptance program. Test procedures used in the acceptance program which are performed in the Materials & Research Central Laboratory are not covered by the independent assurance program since the central laboratory maintains accreditation through the AASHTO Accreditation Program.

2.4 ***Proficiency Samples*** – Homogeneous samples that are distributed and tested by two or more laboratories. The test results are compared to assure that the laboratories are obtaining the same results.

2.5 ***Qualified Laboratories*** – Laboratories that are capable of performing test procedures as established by the NDOT Laboratory/Equipment Qualification Program (Appendix B). This program includes, as a minimum, provisions for checking test equipment and a requirement that the laboratory maintain records of all calibration checks.

2.6 ***Qualified Sampling and Testing Personnel*** – Personnel who are capable of sampling and testing construction materials as established by the NDOT Sampling and Testing Personnel Qualification Program (Appendix A). This program includes, as a minimum, requirements that personnel demonstrate their ability to perform sampling and testing procedures, as well as, pass a written examination.

2.7 ***Quality Assurance*** – All those planned and systematic actions necessary to provide confidence that a product or service will satisfy given requirements for quality.

2.8 ***Quality Control*** – All contractor/vendor operational techniques and activities that are performed or conducted to fulfill the contract requirements.

2.9 ***Random Sample*** – A sample drawn from a lot in which each increment in the lot has an equal probability of being chosen.

2.10 ***Vendor*** – A supplier of project-produced material that is not the contractor, such as an aggregate producer or ready-mix concrete supplier.

2.11 ***Verification Sampling and Testing*** – Sampling and testing performed to validate the quality of a product.

3. ACCEPTANCE PROGRAM

3.1 ***General*** – Materials incorporated into any highway construction project shall be subject to verification sampling and testing, as well as, QC sampling and testing when required by the specifications.

Material acceptance is defined by these categories:

- Visual Verification
- **Note*** This acceptance method will not be paired with other acceptance methods. Once recorded, no additional documentation is required.

- Approved Products List
- Certificate of Compliance
- Certificate of Tests
- Sample and Test
- **Note*** These acceptance methods may be paired with one or more other acceptance methods and require further action or record compliance.

- Nebraska Qualified Material Vendors List
- **Note*** This acceptance method must be paired with another acceptance method.

3.2 ***Verification Sampling and Testing (Frequency, Location and Attributes)*** – Frequency of the verification sampling and testing will depend on whether or not the contractor's QC testing (See Section 3.3) is a part of the acceptance decision. Verification sampling and testing shall be performed at the location and frequency, and for the attributes (gradation, density, air content, etc.) established in the NDOT Materials Sampling Guide. Verification sampling and testing personnel, laboratories, and equipment shall be qualified in accordance with the NDOT Sampling and Testing Personnel Qualification Program (Appendix A) and the NDOT Laboratory/Equipment Qualification Program (Appendix B) and shall be evaluated under the independent assurance program shown in Section 4 of this document. Qualified NDOT personnel or their designated agents shall perform verification sampling and testing. Copy of the verification test results will be sent to the contractor, NDOT project manager, and the Materials & Research Central Laboratory.

3.2.1 *Project Produced Materials* – These materials can generally be described as those that are produced to meet the requirements of a specific project. They are characterized by being sampled at the construction project site and tested either at the project site or at a qualified laboratory. Aggregates, asphaltic concrete, and Portland cement concrete are considered project produced materials. The NDOT Materials Sampling Guide identifies the location and frequency for sampling and testing the various attributes (gradation, density, air content, etc.) of project produced materials.

3.2.2 *Manufactured Materials* – These materials can generally be described as those that are manufactured to meet the requirements of a specific AASHTO, ASTM, or other standard. They can be used on numerous construction projects, provided they meet specification requirements for those projects. These materials may require sampling at the project site with the sample forwarded to the Materials & Research Central Laboratory for testing. These materials may also require manufacturer certifications and/or manufacturer certified test reports. Some manufactured materials may be pretested through arrangements with the Materials & Research Central Laboratory. Pretested materials are identified by approved

lot numbers or identification tags indicating an NDOT approved material. Pre-tested materials that have been primarily tested or approved by the Materials & Research Central Laboratory may be used without further sampling and testing.

Certificate of Compliance – The Certificate of Compliance shall state that the material or item meets all requirements defined for the project. Each COC will include all pertinent data (i.e. contract material description, size, quantity, specification number, codes, contractor performing work, project number, project location, etc.) for the materials represented by the certificate. The COC shall be signed by the manufacturer's authorized representative and indicate the representative's job title.

Certificate of Tests – Manufacturer's Certificate of Tests shall show the required test results and certify they are correct. In some instances, such as steel for reinforcement, the process of manufacture must also be shown. The COT shall be signed by the manufacturer's authorized representative and indicate the representative's job title.

The cost of providing the COC the COT and all expenses incurred regarding testing and sampling will not be paid for directly. This will be considered subsidiary to items for which the contract provides direct payment.

3.2.3 *Approved Products List* – Materials identified in the NDOT Approved Products List may be used on a project by notifying the engineer of the specific brand name. The NDOT Materials & Research Central Laboratory approves these materials for use on projects. Materials on the NDOT Approved Products List do not require sampling and testing on the project site, unless requested by the engineer. They may require a certificate of compliance or certified test report when the need for such a document is specifically identified in the NDOT Approved Products List or the project specifications.

3.2.4 Nebraska Qualified Material Vendors List – NDOT will pre-qualify material vendors to supply specific materials based on specification as outlined in the Standard Specification for Highway Construction and contract. In addition to these qualifications, additional material acceptance documentation is required for the materials provided by these vendors.

The NQMVL is maintained by the Materials & Research Division. The NQMVL is subject to change at the discretion of the Nebraska Department of Transportation.

3.3 ***Quality Control Sampling and Testing*** – Contractor performed quality control (QC) sampling and testing may be used as a part of the acceptance decision when required or allowed by the project specifications. Quality control sampling and testing personnel, laboratories, and equipment shall be qualified in accordance with the NDOT Sampling and Testing Personnel Qualification Program (Appendix A) and the NDOT Laboratory/Equipment Qualification Program (Appendix B) and shall be evaluated under the independent assurance program shown in Section 4 of this document. Quality control test results shall be validated by verification test results (See Section 3.2) obtained from independently taken samples. Qualified NDOT personnel or their designated agents shall perform verification sampling and testing.

3.3.1 *Quality Control Program* – When required by the specifications a quality control program must be developed by the contractor and submitted as required by the contract for approval. The minimum requirements of a quality control program are shown in Appendix C. Specifications may require that additional information be provided in the quality control program.

3.3.2 *Dispute Resolution System* – When quality control test results are used in the acceptance decision, discrepancies arising between the verification sampling and testing performed by NDOT, or its designated agents, and quality control sampling and testing performed by the contractor, shall be resolved in a reliable, unbiased manner, by referee testing or evaluation performed by the Materials & Research Central Laboratory. On every sample, NDOT will retain enough material to conduct a dispute resolution on the original sample material. If NDOT doesn't have enough original material to sample, NDOT reserves the right to test from in-place material or other means of investigation. The decision by the Materials & Research Central Laboratory will be final. The Materials & Research Central Laboratory may obtain the services of an independent commercial laboratory accredited in the testing to be performed, by the AASHTO Accreditation Program or a comparable laboratory accreditation program approved by FHWA, to aid in resolving any dispute. The decision to utilize the services of an independent commercial laboratory rests solely with the Materials & Research Central Laboratory.

4. INDEPENDENT ASSURANCE PROGRAM

4.1 ***General*** – All sampling and testing procedures, personnel and equipment used as part of the acceptance decision shall be evaluated by the independent assurance (IA) program. Any non-NDOT laboratory which performs independent assurance sampling and testing shall be accredited in the testing to be performed, by the AASHTO Accreditation Program or a comparable laboratory accreditation program approved by FHWA. The independent assurance program includes both system and project-based approaches. The system approach shall be used unless the specifications for a project specifically require a project-based approach for independent assurance sampling and testing.

4.1.1 *System Approach* – The system approach bases frequency of independent assurance activities on time, regardless of the number of tests, quantities of materials, or number of projects being tested by an individual being evaluated.

4.1.2 *Project-Based Approach* – The project-based approach bases frequency of independent assurance activities primarily on quantities of materials being tested and requires minimum independent assurance activities on the project.

4.2 ***Sampling and Testing Frequency and Location*** – Independent assurance sampling and testing shall be performed at the location and frequency, and for the attributes (gradation, density, air content, etc.) established in the NDOT Materials Sampling Guide. Sampling and testing procedures performed by the Materials & Research Central Laboratory are not subject to the independent assurance program since the laboratory maintains accreditation through the AASHTO Accreditation Program.

4.3 ***Testing Equipment*** – Branch laboratory equipment used for independent assurance sampling and testing shall be qualified by the Materials & Research Central Laboratory in accordance with the NDOT Laboratory/Equipment Qualification Program (Appendix B). The central laboratory shall qualify any AASHTO accredited commercial laboratory equipment used for independent assurance sampling and testing by verifying that the equipment has been calibrated/verified and that supporting calibration/verification data is on file. The frequency for qualifying independent assurance sampling and testing equipment shall not exceed one year. Qualification shall be scheduled on a more frequent basis if the operation of the equipment is suspect. The independent assurance equipment shall be other than that used for quality control sampling and testing. Any equipment used to perform verification and/or quality control sampling and testing for an acceptance decision shall be evaluated by independent assurance sampling and testing personnel. This evaluation shall include calibration checks and split or proficiency sample tests. The requirements for, and frequency of, verification and/or quality control equipment calibration are shown in Appendix B. Acceptable tolerance limits for the comparison of test results for split or proficiency samples are shown in Appendix D.

4.4 ***Testing Personnel*** – Branch laboratory personnel who perform independent assurance sampling and testing shall be qualified by the Materials & Research Central La-

boratory in accordance with the NDOT Sampling and Testing Personnel Qualification Program (Appendix A). The central laboratory shall qualify any AASHTO accredited commercial laboratory personnel performing independent assurance sampling and testing by verifying that the laboratory is accredited in the applicable test procedures and that the personnel meet the AASHTO Accreditation Program requirements. When contractor's QC testing is part of the acceptance program, Individuals performing independent assurance sampling and testing may also perform the verification sampling and testing. When contractor's QC testing is not part of the acceptance program, Individuals performing independent assurance sampling and testing shall be other than those who perform verification sampling and testing. Any individual who performs verification or quality control sampling and testing shall be evaluated by independent assurance sampling and testing personnel at least once a year. This evaluation shall include observation and split or proficiency sampling and testing. Acceptable tolerance limits for the comparison of test results from split or proficiency samples are shown in Appendix D. An IA will not be required of any individual for the year they receive certification or recertification for AASHTO and ASTM test methods.

4.5 *Comparison of Test Results* – A prompt comparison of test results obtained by the individual being evaluated and the independent assurance tester shall be performed by a quality assurance manager, a qualified evaluator designated by the quality assurance manager, or AASHTO accredited commercial laboratory personnel. Acceptable tolerance limits for the comparison of test results from split or proficiency samples are shown in Appendix D. If the comparison of test results do not comply with the tolerances, a review of the test procedure and testing equipment shall be performed immediately to determine the source of the discrepancy. Corrective action must be identified and incorporated as appropriate, followed by additional independent assurance testing. Test results from all samples involved in the independent assurance program shall be documented with reports maintained in branch laboratory files. Copies of these reports shall be transmitted to the appropriate district. When a project-based approach is used for the independent assurance program, copies of the reports shall also be maintained in the project files. If an AASHTO accredited commercial laboratory performs independent assurance testing, all test results and reports shall be forwarded to the central laboratory for distribution to the appropriate branch laboratory and district.

4.6 Annual Report of Independent Assurance Program Results – An annual report, conforming in substance to that shown in Appendix F, shall be submitted to the FHWA Division Administrator summarizing the results of the NDOT system approach independent assurance program.

5. MATERIALS CERTIFICATION

5.1 A materials certification, conforming in substance to that shown in Appendix E shall be submitted to the FHWA Division Administrator for each construction project which:

5.1.1 Utilizes federal funding and is over $1,000,000 or

5.1.2 Subject to full federal oversight.

6. CONFLICT OF INTEREST

6.1 To avoid the appearance of a conflict of interest, any qualified non-NDOT laboratory shall perform only one of the following types of testing on the same project: verification testing, quality control testing, independent assurance testing, or dispute resolution testing.

7. QUALIFICATION OF LABORATORIES AND SAMPLING AND TESTING PERSONNEL

7.1 *Laboratories*:

7.1.1 The NDOT Materials & Research Central Laboratory shall be accredited and maintain accreditation through the AASHTO Accreditation Program.

7.1.2 After June 29, 2000, all contractor, vendor and NDOT testing used in the acceptance decision shall be performed by qualified laboratories and/or equipment in accordance with the NDOT Laboratory/ Equipment Qualification Program (Appendix B).

7.1.3 After June 29, 2000, any non-NDOT laboratory designated to perform independent assurance sampling and testing shall be accredited in the testing to be performed by the AASHTO Accreditation Program.

7.1.4 After June 29, 2000, any non-NDOT laboratory that is used in dispute resolution sampling and testing shall be accredited in the testing to be performed by the AASHTO Accreditation Program.

7.2 *Sampling and Testing Personnel* After June 29, 2000, all sampling and testing data to be used in the acceptance decision or the independent assurance program shall be performed by qualified sampling and testing personnel in accordance with the NDOT Sampling and Testing Personnel Qualification Program (Appendix A).

APPENDIX A

SAMPLING AND TESTING PERSONNEL QUALIFICATION PROGRAM

A1. *Purpose* – This program provides uniform statewide procedures for sampling and testing personnel qualifications to ensure that tests required by the specifications are performed in accordance with prescribed sampling and testing methods.

A2. *Qualification of Sampling and Testing Personnel*:

A2.1 Any individual who samples and/or performs required tests on materials for acceptance or verification must be qualified.

A2.2 Sampling and testing personnel will be qualified to perform tests for the acceptance or verification of materials in the areas of aggregates, soils, bituminous materials and Portland cement concrete. The test methods for which individuals will be qualified shall include, but are not limited to, those shown in Table A1. There may be other test procedures used in specific geographical locations of the state or used on unique construction projects in which sampling and testing personnel need to be qualified.

A3. *Responsibility for Qualifying Sampling and Testing Personnel*:

A3.1 The following personnel may qualify an individual to perform required tests on materials by observing each test and administering the required examinations:

A3.1.1 Materials & Research Central Laboratory personnel.

A3.1.2 Quality assurance managers; responsible for branch laboratory personnel and operations and responsible for independent assurance sampling.

A3.1.3 Qualified branch laboratory personnel who have been authorized by a quality assurance manager.

A3.1.4 Other NDOT personnel who have been qualified to perform specific tests may be authorized by the Materials & Research Central Laboratory to qualify others.

A 3.1.5 Independent sources, such as the American Concrete Institute (ACI) or qualified consultants, with the approval of the Materials & Research Central Laboratory.

A3.2 Each branch laboratory shall maintain a minimum of one individual qualified by the Materials & Research Central Laboratory for each test procedure performed within the branch laboratory's area of responsibility.

A4. *Qualification Procedure*:

A4.1 Except as noted in paragraph A4.2.1, to qualify, an individual must successfully perform the specific test or series of tests related to a specific level of qualification as identified in Table A1. The test performance, and any calculations required to determine specification compliance, must be done in the presence of an authorized evaluator as identified in Section A3.1. Successful performance is defined as demonstrating the ability to properly perform key elements for each test method. Anyone failing to demonstrate the ability to perform a test will, at the evaluator's convenience, be allowed a maximum of two re-tests per test method in a calendar year.

A4.2 After successful performance of a test method, the individual must also pass a written examination administered by an authorized evaluator with a minimum score of 70 percent. An individual failing the written examination may request a retest. The individual will be allowed an unlimited number of retests in a calendar year; however, the scheduling of retests for the written examination is at the evaluator's convenience.

A4.2.1 Newly hired and temporary project inspection staff may obtain provisional certification issued by NDOT quality assurance manager or designee, to be qualified to conduct limited sample and testing as asphalt, PCC, or soils/aggregate field technician certification. The provisional certification will permit the inspecting personnel to perform the material testing while within direct communication access of a certified field or qualified laboratory technician. Project inspection staff will be able to perform testing under the provisional certification for a maximum of one construction season, however, the person must attend the first available certification training session.

A4.3 Any individual who performs verification or quality control sampling and testing that fails to be qualified in that calendar year, or if the qualification is revoked, the individual must obtain additional training and again complete the testing requirements identified in Sections A4.1 and A4.2.

A4.4 A standard set of examinations will be used statewide. The examination will be developed by a committee of personnel from the Materials & Research Central laboratory, branch laboratories, and may include industry representatives for test procedures used in contractor performed quality control testing.

A4.5 As a part of the qualification process the individual must participate in proficiency or split sample testing through the independent assurance program. The results of the proficiency or split sample testing will be evaluated within the acceptable tolerance limits identified in Appendix D. If the comparison of test results does not comply with the tolerances, a review of the test procedure and equipment shall be performed immediately to determine the source of the discrepancy. Corrective action must be identified and incorporated as appropriate, prior to the individual performing additional testing on that test method.

A4.6 Qualification of an individual is valid for not more than five years, after which the individual must be re-qualified.

A4.7 Individuals certified through an independent source approved by the Materials & Research Central Laboratory are exempt from the qualification procedure outlined above.

A4.8 Individuals performing contractor quality control testing who have been qualified or certified by another state transportation department may be exempt from all or portions of the qualification procedure outlined above. The Materials & Research Central Laboratory will make decisions regarding the granting of a total or partial exemption. To apply for an exemption, the contractor must submit to the Materials & Research Central Laboratory, the names of the individuals seeking exemption, a listing of test procedures for which the individual has been qualified or certified by another state transportation department and the individual's name, address and telephone number from the state transportation department having responsibility for that state's qualification/certification program.

A5. *Documentation*:

A5.1 The Materials & Research Central Laboratory will be responsible for maintaining electronic documentation in AWP of all individuals qualified to perform required tests for the acceptance of materials. The requirement for maintaining documentation is applicable to NDOT, LPA, and consultant personnel performing acceptance and verification testing, and contractor personnel performing

quality control testing. The entity coordinating the certification training will retain copies of the written examinations through the life of the qualification as well as maintaining necessary testing and certification protocol requirements and manuals.

A6. *Disqualification*:

A6.1 Notice of abuse or neglect for any procedures or responsibilities identified in this quality assurance program shall be made to the qualification advisory committee, chaired by the Materials & Research Engineer. The advisory committee will notify the person being investigated of the allegation and that the charges are being reviewed. The difference between neglect and abuse is intent and shall be determined by the qualification advisory committee. Penalties shall be imposed upon the recommendation of the qualification advisory committee. Penalties shall range from a minimum of 10-day suspension to a maximum of permanent revocation of the qualification certificate.

A6.2 *Neglect* – The first instance of neglect shall result in a 10-day suspension of the qualification certificate. The second instance of neglect shall result in a 30-day suspension of the qualification certificate. A third instance of neglect shall be considered as and treated the same as abuse. Example of Neglect – failing to post or properly record a test result.

A6.3 *Abuse* – The first instance of abuse shall result in a 90-day suspension of the qualification certificate. The second instance of abuse shall result in permanent revocation of the qualification. Permanent revocation of a qualification shall result in that individual being ineligible for qualification at any level. Example of Abuse – falsification of test results.

A6.4 *Qualification Advisory Committee* – In addition to the Materials & Research Engineer as chair of the committee, two other NDOT members and two industry members shall be appointed to the committee by the Materials & Research Engineer. The Nebraska Chapter of the Associated General Contractors shall be consulted concerning the selection of the two industry members. The appointed members shall have no direct involvement with the case. The qualification advisory committee may, at their discretion, conduct a hearing involving the individual accused of neglect or abuse and other interested parties.

A6.5 The policies and procedures described above are applicable to NDOT personnel, or designated agent, involved in the acceptance and verification of materials as well as contractor personnel or vendor involved in quality control testing.

A6.6 The reference made above to "suspension" applies only to suspension of the qualification certificate and is not intended to imply that an individual will be suspended from work. While suspension from work or termination of employment may be a consideration depending on the level of neglect or abuse exhibited, such action would be taken through normal NDOT or contractor procedures for disciplinary action.

TEST METHODS FOR QUALIFICATION OF SAMPLING AND TESTING PERSONNEL

SAMPLING AND TESTING PERSONNEL QUALIFICATION PROGRAM				
Laboratory and Field Technician Certifications				
	Concrete	**Soils**	**Asphalt**	**Pavement Marking**
[1]Laboratory	[3]ACI Concrete Strength Testing Technician (5 year)	[3]Earthwork Technician II (5 year)	[3]Asphaltic Concrete Technician (5 year)	
	Maturity Curve Method of Development (5 year)			
Field	[3]ACI Concrete Field Testing Technician (5 year)	[3]Earthwork Technician I (5 year)	PG Binder/Emulsion Sample Technician (5 year)	Paint & Bead Sampling (5 year)
	Concrete Plant Technician Contractors and Consultants (5 year)		[2]Asphaltic Field Technician I (5 year)	
	Portland Cement Concrete Paving Inspection (Lifetime)		[2]Asphaltic Field Technician II (5 year)	
	Maturity Method Field Monitoring (5 year)			
	[3]Profilograph Operator (5 year)			
	Portland Cement Sampler (Lifetime)			
Note 1	The laboratory where the testing is conducted must appear on the Nebraska Qualified Consultant Laboratory list maintained on the Materials & Research website: Qualified Consultant Laboratories			
Note 2	These inspector qualifications are required for NDOT employees in 2011 and highly recommended for anyone inspecting a state or federal aid project in Nebraska. Effective 2012, these qualifications will be required for all technicians hired for this type of inspection.			
Note 3	Qualified technicians hired for sampling and testing on federally funded projects or LPA projects on the NHS system must have an independent assurance Review (IA) on an annual basis one year after obtaining initial qualification.			

TABLE A1 – TEST METHODS FOR QUALIFICATION OF SAMPLING AND TESTING PERSONNEL

CONCRETE	
Concrete Laboratory Technicians	
Certification	**ACI Concrete Strength Testing Technician** A Concrete Strength Testing Technician is an individual who has demonstrated the knowledge and ability to properly perform, record and report the results of four basic ASTM laboratory procedures related to the determination of concrete compressive and flexural strength. *This certification is required of all personnel performing project material acceptance testing and/or sampling of concrete.* **Course Title:** Concrete Strength Testing Technician **Training Coordinated By:** Nebraska Concrete and Aggregate Association **Certification Duration:** 5 Year **Certification Records Retained:** AWP and ACI Website **Authority:** ACI **Prerequisite:** NA
Technicians are Certified Proficient in	
ASTM C 617	Capping Cylindrical Concrete Specimens
ASTM C 1231	Use of Unbonded Caps in Determination of Compressive Strength of Hardened Concrete Cylinders
ASTM C 39	Compressive Strength of Cylindrical Specimens
ASTM C 78	Flexural Strength of Concrete
Certification	**Maturity Curve Method of Development** An individual who has demonstrated the knowledge and ability to develop a maturity curve Time-Temperature-Factor (TTF) for concrete applications. **Course Title:** Maturity Curve Method of Development **Training Coordinated By:** **LTAP:** Consultants **NDOT:** Employee Development Center (EDC) **Certification Duration:** 5 Year **Certification Records Retained:** AWP **Authority:** NDOT Materials & Research **Prerequisite:** ACI Concrete Field Test Technician & ACI Concrete Strength Testing Technician
Technicians are Certified Proficient in	
NDT C 1074	Estimating Concrete Strength by the Maturity Method

TABLE A1 – TEST METHODS FOR QUALIFICATION OF SAMPLING AND TESTING PERSONNEL, Continued

CONCRETE, continued	
Concrete Field Technicians	
Certification	**ACI Concrete Field Testing Technician** An ACI Concrete Field Testing Technician is an individual who has demonstrated the knowledge and ability to properly perform and record the results of seven basic field tests on freshly mixed concrete. *This certification is required of all personnel performing project material acceptance testing and/or sampling of concrete.* **Course Title**: Concrete Field Testing Technician – Grade I **Training Coordinated By**: Nebraska Concrete and Aggregate Association **Certification Duration**: 5 Year **Certification Records Retained**: AWP and ACI Website **Authority**: ACI **Prerequisite**: Concrete Field Inspector/General Handling of Concrete
Technicians are Certified Proficient in	
ASTM C 31	Making and Curing Concrete Test Specimens in the Field
ASTM C 138	Unit Weight, Yield and Air Content (Gravimetric) of Concrete
ASTM C 143	Slump of Hydraulic Cement Concrete
ASTM C 172	Sampling of Freshly Mixed Concrete
ASTM C 173	Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C 231	Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 1064	Temperature of Freshly Mixed Concrete
Certification	**Concrete Plant Technician** This course has been prepared to cover the fundamentals of concrete, hydration, critical properties, tempering, hot & cold weather, batching & mixing, designing, proportioning of concrete, and aggregate sampling and testing. Individuals who oversee proportioning of concrete, running moistures on aggregates, performing gradations etc., are required to obtain Concrete Plant Technician certification and must be qualified in the test methods identified for the tests listed below. **Course Title:** Concrete Plant Technician **Training Coordinated By:** Nebraska Concrete and Aggregate Association **Certification Duration:** Contractors and Consultants, – 5 Years **Certification Records Retained:** AWP **Authority:** NDOT Materials & Research **Prerequisite**: NA
Technicians are Certified Proficient in	
AASHTO T 2	Sampling Aggregates
AASHTO T 11	Materials Finer Than 75 Microns (No 220 Sieve) in Mineral Aggregates by Washing
AASHTO T 27	Sieve Analysis of Fine and Coarse Aggregates
AASHTO T 248	Reducing Field Samples of Aggregate to Testing Size
AASHTO T 255	Total Moisture Content of Aggregate by Drying
NDT T 506	Determination of the Free Moisture Content of Aggregates
NDT S01	Method of Sampling Portland and Interground/Blended Cements

TABLE A1 – TEST METHODS FOR QUALIFICATION OF SAMPLING AND TESTING PERSONNEL, Continued

CONCRETE, continued	
Concrete Field Technicians, continued	
Certification	**Portland Cement Concrete Paving Inspection** Portland Cement Paving Inspection course is web-based and has been prepared by AASHTO Technical Training Solutions. to cover Portland Cement concrete paving materials and properties, project plans, safety, equipment, paving process, role of the inspector, paving activities, and urban paving. *This certification is required of all personnel inspecting the placement of concrete on a project. Certification will be completed online.* **Course Title:** PCC Paving Inspection **Training Coordinated By:** AASHTO Technical Training Solutions: Consultants **NDOT:** Employee Development Center (EDC) **Certification Duration:** Lifetime **Certification Records Retained:** AWP **Authority:** NDOT Materials & Research **Prerequisite:** NA
Technicians are Certified Proficient in	
Certification	**Maturity Method Field Monitoring** A Maturity Curve Monitoring Technician is an individual who has the knowledge and ability to properly perform the installation of the wires and monitor the concrete temperature. They shall demonstrate their ability to calculate the TTF and record the results in AWP. *This certification is required of all personnel who are monitoring the maturity meter for acceptance testing.* **Course Title:** Maturity Method Field Monitoring **Training Coordinated By:** **LTAP:** Consultants **NDOT:** Employee Development Center (EDC) **Certification Duration:** 5 Year **Certification Records Retained:** AWP **Authority:** NDOT Materials & Research **Prerequisite**: NA
Technicians are Certified Proficient in	
NDT C 1074	Estimating Concrete Strength by the Maturity Method

TABLE A1 – TEST METHODS FOR QUALIFICATION OF SAMPLING AND TESTING PERSONNEL, Continued

CONCRETE, continued	
Concrete Field Technicians, continued	
Certification	**Profilograph Operator** The operator of the profilograph is an individual who can demonstrate the use and setup of the equipment, show knowledge of the data analysis and guidance system. *This certification is required of all operators of the non-contact profiler.* **Course Title:** Profilograph Operator **Training Coordinated By:** NDOT Materials & Research **Certification Duration:** 5 Year **Certification Records Retained:** AWP **Authority:** NDOT Materials & Research **Prerequisite**: NA
Technicians are Certified Proficient in	
Certification	**Portland Cement Sampler** To become certified as a Portland Cement Sampler, the individual will be able to review, NDT S01, understand and/or perform actual demonstration of the sampling procedure. **Training Coordinated By:** NDOT Materials & Research or Designee **Certification Duration:** Lifetime **Certification Records Retained:** AWP **Authority:** NDOT Materials & Research or Designee **Prerequisite:** NA
Technicians are Certified Proficient in	
NDT S01	Method of Sampling Portland and Interground/Blended Cements

TABLE A1 – TEST METHODS FOR QUALIFICATION OF SAMPLING AND TESTING PERSONNEL, Continued

SOILS	
Soils Laboratory Technicians	
Certification	**Earthwork Technician II** This certification class is intended for laboratory technicians to become proficient to perform laboratory tests on soils. This includes step by step tests procedures and laboratory work. A trainee must demonstrate proficiency in laboratory testing to be qualified as an Earthwork Technician II. *This certification is required of all personnel performing project material acceptance testing and/or sampling in the soil lab.* **Course Title**: Earthwork Technician II **Training Coordinated By:** LTAP **Certification Duration:** 5 Year **Certification Records Retained:** AWP **Authority:** NDOT Materials & Research **Prerequisite**: Earthwork Technician I
Technicians are Certified Proficient in	
AASHTO R 58	Dry Preparation of Disturbed Soil and Soil Aggregate Samples for Test
AASHTO T 89	Determining the Liquid Limit of Soils
AASHTO T 90	Determining the Plastic Limit and Plasticity Index of Soils
AASHTO T 99	Moisture-Density Relations of Soils Using a 2.5-kg (5.5-lb) Rammer and a 305-mm (12 in.) Drop
AASHTO T 248	Reducing Samples of Aggregate to Testing Size
AASHTO T 265	Laboratory Determination of Moisture Content of Soils
Soils Field Technicians	
Certification	**Earthwork Technician I** This is a one day certification class intended to provide basic guidance to construction and materials personnel involved in field testing and inspection of earthwork construction. *This certification is required of all personnel performing project material acceptance testing and/or sampling in the field.* **Course Title**: Earthwork Technician I **Training Coordinated By:** LTAP **Certification Duration:** 5 Year **Certification Records Retained:** AWP **Authority:** NDOT Materials & Research **Prerequisite:** NA
Technicians are Certified Proficient in	
ASTM D 2167	Density of Soil In-Place by the Rubber Balloon Method
AASHTO T 2	Sampling of Aggregates
AASHTO T 11	Materials finer than 75 Microns (No. 200 Sieve) in Mineral Aggregates by Washing
AASGTO T 27	Sieve Analysis of Fine and Coarse Aggregates
AASHTO T 248	Reducing Field Samples of Aggregate to Testing Size
AASHTO T 255	Total Moisture Content of Aggregate by Drying
AASHTO T 310	Density of Soil and Soil-Aggregate In-Place by Nuclear Methods (Shallow Depth)
AASHTO T 265	Laboratory Determination of Moisture Content of Soils
NDT T 2835	Deflection Measurement of Soils Using a Lightweight Deflectometer (LWD)

TABLE A1 – TEST METHODS FOR QUALIFICATION OF SAMPLING AND TESTING PERSONNEL, Continued

ASPHALT	
Asphaltic Laboratory Technicians	
Certification	**Asphaltic Concrete Technician** This three day certification class is required for all laboratory technicians that do work in the State of Nebraska. It consists of lectures, a full asphalt laboratory demonstration, and hands-on laboratory work, helping attendees better understand NDOT and AASHTO specifications and procedures. Participants will become familiar with and run the following aggregate and volumetric mix design tests: Flat and Elongated, Sand Equivalent. The objective of the class is that the attendees would be proficient in running the standardized test procedures, equipment, and subsequent calculations to be able to provide accurate reporting of test results for a Nebraska Qualified Superpave Asphalt Lab. *This certification is required of all personnel performing project material acceptance testing and/or sampling.* **Course Title**: Asphaltic Concrete Technician **Training Coordinated By:** NDOT Materials & Research **Certification Duration**: 5 Year **Certification Records Retained:** AWP **Authority:** NDOT Materials & Research
Technicians are Certified Proficient in	
AASHTO T 166	Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens
AASHTO T 168	Sampling Bituminous Paving Mixtures
AASHTO T 209	Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
AASHTO T 27	Sieve Analysis of Fine and Coarse Aggregate
AASHTO T 30	Mechanical Analysis of Extracted Aggregates
AASHTO T 84	Specific Gravity and Absorption of Fine Aggregate
AASHTO T 85	Specific Gravity and Absorption of Coarse Aggregate
AASHTO T 269	Volumetric Analysis of Compacted Hot Mix Asphalt (HMA)
AASHTO T 304	Un-compacted Void Content of Fine Aggregate
AASHTO T 248	Reducing Samples of Aggregate to Testing Size
ASTM D 5821	Determining the Percentage of Fractured Particles in Coarse Aggregate
AASHTO T 312	Preparing and Determining the Density of Hot Mix Asphalt (HMA) Specimens by Means of the SHRP Gyratory Compactor
AASHTO T 308	Asphalt Content of Hot Mix Asphalt (HMA) by the Ignition Method
AASHTO T 269	Percent Air Voids in Compacted Dense and Open Bituminous Mixtures
AASHTO T 2	Sampling Aggregate
NDT T 587	Density of Bituminous Concrete In-Place by Nuclear Method

TABLE A1 – TEST METHODS FOR QUALIFICATION OF SAMPLING AND TESTING PERSONNEL, Continued

ASPHALT, continued	
Asphaltic Field Technicians	
Certification	**PG Binder/Emulsion Sample Technician** To become certified as a PG Binder/Emulsion Sample Technician, the certified individual will be able to review, AASHTO T40 section 10 and the NDOT edits, demonstrate, understand, and perform actual demonstration of the sampling procedure. **Training Coordinated By:** NDOT Materials & Research **Certification Duration:** 5 year **Certification Records Retained:** AWP **Authority**: NDOT Materials & Research
Technicians are Certified Proficient in	
AASHTO T 40	Bituminous Materials Sampling
Certification	**Asphaltic Field Technician I** This one-day certification class is required for all asphalt inspectors that do work on NDOT let projects. The objective of the class is to help inspectors become familiar with the NDOT QA/QC sampling program and equip them with the resources needed to implement all sampling and inspection requirements. Topics include: Asphalt laboratory equipment and testing, sampling schedules, density coring, production sampling, custody of samples, verification testing, production tolerances, testing tolerances, and related NDOT asphalt specifications. Completion of Asphaltic Field Technician I also satisfies certification requirements for PG Binder/Emulsion Sample Technician. **Course Title**: Asphaltic Field Technician I **Training Coordinated By:** LTAP **Certification Duration:** 5 Year **Certification Records Retained:** AWP **Authority:** NDOT Materials &Research
Technicians are Certified Proficient in	
AASHTO T 40	Bituminous Materials Sampling
Certification	**Asphaltic Field Technician II** This one-day certification class is required for all asphalt inspectors that do work on NDOT let projects. A continuation of the Asphaltic Field Technician I Class, the Technician II training equips participants with the necessary knowledge for inspection of asphalt laydown, compaction, plant production and delivery, pay factors, and the related NDOT asphalt specifications. **Course Title:** Asphaltic Field Technician II **Training Coordinated By:** LTAP **Certification Duration:** 5 Year **Certification Records Retained:** AWP **Authority:** NDOT Materials & Research
Technicians are Certified Proficient in	

TABLE A1 – TEST METHODS FOR QUALIFICATION OF SAMPLING AND TESTING PERSONNEL, Continued

PAVEMENT MARKING	
Pavement Marking Field Technicians	
Certification	**Paint & Bead Sampling** This half-day certification course intended to provide basic guidance to construction and contractor personnel involved in field sampling of traffic paint and glass beads. **Coarse Title:** Traffic Paint & Glass Bead Field Sampling **Training Coordinated By:** NDOT Materials & Research **Certification Duration:** 5 Year **Certification Records Retained:** AWP **Authority:** NDOT Materials & Research **Prerequisite:** Permanent Pavement Marking Traffic Paint and Glass Beads Sampling Video
Technicians are Certified Proficient in	
ASTM D 8008	Standard Practice for Representative Field Sampling of Traffic Paints
AASHTO T 346	Standard Method of Test for Glass Beads Used in Pavement Markings – Sampling from Bulk Containers

TABLE A1 – TEST METHODS FOR QUALIFICATION OF SAMPLING AND TESTING PERSONNEL, Continued

SAMPLING AND TESTING PERSONNEL QUALIFICATION PROGRAM
Laboratory and Field Technician Certifications - Provisional
The following provisional certifications are applicable for NDOT project inspection staff and asphalt contractors performing acceptance testing. Refer to NDOT Sampling Guide Section 28, Appendix A for additional clarification. NDOT QA Managers (or the approved designee) are responsible to maintain provisional certifications in AWP.

CONCRETE	
Provisional Certification	
Certification	**Portland Cement Concrete Paving Inspection** **Training Coordinated By:** NDOT Materials & Research **Certification <u>Required</u> for:** Project inspection staff conducting sampling and testing without full certification. **Certification Duration**: 1 Year **Certification Records Retained:** AWP **Authority:** NDOT Materials & Research
Technicians are Certified Proficient in	
ASTM C 143	Slump of Hydraulic Cement Concrete
ASTM C 231	Air Content of Freshly Mixed Concrete
ASTM C 31	Making and Curing Concrete Test Specimens in the Field
ASTM C 172	Sampling of Freshly Mixed Concrete
ASTM C 1064	Temperature of Freshly Mixed Concrete
SOILS	
Provisional Certification	
Certification	**Soil/Aggregate Technician Provisional Certification** **Training Coordinated By:** NDOT Materials & Research **Certification <u>Required</u> for:** Project inspection staff conducting sampling and testing without full certification **Certification Duration:** 1 Year **Certification Records Retained:** AWP **Authority:** NDOT Materials & Research
Technicians are Certified Proficient in	
ASTM D 2167	Density of Soil – Balloon Test
ASTM D 2488	Description and Identification of Soils
AASHTO T 2	Sampling Aggregate
AASHTO T 27	Sieve Analysis of Fine and Coarse Aggregates
AASHTO T 248	Reducing Field Samples of aggregate to Testing Size
AASHTO T 255	Total Moisture Content of Aggregate by Drying
AASHTO T 310	Density of Soil and Soil-Aggregate In-Place by Nuclear Methods (Shallow Depth)
NDT T506	Determination of the Free Moisture Content of Aggregate
NDT T 2835	Deflection Measurement of Soils Using a Lightweight Deflectometer (LWD)
ASPHALT	
Provisional Certification	
Certification	**Asphaltic Concrete Technician Provisional Certification** **Training Coordinated By:** NDOT Materials & Research **Certification <u>Required</u> for:** Project inspection staff conducting sampling and testing without full certification **Certification Expiration:** 1 Year **Certification Records Retained:** AWP **Authority:** NDOT Materials & Research
Technicians are Certified Proficient in	
	Random Sampling (Hot Mix and Density Cores)
	Sample Size Reduction/Splitting
	Custody of Samples

TABLE A1 – TEST METHODS FOR QUALIFICATION OF SAMPLING AND TESTING PERSONNEL, Continued

Asphalt, continued	
Provisional Certification, continued	
Certification	**Asphaltic Concrete Technician Provisional Certification** **Training Coordinated By:** NDOT Materials & Research **Certification Required for:** NDOT New Hires/Temporary **Certification Expiration:** 1 Year **Certification Records Retained:** AWP **Authority:** Quality Assurance Manager or Designee
Technicians are Certified Proficient in	
AASHTO T 166	Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens
AASHTO T 168	Sampling Bituminous Paving Mixtures
AASHTO T 209	Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
AASHTO T 27	Sieve Analysis of Fine and Coarse Aggregate
AASHTO T 30	Mechanical Analysis of Extracted Aggregates
AASHTO T 84	Specific Gravity and Absorption of Fine Aggregate
AASHTO T 85	Specific Gravity and Absorption of Coarse Aggregate
AASHTO T 269	Volumetric Analysis of Compacted Hot Mix Asphalt (HMA)
AASHTO T 304	Uncompacted Void Content of Fine Aggregate
AASHTO T 248	Reducing Samples of Aggregate to Testing Size
ASTM D 5821	Determining the Percentage of Fractured Particles in Coarse Aggregate
AASHTO T 312	Preparing and Determining the Density of Hot Mix Asphalt (HMA) Specimens by Means of the SHRP Gyratory Compactor
AASHTO T 308	Asphalt Content of Hot Mix Asphalt (HMA) by the Ignition Method
AASHTO T 269	Percent Air Voids in Compacted Dense and Open Bituminous Mixtures
AASHTO T 2	Sampling Aggregate
NDT T 587	Density of Bituminous Concrete In-Place by Nuclear Method

APPENDIX B

LABORATORY/EQUIPMENT QUALIFICATION PROGRAM

B1. ***Purpose*** – This program provides uniform statewide procedures to ensure that laboratory facilities and equipment are adequate for performance of the required sampling and testing of materials.

B2. ***Scope*** – The scope of this program covers the qualification of all laboratories and equipment used for acceptance, verification, quality control, independent assurance and dispute resolution sampling and testing. The qualification of non-NDOT equipment is intended only to ensure that the equipment has been calibrated and/or verified on a regularly scheduled basis. The actual calibration and/or verification of equipment is the responsibility of the owner, unless otherwise required by NDOT. The Materials & Research Central Laboratory will calibrate branch laboratory equipment. All other NDOT-owned test equipment used for verification and independent assurance testing at the construction site will be calibrated by the quality assurance manager. Equipment may be subjected to calibration, verification or other inspection prior to qualification or through the independent assurance program.

B3. ***Laboratory/Equipment Qualification and Responsibility for Qualification*** – All laboratories that perform testing for NDOT require qualification. Laboratory and equipment qualification shall be as follows:

B3.1 *NDOT Materials & Research Central Laboratory* – The Materials & Research Central Laboratory shall be accredited through the AASHTO Accreditation Program.

B3.2 *NDOT Branch Laboratories* – Branch laboratories shall be qualified by the Materials & Research Central Laboratory.

B3.3 *Field Laboratories* – Field laboratories at construction sites generally consist of a laboratory building provided by a contractor and testing equipment owned and provided by NDOT.

B3.3.1 *Laboratory Building Qualification* – The laboratory building and any contractor furnished testing equipment shall be qualified by the NDOT branch laboratory quality assurance manager. The quality assurance manager may authorize other branch laboratory personnel to perform the laboratory building qualification.

B3.3.2 *Equipment Qualification* – NDOT owned testing equipment used in a field laboratory shall be qualified by the NDOT branch laboratory quality assurance manager. The quality assurance manager may authorize other branch laboratory personnel to perform equipment qualification activities.

B3.4 *Commercial Laboratories* –

B3.4.1 Commercial laboratories performing independent assurance testing or dispute resolution testing shall be accredited by the AASHTO Accreditation Program or a comparable laboratory program approved by the Federal Highway Administration. In addition, commercial laboratories performing independent assurance testing or dispute resolution testing must be qualified by the Materials & Research Division Central Laboratory to ensure that accreditation has occurred in the sampling and testing procedure being performed

B3.4.2 Commercial laboratories per-

forming contract quality control testing shall be qualified by the Materials & Research Central Laboratory or the branch laboratory quality assurance manager. The Materials & Research Central Laboratory shall determine the responsibility for qualifying commercial laboratories.

B3.5 *Contractor Laboratories* – Contractor laboratories, when performing quality control testing, shall be qualified by the Materials & Research Central Laboratory or a branch laboratory quality assurance manager. The Materials & Research Central Laboratory shall determine the responsibility for qualifying contractor laboratories. If the responsibility is assigned to the branch laboratory, the quality assurance manager may authorize other branch laboratory personnel to perform contractor laboratory qualification activities.

B3.6 *Vendor Laboratories (Material Suppliers)* – Vendor laboratories, when performing quality control testing, shall be qualified by the Materials & Research Central Laboratory or a branch laboratory quality assurance manager. The Materials & Research Central Laboratory shall determine the responsibility for qualifying vendor laboratories. If the responsibility is assigned to the branch laboratory, the quality assurance manager may authorize other branch laboratory personnel to perform vendor laboratory qualification activities.

B4 ***Equipment Qualification and Responsibility for Qualification*:**

B4.1 Non-specialized sampling and testing equipment is considered as a part of the laboratories identified in Section B3 even though the equipment may not be physically housed in the laboratory. Responsibility for qualification of the equipment is the same as in Section B3.

B4.2 Specialized sampling and testing equipment used for pay factor determination, material acceptance and/or material verification; that is, equipment not directly associated with one of the laboratories identified in Section B3, shall be qualified by the Materials & Research Central Laboratory. Specialized equipment, such as profilographs, lightweight deflectometers, and nuclear density gauges, will be identified by the Materials & Research Division.

B5*. Laboratory Qualification Process* – The laboratory authority identified in Section B3 shall perform the following functions:

B5.1 *Accredited Laboratories (Laboratories accredited through the AASHTO Accreditation Program.)*:

B5.1.1 Verify that the accreditation is current and has occurred in the sampling and testing procedures performed.

B5.2 *Non-accredited Laboratories (All laboratories except accredited laboratories and field laboratory buildings.)*:

B5.2.1 Identify the scope of testing to be performed by the laboratory.

B5.2.2 Verify that manuals and/or test methods used to perform the tests are available and current.

B5.2.3 Document that the laboratory has the required equipment to perform the tests.

B5.2.4 Check the calibration/verification records for each piece of equipment to include:

B5.2.4.1 Description of the equipment.

B5.2.4.2 Identification or serial number of the equipment.

B5.2.4.3 Identification of any traceable standard used for calibration.

B5.2.4.4 Frequency of calibration.

B5.2.4.5 Date of last calibration.

B5.2.4.6 Date of next scheduled calibration.

B5.2.4.7 Procedure used to calibrate equipment.

B5.2.4.8 Procedure used to identify equipment not in compliance.

B5.2.5 In addition, all equipment may be subjected to calibration/verification by the qualifying authority.

B5.3 *Field Laboratories (Laboratory Building)*:

B5.3.1 Verify that the laboratory building meets the requirements of the specification.

B5.3.2 Verify that the building, furnishings and utilities have been maintained to the extent that testing equipment and testing personnel will be adequately accommodated.

B6. *Frequency for Laboratory Qualification:*

B6.1 *Accredited Laboratories.*

B6.1.1 Accredited laboratories shall be qualified annually.

B6.1.2 If the laboratory has not previously been used by NDOT or has not been used within the past year, the laboratory must be qualified prior to performing any testing.

B6.2 *Non-accredited Laboratories* – Laboratories that have not been accredited through the AASHTO Accreditation Program shall be qualified at an interval not to exceed two years.

B6.3 *Field Laboratories (Laboratory Building)* – Contractor provided laboratory buildings shall be qualified as described in Section B5 at intervals not to exceed two years.

B6.4 The owner of the laboratory shall have the responsibility for requesting laboratory qualification to meet the frequency schedule identified in Section B6.

B7. *Laboratory Equipment – Calibration Procedures and Frequencies:*

B7.1 The frequency and procedures for calibrating/verifying testing equipment is shown in Table B1.

B7.2 The calibration procedure and frequency of calibration are applicable to equipment used for quality control testing, verification testing and independent assurance testing.

B7.3 Calibration procedures and frequencies shown herein may vary from those established by the AASHTO Accreditation Program. Laboratories requesting AASHTO accreditation or accreditation by a comparable laboratory program approved by the Federal Highway Administration shall comply with accreditation program requirements for calibration frequencies and procedures.

B7.4 The qualifying authority identified in Section B3 has the right to require calibration/verification of equipment at intervals more frequent than discussed herein if the performance of the equipment is suspect or if the equipment has been moved.

B8. *Documentation*.

B8.1 *Laboratory Qualification Records* – Copies of laboratory qualification records shall be kept on file as follows:

B8.1.1 One copy within the qualified laboratory.

B8.1.2 One copy by the qualifying authority as identified in Section B3.

B8.1.3 One copy by the Materials & Research Central Laboratory for any laboratory that is mobile or any commercial laboratory that may be performing testing in more than one district. It is the responsibility of the qualifying authority to submit documentation to the Materials & Research Central Laboratory.

B8.2 *Equipment Calibration/Verification Records:*

B8.2.1 Calibration/verification records for laboratory equipment shall be kept on file in the laboratory.

B8.2.2 Copies of calibration/verification records for NDOT owned equipment that is not normally a permanent part of a laboratory shall be kept on file as follows:

B8.2.2.1 One copy by the qualifying authority identified in Section B3.

B8.2.2.2 One copy by the district having ownership of the equipment.

B8.3 All laboratory qualification records and equipment calibration/verification records shall be kept on file for a period of three years.

B9. *Non-compliance*:

B9.1 Laboratories must meet the above requirements to become qualified. Laboratories failing to maintain the requirements contained herein are subject to disqualification.

B9.2 Any equipment failing to meet specified calibration/verification requirements for a specific test method shall not be used for that test method.

B10*. Dispute Resolution* – Disputes concerning laboratory qualification or calibration/verification of equipment that cannot be resolved at the district level will be submitted to the Materials & Research Central Laboratory for resolution. The decision of the Materials & Research Central Laboratory will be final. The Materials & Research Central Laboratory may obtain the services of an AASHTO accredited independent commercial laboratory to aid in resolving a dispute. This independent commercial laboratory must be independent of the original process. The decision to utilize the services of an independent commercial laboratory rests solely with the Materials & Research Central Laboratory.

TABLE B1 – EQUIPMENT CALIBRATION AND VERIFICATION FREQUENCY

Equipment Calibration and Verification Frequency			
Equipment	**Requirement**	**Interval (months)**	**Method**
Stand, Funnel and Cylindrical Measure	Verify	12	AASHTO T 304
Conical Molds and Tampers	Check Critical Dimensions - Verify	12	AASHTO T 84
Sample Splitter	Verify	12	AASHTO T 248
Breaking Head	Check Critical Dimensions - Verify	12	AASHTO T 245
Compression Test Machine	Calibrate	12	AASHTO T 245
Ignition Oven	Verify	12	AASHTO T 308
Gyratory Compactors	Calibrate	12	AASHTO T 312
Gyratory Molds and Ram Heads	Verify	12	AASHTO T 312
Marshall Molds	Verify	12	AASHTO T 245
Vacuum System	Calibrate	12	AASHTO T 209
Manual and Mechanical Compactors (Marshall)	Verify	36	AASHTO T245
PCC Air Meters	Verify	12	ASTM C231
Bearing Blocks	Check Planeness - Verify	12	ASTM C 39
Compression Test Machines	Calibrate	12	ASTM C 39
Moist Rooms/Storage Tanks	Check Temp. and Humidity – Verify	12	ASTM C 39
Capping Material	Strength – Verify	Each Lot	ASTM C 109
PCC Unit Weight Measures	Verify	12	ASTM C 138
Liquid Limit Device	Wear and Critical Dimensions - Verify	12	AASHTO T 89
Grooving Tool	Critical Dimensions – Verify	12	AASHTO T 89
Manual Soil Rammers	Weight and Critical Dimensions - Verify	12	AASHTO T 99 and 180
Mechanical Soil Rammers	Weight and Critical Dimensions - Verify	12	AASHTO T 99 and 180
Soil Molds	Check Critical Dimension / Volume Verify	12	AASHTO T 99 and T 180
Straightedges	Planeness of Edges - Verify	12	AASHTO T 99 and T 180
Balances, Scales and Weights	Verify	12	AASHTO M231
Ovens	Temperature Settings - Verify	12	See Sheet B-7
Mechanical Shakers	Sieving Thoroughness – Verify	12	AASHTO T 27
Sieves	Check Physical Condition - Verify	12	AASHTO M 92
Thermometers	Verify	12	ASTM E 77
Nuclear Moisture/Density Gauges	Calibrate*	12	Manufacturer's Recommendation

TABLE B1 – EQUIPMENT CALIBRATION AND VERIFICATION FREQUENCY, Continued

PROCEDURE FOR VERIFYING OVENS						
Equipment Checked	**Purpose**	**Inspection Equipment Required**	**Tolerance**	**Procedure**	**Interval (months)**	**Report**
Drying Ovens	This method provides instructions for checking drying ovens used in the laboratory.	A calibrated thermometer either Fahrenheit or Celsius graduated in 1.0° increments having a range which includes the temperature range to be checked.	Drying ovens shall be capable of maintaining a constant temperature range listed in the appropriate test methods	Place the thermometer inside the well with the clothespin attached to the thermometer. Position the thermometer on the shelf where the samples are normally dried.	12 Months	Send a copy of the results of each oven checked to the In-House Inspection Team for verification and issuance of a Certificate of Verification.
				Take the first reading at least 1 hour after closing the oven (oven should remain undisturbed).		
		A thermometer well to retain heat while the oven door is open.		Take as many readings as necessary to determine if the temperature range is within the specified tolerance (three consecutive readings, taken no less than ½ hr. apart, within the tolerance allowed are adequate).		
		A clothespin to hold thermometer in such a manner as to enable the operator to read the scale easily.		Adjust the temperature of the oven if an observed temperature reading is outside the tolerance specified (allow at least ½ hr. for the temperature to stabilize between each adjustment). Return to step 3.		

APPENDIX C

QUALITY CONTROL PROGRAM MINIMUM REQUIREMENTS

C1. ***General*** – When required by the specifications a "Quality Control Program" must be developed by the contractor and submitted as required by the contract for approval. Minimum requirements for a quality control program are identified herein. The specifications may require additional documentation or a more detailed quality control program than these minimum requirements. The specification requirement takes precedent over the minimum requirements described herein.

C2. ***Minimum Quality Control Program Requirements*****:**

C2.1 The contractor will provide, maintain and follow a quality control system that reasonably ensures the materials and work incorporated into the project conforms to the contract requirements.

C2.2 The contractor shall provide qualified sampling and testing personnel to perform quality control inspection, sampling and testing required by the contract

C2.3 The contractor will develop a quality control plan and submit it to the engineer for review and approval as identified in the specifications. The contractor's quality control plan may include quality control plans developed by subcontractors and/or vendors. As a minimum the quality control plan will:

C2.3.1 Include the project number, signature and date of signing by the contractor's authorized representative.

C2.3.2 Identify the laboratory(s) to be used.

C2.3.3 Provide an organization structure identifying:

C2.3.3.1 The program administrator and names of sampling and testing personnel.

C2.3.3.2 The qualifications, experience and level of authority of the program administrator.

C2.3.3.3 The certificate numbers and duties of all sampling and testing personnel.

C2.3.3.4 Include a sampling, testing and analysis plan with frequencies, location of sampling and methods of testing and analysis.

C2.3.3.5 Include procedures for documenting quality control activities.

C2.3.3.6 Address corrective actions to be taken when quality control and/or acceptance criteria are not met.

C2.3.3.7 Address methods used to control product quality that cannot be adequately addressed by product testing.

C2.4 The provisions of the quality control program apply to the material and construction furnished under the contract. The quality control program must, to the satisfaction of the engineer, deal with issues affecting the achievement of a quality product, including workmanship, construction methods, plant operations, and sampling and testing methods.

APPENDIX D

ACCEPTABLE TOLERANCE LIMITS FOR INDEPENDENT ASSURANCE SPLIT OR PROFICIENCY SAMPLES

Acceptable Tolerance Limits for Independent Assurance Split or Proficiency Samples				
Material	**Test Procedure**	**Standard**	**Test Method**	**Split Sample Tolerance**
Portland Cement Concrete Coarse Aggregate	Gradation	NDT T 27	Split or *Proficiency	
	> No. 4			T 27, Table 2 Multi-lab Precision
	≤ No. 4			T 27, Table 2 Multi-lab Precision
Portland Cement Concrete Fine Aggregate	Gradation	NDT T 27	Split or *Proficiency	
	3/8" thru No. 200			T 27, Table 2 Multi-lab Precision
Portland Cement Concrete Fresh Concrete	Yield	ASTM C 138	Split or *Proficiency	± 3%
	Slump	ASTM C 143		± 1.0 in.
	Air Content	ASTM C 138		± 1%
	Cylinder and Strength	ASTM C 31		20% of the mean**
* See footnote page 28-D-4				
** See footnote page 28-D-4				

Material	**Test Procedure**	**Standard**	**Test Method**	**Split Sample Tolerance**
Embankment	In-Place Density	AASHTO T 238	Split or *Proficiency	± 2.5%
	In-Place Moisture	AASHTO T 239		± 1.5%
Subgrade	In-Place Density	AASHTO T 238	Split or *Proficiency	± 2.5%
	In-Place Moisture	AASHTO T 239		± 1.5%
Granular Foundation Course (Regular)	Gradation	NDT T 27	Split or *Proficiency	T 27, Table 2 Multi-lab Precision
	In-Place Density	AASHTO T 238		± 2.5%
	In-Place Moisture	AASHTO T 239		± 1.5%
* See footnote page 28-D-4				

ACCEPTABLE TOLERANCE LIMITS FOR INDEPENDENT ASSURANCE SPLIT OR PROFICIENCY SAMPLES, Continued

Material	Test Procedure	Standard	Test Method	Split Sample Tolerance	
Asphalt Concrete (Superpave) Coarse Aggregate	Coarse Aggregate Angularity	ASTM D 5821	Split or Proficiency	± 10.0%	
Asphalt Concrete (Superpave) Fine Aggregate	Fine Aggregate Angularity	AASHTO T 304 (Method A)	Split or Proficiency	± 0.5%	
Asphalt Concrete (Superpave) Combined Aggregate	Gradation	AASHTO T 30	Split or Proficiency	3/4 in (19 mm)	5% Tolerance
				1/2 in (12.5 mm)	
				3/8 in (9.5 mm)	
				No. 4 (12.5 mm)	
				No. 8 (2.36 mm)	
				No.16 (1.18 mm)	4% Tolerance
				No. 30 (600 µm)	
				No. 50 (300 µm)	
				No. 200 (75 µm)	2% Tolerance
Asphalt Concrete (Superpave) Complete Mixture	Asphalt Content	Ignition Oven AASHTO T 308	Split or Proficiency	± 0.5%	
	Gyratory Compaction	AASHTO T 312		Visual Observation	
	Air Voids	AASHTO T 269		± 1.0%	
	Bulk Specific Gravity	AASHTO T 166		± 0.020	
	Theoretical Maximum Specific Gravity	AASHTO T 209		± 0.015	
Note: For specialty mixes see special provisions.					

Material	Test Procedure	Standard	Test Method	Split Sample Tolerance
Asphalt Concrete (Conventional) Combined Aggregate	Gradation	AASHTO T 30	Split or Proficiency	
	>5/8"			± 5%
	5/8" thru No. 200			± 3%
	Passing No. 200			± 1.5%
Asphalt Concrete (Conventional) Complete Mixture	Asphalt Content	Ignition Oven AASHTO T 308	Split or Proficiency	± 0.5%
	Marshall Compaction	AASHTO T 245		Visual Observation
	Air Voids	AASHTO T 269		± 1.0%
	Voids in Mineral Aggregate	Calculated		-1.00 to +1.25 From Min.
	Bulk Specific Gravity	AASHTO T 166		± 0.020
	Theoretical Maximum Specific Gravity	AASHTO T 209		± 0.015

ACCEPTABLE TOLERANCE LIMITS FOR INDEPENDENT ASSURANCE SPLIT OR PROFICIENCY SAMPLES, Continued

Footnotes	
*The Federal Proficiency Sample Testing Program rating scale will be used. The program uses a scale of 1 to 5. When a rating of 2 or lower is achieved corrective action shall be taken. The ratings have no valid standing beyond showing the difference between the individual's results and the average for a particular test.	
Ratings	**Range (Number of Standard Deviations)**
5	Less than 1
4	1 to 1.5
3	1.5 to 2
2	2 to 2.5
1	Greater than 2.5
**The difference between compared test results shall not exceed the indicated percentage of the mean of the compared test results – the mean being the average of the two test results.	
EXAMPLE: Portland Cement Concrete Compressive Strength	
Job control test value	3,000 psi
Independent Assurance test value	4,000 psi
Mean	3,500 psi
20% difference	700 psi
Both values are within 20% of the mean	

APPENDIX E

LETTER OF CERTIFICATION BY STATE ENGINEER

Division Administrator
U. S. Department of Transportation
Federal Highway Administration
Lincoln, Nebraska

Date: _____
Nebraska Project No.: _____
Location: _____
Contractor: _____
Type of Work: _____

This is to certify that:

The results of the tests used in the acceptance program indicate that the materials incorporated in the construction work, and the construction operations controlled by sampling and testing, were in conformity with the approved plans and specifications. All independent assurance samples and tests are within tolerance limits of the samples and tests that are used in the acceptance program.

Exceptions to the plans and specifications are explained on the attached sheet.

Sincerely

Materials & Research Engineer

_____ Additional Materials Certifications will be required for this project.

_____ This is the only Materials Certification required for this project.

_____ This is the final Materials Certification required for this project. Previous certifications were sent on the dates indicated below.

Contractor	Type of Construction	Date Sent
_____	_____	_____
_____	_____	_____

APPENDIX F

Nebraska Department of Transportation
Annual Report to FHWA On System Wide Approach of Independent Assurance Testing
National Highway System

Annual FHWA IA Program Report

Introduction

As required by 23 CFR 637 (B), the intent of this document is to report the results of NDOT's annual compliance assessment of the system approach to independent assurance on the National Highway System. NDOT does not currently have a compliance percentage goal established, however we anticipate revisiting this, upon completion of data driven tracking methods for these certifications.

General Project and Lab Information Federally Funded Projects Under Construction	
Project Type	**Number of Projects**
Federally Funded State Projects	
Federally Funded LPA Projects	
Total	

Assessment of Lab Qualifications for Federally Funded Projects			
Material	**Lab Type**	**Number of Labs that Performed Sampling and/or Testing**	**Number of Labs that Performed Sampling and/or Testing and were Qualified by NDOT or Maintain AASHTO Accreditation**
Asphalt	Contractor Labs		
	LPA Labs		
	Consultant Labs		
Concrete	Consultant Labs		
	LPA Labs		
Soil	Consultant Labs		
	LPA Labs		
Statewide Corrective Action:			
	Asphalt		
	Concrete		
	Soils		

NDOT QA Program Totals		
	Total Technician Certifications/Total Required	**Percentage**
Technician Certifications		
Technician IAs		

Assessment of Technician Certification: Federally Funded State Projects Projects that Required a Certified Material Tester	
Project Types	**Number of Projects Assessed**
Asphalt	
Concrete	
Soil	

Assessment of Technician Certification Status					
Project Types	**Required Certifications**	**A Number of Technicians that Performed Sampling and/or Testing for Acceptance that Required Certification**	**B Number of Technicians that Performed Sampling and/or Testing for Acceptance and were Certified**	**C Number of Technicians that Performed Sampling and/or Testing for Acceptance and were Provisionally Certified**	**D Percent of Technicians who were Certified to Perform the Sampling and/or Testing for Acceptance they Performed ((B + C) / A) x 100**
Asphalt	Asphaltic Concrete Technician				
Concrete	ACI Concrete Field Testing Technician				
	ACI Concrete Strength Testing Technician				
	Profilograph Operator				
Soil	Earthwork Technician I				
	Earthwork Technician II				
Statewide Corrective Action:					
	Asphalt				
	Concrete				
	Soils				

Assessment of Technician Certification Status			
Project Types	**Required Certifications**	**E Number of Certified Technicians who met System Approach Obligations for Independent Assurance**	**F Percent of Certified Technicians who Performed Sampling and/or Testing and met IA Obligations (E / (B + C)) x 100**
Asphalt	Asphaltic Concrete Technician		
Concrete	ACI Concrete Field Testing Technician		
	Profilograph Operator		
Soil	Earthwork Technician I		
	Earthwork Technician II		
Statewide Corrective Action:			
	Asphalt		
	Concrete		
	Soils		

Assessment of Technician Certification: Federally Funded LPA Projects Projects that Required a Certified Material Tester	
Project Types	**Number of Projects Assessed**
Asphalt	
Concrete	
Soil	

Assessment of Technician Certification Status					
Project Types	**Required Certifications**	**J Number of Technicians that Performed Sampling and/or Testing for Acceptance that Required Certification**	**K Number of Technicians that Performed Sampling and/or Testing for Acceptance and were Certified**	**L Number of Technicians that Performed Sampling and/or Testing for Acceptance and were Provisionally Certified**	**M Percent of Technicians who were Certified to Perform the Sampling and/or Testing for Acceptance they Performed ((K + L) / J) x 100**
Asphalt	Asphaltic Concrete Technician				
Concrete	ACI Concrete Field Testing Technician				
	ACI Concrete Strength Testing Technician				
	Profilograph Operator				
Soil	Earthwork Technician I				
	Earthwork Technician II				
Statewide Corrective Action					
	Asphalt				
	Concrete				
	Soils				

Assessment of Technician Certification Status			
Project Types	**Required Certifications**	**N Number of Certified Technicians who met System Approach Obligations for Independent Assurance**	**O Percent of Certified Technicians who Performed Sampling and/or Testing and met IA Obligations (N / (K + L)) x 100**
Asphalt	Asphaltic Concrete Technician		
Concrete	ACI Concrete Field Testing Technician		
	ACI Concrete Strength Testing Technician		
	Profilograph Operator		
Soil	Earthwork Technician I		
	Earthwork Technician II		
Statewide Corrective Action			
	Asphalt		
	Concrete		
	Soils		

APPENDIX G

FHWA LETTER OF APPROVAL FOR THE MATERIALS SAMPLING GUIDE AND QUALITY ASSURANCE PROGRAM FOR CONSTRUCTION

NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION

August 31, 2026

Abe Anshasi
Engineering and Operations
FHWA, Nebraska Division

Sections of the Materials Sampling Guide have been updated from the previous version. Enclosed is the list of changes included in this revision. Upon approval, please record your signed concurrence on this letter, to be included with this publication.

Sincerely,

Brendon J. Schmidt, P.E.
Materials and Research Engineer

8-31-2026
Date

Abe Anshasi
FHWA Approval Authority
Nebraska Division

9-23-2026
Date

Enclosures

Vicki Kramer, Director
Department of Transportation
Materials & Research Division
1400 Nebraska Parkway
PO Box 94759
Lincoln, NE 68509-4759
OFFICE 402-479-4760 FAX 402-479-3975
DOT.Contactus@nebraska.gov
dot.nebraska.gov

NEBRASKA DEPARTMENT OF TRANSPORTATION

Policies

Materials Sampling Guide, Section 29

Policy for Precast/Prestressed Concrete Plant Inspection
NDOT Inspector

Required Certification: ACI Field Test Technician Grade I; NDOT Field Technician; NDOT Plant Technician

Recommended Certification: ACI Strength Test Technician Grade I; PCI Quality Control Personnel Certification Level I and II

General: Refer to Section 705 in the 2007 Standard Specification for Highways, and all supplements to the standard specifications.

Each inspector is expected to perform any or all tasks within the non-administrative area of prestressed concrete inspection and control. NDOT inspectors may observe and/or verify their assigned tasks. Production tasks may continue even though an NDOT inspector is not present to observe the task, provided the production schedule has been given to the NDOT inspector, and the work is proceeding according to schedule. The definition of 'Verify' is that NDOT inspectors will review plant inspector's written documentation of the task or perform separate tests. All inspectors shall obtain the required certification and should obtain the recommended certification.

Inspectors shall comply with all of the safety programs prescribed by the facility. All personnel are required to wear safety hard hats, safety footwear, and safety glasses while observing and/or verifying the work in the production area.

1. One sample of prestress strand twelve feet long from each reel shall be submitted to Materials & Research for testing 30 days before the anticipated time of use. (NDOT Standard Specifications for Highway Construction, 705.02 paragraph 14)
2. Inspection and recording of tensioning.
    A. The NDOT inspector shall observe and/or verify the tensioning of all strands.
    B. A small number of broken wires are acceptable in a setup as long as the number is limited to not more than 2%.
        1. The area of broken wires shall not exceed 2% of the cross sectional area of the stressing strand. (705.02, 10)
        2. No more than 1 broken wire will be allowed in a single strand. (705.02, 12)

General

1. Checking of dimensions of members, numbers, size and positions of tendons, reinforcing steel, other incorporated materials, opening, blockouts, etc.
    A. After the plant inspector has notified NDOT inspector the bed is ready to be reviewed, the NDOT inspector may observe and/or verify the bed.
    B. All reinforcing steel shall be observed or verified to ensure the bars are of the correct type and size and have been placed in the proper location.
    C. The type, size, anchorage, and location of all embedded items shall be observed and/or verified.
    D. The NDOT inspector should perform checks as needed to verify the quality control department data.
2. Regular inspection of batching, mixing, conveying, placing, compacting, finishing and curing of concrete.
    A. Precast/Prestressed Portland cement concrete production facilities shall comply with the requirements in the Precast/Prestressed Concrete Institute (PCI) for certified plants.

1. Whenever there is reason to suspect a problem with the equipment, any or all of the equipment may be inspected.

B. Precast plants that are not PCI certified will be NRMCA certified.

3. Preparation of concrete specimens for strength testing and performance of concrete tests (slump, air content, unit weight, etc.).

A. Concrete testing verification shall be the responsibility of the NDOT inspector. Table 705.03 shows the minimum required sampling and testing. The engineer may make more verification test samples if the quality of the plants testing is deemed inadequate.

B. The NDOT inspector shall observe and/or verify the sampling, fabrication and testing for all specimens.

4. Inspection of de-tensioning, product removal from beds, handling and storing operations.

A. The NDOT inspector shall observe and/or verify the de-tensioning.

1. De-tensioning shall be accomplished before the temperatures of the units drop more than 60 degrees from the maximum cure strength temperature and while they are still moist. (705.03, 9)

2. After de-tensioning, prestressed concrete girder shall be inspected for cracking. If any cracks are discovered in the middle of the girder on the bottom flange face, the girder shall be rejected. (703.03,9.9.C)

B. Verifying of dimensions of members, camber, numbers, opening, blockouts, etc.

1. The quality control department shall notify the NDOT inspector when the product is ready to be reviewed.

2. The NDOT inspector may perform checks to verify the quality control department data.

C. Each precast/prestressed concrete structural unit shall be stamped or marked with an identification number and its manufacture date. (705.03, 8g)

D. Initial camber should be recorded on all prestressed concrete products for which cylinders are made and initial camber measurement is appropriate.

E. Visual inspection of the product for strand slippage should be monitored and evaluated. If slippage occurs, the Construction Division shall be notified, and the girder will be evaluated.

5. Final inspection of finished product prior to shipment.

A. Verify the product has been marked with a number and date related to shop drawings and product records for accurate identification. Green label is placed on end of girder for final approval.

B. Visual inspection of the product for general appearance should be made. Cracking is frequently indicative of incorrect procedures in design, production, or handling.

C. The NDOT inspector shall observe and/or verify the post-pour inspection.

6. General observation of plant equipment, working conditions, weather, and other items, which have the potential for affecting the products.

7. All products sent to state projects shall be accompanied by a shipping ticket. The NDOT inspector will be given the opportunity to perform a final inspection before it leaves the plant.

<u>Precast/Prestress Inspection Records and Reports</u>

The filing pattern outlined below has been devised to ensure the integrity and uniformity of files kept in the inspector's plant file. It is expected that all such files will be kept in order and up to date.

1. Correspondence File material shall be filed by date with current data at the front of the file and cross referenced by date of letter, date received, person receiving, also those acting upon correspondence.

A. State of Nebraska

B. Producer

C. Miscellaneous

2. Materials and Tests Section
   A. Field Gradations
      1. Fine Aggregate
      2. Coarse Aggregate
   B. Sampling Identification material shall be filed by date/report number (certifications are filed with report.)
      1. Fine Aggregate
      2. Coarse Aggregate
      3. Portland Cement
      4. Admixtures
      5. Prestressed Strand
      6. Concrete Reinforcing Steel
      7. Cold Rolled Steel
      8. Welded Wire Fabric
      9. Structural Wire Mesh
      10. Miscellaneous
3. Materials & Research inspectors shall record the following:
   A. Compressive Strength Report
      1. Project Number if known
      2. Unit Identification from plans
      3. Date Fabricated
      4. Proportioning Report Number
      5. Test Date
      6. Maximum Machine Load
      7. Compressive Strength
      8. Stress/ Strain Data
   B. Stress/Drain Data
   C. Shipping Report
      1. Project Number
      2. Unit Identification from plans
      3. Date Fabricated
      4. Date Shipped
      5. Length of each Pile or Girder

<u>NDOT Inspector Checklist for Steam Curing</u>

1. Verify temperature sensor or thermometer locations.
   A. One approved continuous recording thermometer or sensor for each 115 feet of casting bed, with a minimum of 2 thermometers or sensors located in each enclosure.
2. Verify that steam jets are not directed at the forms.
3. Anything that causes the forms to heat up at a faster rate than the concrete can cause problems.
   A. Verify that the temperature of the concrete is maintained near placement temperature until the concrete has reached initial set.
   B. Verify that the temperature rate of rise does not exceed 60°F per hour after initial set.
   C. Verify that the temperature did not exceed 175°F.
4. Verify that the relative humidity inside the enclosure is maintained between 70% and 100%.
5. Verify that the temperature in the concrete is maintained so that the difference between highest and lowest temperature station readings will not be more than 30°F.
   A. A dial thermometer pushed through the holes in the tarp works well for checking the temperature along the unit(s).

B. There must be adequate room, 3 inches minimum, for the steam to circulate all the way around the forms.
C. Wind can blow the tarps against the forms and completely stop the steam from circulating around the units.
D. Make sure the end of the bed is well protected and that there is as much steam getting to the ends as the rest of the bed.
E. Wind blowing in the end of the bed can drastically reduce the temperature.

Elongation Instructions

Elongation shall follow the recommended practice of the Precast/Prestressed Concrete Institute except as out lined below or stated on the plans. The plant inspector shall peform elongation calculations with a report submitted to the NDOT inspector for verification.

1. Calculate the elongations using the equation on page 36 of the PCI Quality Control Technician/Inspector Training Manual.
   A. The central laboratory shall determine the Modulus of Elasticity.
   B. Initial tension should be from 5% to 25% of the final load, to pull the slack strand taut.
   C. Strands are tensioned to approximately 70% of their ultimate capacity except where the plans indicate otherwise.
   D. Tolerance based on the PCI Quality Control Manual is ± 5% from the desired value. This relates to the actual gage pressure and elongation verses the calculated values of each. It also relates to an algebraic comparison of the variation of the gage pressure to variations in elongations.
2. Tensioning corrections for elongation and load are:
   A. Strand Seating
      1. Dead End Seating
      2. Live End Seating
      3. Splice Chuck \Seating
   B. Bed shortening for self-stressing beds
   C. Abutment rotation of movement of anchorages for fixed abutment beds
   D. Elongation of abutment anchor rods
   E. Thermal effects
   F. Drape
3. The NDOT inspector verifies the elongation calculations were performed by use of the following DR forms:
   A. DR 349, Single Strand Elongation for Piles and Inverted Tee’s
   B. DR 350, Multistrand Elongation for Girders
   C. DR 351, Draped Single Strand Elongation Form for Girders
   D. DR 353, Draped Strand Angle Schematic

Policy for Precast/Prestressed Concrete Plant Inspection
Fabricator Inspector

Required Certification: ACI Field Test Technician Grade I; NDOT Field Technician; NDOT Plant Technician; PCI Quality Control Personnel Certification Level I and II

Recommended Certification: ACI Strength Test Technician Grade I

General: Refer to Section 705 in the 2007 Standard Specification for Highways, and all supplements to the standard specifications.

Each inspector is expected to perform any or all tasks within the non-administrative area of prestressed concrete inspection and control. Thus, all inspectors shall obtain the required certification and should obtain the recommended certification.

1. Identification, examination, acceptance and plant testing of materials and subassemblies.
   A. All precast/prestressed concrete structural units shall be produced in a Precast/Prestressed Concrete Institute (PCI) certified plant.
   B. The contractor shall provide the NDOT inspector a 4-week production schedule that is updated as necessary. If the NDOT inspector is given less than 1 NDR workday's notice of a schedule change, then the fabricator may not proceed until the engineer has reviewed the change. The engineer may observe any or all of the procedures and shall have access to all reported data at any time during fabrication. The NDOT inspector shall report any inconsistencies to the job superintendent and note them in the plant diary. (NDOT Standard Specifications for Highway Construction 705.03, paragraph 5)
   C. Quality control records should be identified with the same job number, piece number, and project number, if known, and other information as used to identify the product after inspection.
   D. One sample of prestress strand twelve feet long from each reel shall be submitted to the NDOT inspector for testing 30 days before the anticipated time of use. (NDOT Standard Specifications for Highway Construction,705.02 paragraph 14)
2. Inspection and recording of tensioning.
   A. Tensioning of all strands shall be done in the presence of the NDOT inspector.
   B. A small number of broken wires are acceptable in a setup as long as the number is limited to not more than 2%.
      1. The area of broken wires shall not exceed 2% of the cross sectional area of the stressing strand. . (705.02, 10.)
      2. No more than 1 broken wire will be allowed in a single strand. (705.02, 12.)
3. Inspection of beds and forms prior to concreting.
   A. One of the most important inspections functions is the pre-pour inspection. It is much easier to make corrections before concrete is placed.
   B. The overall length, width, thickness, and other basic dimensions should be checked on all sides of the form before concrete placement begins.
4. Checking of dimensions of members, numbers, size and positions of tendons, reinforcing steel, other incorporated materials, opening, blockouts, etc.
   A. The quality control department shall notify the NDOT inspector when a set-up is ready to be reviewed.
   B. All reinforcing steel shall be reviewed to ensure the bars are of the correct type and size and have been placed in the proper location.
   C. The type, size, anchorage and location of all embedded items shall be checked.
   D. The NDOT inspector may occasionally perform checks to verify the quality control department data.
5. Regular inspection of batching, mixing, conveying, placing, compacting, finishing and curing of concrete.

A. Precast/Prestressed Portland cement concrete production facilities shall comply with the requirements in the Precast/Prestressed Concrete Institute (PCI) for certified ready mix plants.
   1. Whenever there is reason to suspect a problem with the equipment, any or all of the equipment may be inspected.

B. B. Precast plants that are not PCI certified will be NRMCA certified

6. Preparation of concrete specimens for strength testing and performance of concrete tests (slump, air content, unit weight, etc.).

A. Concrete quality control shall be the responsibility of the Contractor. Concrete shall be sampled and tested as shown in Table 705.03.

7. Inspection of de-tensioning, product removal from beds, handling and storing operations.

A. De-tensioning shall be done in the presence of the NDOT inspector.
   1. De-tensioning shall be accomplished before the temperatures of the units drop more than 60 degrees from the peak cure strength temperature and while they are still moist. (705.03 paragraph 9.b.(9))
   2. After De-tensioning prestressed concrete girder shall be inspected for cracking. If any cracks are discovered between quarter points in the middle of the girder on the bottom flange face, the girder shall be rejected. 703.03,9.9.C)

B. Verifying of dimensions of members, camber, numbers, opening, block outs, etc.
   1. The quality control department shall notify the NDOT inspector when the product is ready to be reviewed.
   2. The NDOT inspector may occasionally perform checks to verify the quality control department data.

C. Before products are moved into storage, the NDOT inspector shall evaluate the product for deficiencies. This may be done while in the storage area if the NDOT inspector has complete access to the product.

D. To identify the condition of a product as it moves through plant operations, paint marks shall be placed on the ends of the girders by the NDOT inspector.
   1. Products marked with red paint are to identify reject items.
   2. Products marked with yellow paint should have their defects evaluated and repaired. Once the repair is complete and accepted, the yellow paint is covered with green paint.
   3. Products marked with green paint are approved for shipment at the appropriate time.

E. Each precast/prestressed concrete structural unit shall be stamped or marked with an identification number and its manufacture date, by the NDOT inspector. (705.03, 8g)

F. Initial camber should be recorded on all prestressed concrete products for which cylinders are made and initial camber measurement is appropriate.

G. Visual inspection of the product for strand slippage should be monitored and evaluated. If slippage occurs, the Construction Division shall be notified and the girder will be evaluated.

8. Final inspection of finished product prior to shipment, by NDOT inspector.

A. Verified the product has been marked with a number and date related to shop drawings and product records for accurate identification. Green label is placed on end of girder for final approval.

B. Visual inspection of the product for general appearance should be made. Cracking is frequently indicative of incorrect procedures in design, production, or handling.

9. General observation of plant equipment, working conditions, weather and other items, which have the potential for affecting the products.

10. All products sent to state projects shall be accompanied by a shipping ticket. The NDOT inspector shall confirm the shipment before it leaves the plant.

Elongation Instructions

Elongation shall follow the recommended practice of the Precast/Prestressed Concrete Institute except as out lined below or stated on the plans. Elongation calculations shall be preformed by the plant inspector with a report submitted to the NDOT inspector for verification.

1. Calculate the elongations using the equation on page 36 of the PCI Quality Control Technician/Inspector Training Manual.
   A. The central laboratory shall determine the Modulus of Elasticity.
   B. Initial tension should be from 5% to 25% of the final load, to pull the slack strand taut.
   C. Strands are tensioned to approximately 70% of their ultimate capacity, except where the plans indicate otherwise.
   D. Tolerance based on the PCI Quality Control Manual is ± 5% from the desired value. This relates to the actual gage pressure and elongation verses the calculated values of each. It also relates to an algebraic comparison of the variation of the gage pressure to variations in elongations.
2. Tensioning corrections for elongation and load are:
   A. Strand Seating
      1. Dead End Seating
      2. Live End Seating
      3. Splice Chuck Seating
   B. Bed shortening for self-stressing beds
   C. Abutment rotation of movement of anchorages for fixed abutment beds
   D. Elongation of abutment anchor rods
   E. Thermal effects
   F. Drape

Policy for Precast/Prestressed Concrete Products Grooming and Repair Procedures

Any repairs, surface preparation, or grooming required on prestressed girders or prestressed piling shall be performed by the PCI-certified prestress producer in accordance with the latest edition of the *Manual for the Evaluation and Repair of Precast, Prestressed Concrete Bridge Products* published by the Precast/Prestressed Concrete Institute (PCI).

Acceptance Policy for Portland Cement and Interground/Blended Cement

General

These instructions cover the acceptance procedures for Portland-Limestone Cement (IL), Portland-Pozzolan Cement (IP), Portland-Slag Cement (IS), or Ternary-Blended Cement (IT) supplied for use in Nebraska state highway construction and maintenance projects. Any Interground/Blended Cement that hasn't been used in Nebraska for two years shall be removed from the Nebraska Qualified Material Vendors List (NQMVL).

The State of Nebraska's Standard Specifications for Highway Construction, Special Provisions, Supplemental Specifications, and Materials Sampling Guide are part of these instructions. This acceptance policy includes all shipments by rail, truck, or barge supplied directly to contractors through suppliers or ready-mix plants.

Certified Mill Analysis:

IL and Interground/Blended cement mills are required to furnish the Nebraska Department of Transportation (NDOT) Materials & Research Division (M&R) a copy of their certified mill analysis each time the cement is produced for use in NDOT projects. The certified mill analysis report shall include the following:

- Mill location,
- Percent of IL and Interground/Blended cement,
- Grinding period,
- Associated manufacturer product name,
- IL and Interground/Blended cement shall conform to ASTM C 595.

Nebraska Qualified Material Vendors List:

IL and Interground/Blended cement on the NQMVL can be used on the project when accompanied by a manufacturer's certification. The requirements for being on the NDOT's NQMVL are:

Option 1:

1. Twenty consecutive passing mill samples, and each sample will represent five separate grinds or blends. The manufacturer shall randomly collect samples in separate grinds or blends to create a composite sample of ten pounds for IL cement or a fifteen pounds for IP, IS, or IT. The sample will be tested at the NDOT central laboratory.
2. The mill analysis and the NDOT test results for the twenty consecutive passing samples shall conform to one of the following:
    A. IL cement shall conform to ASTM C 595.
    B. Interground/Blended cement shall conform to ASTM C 595.
        i. Report the type and percentage of each supplemental cementitious materials (SCMs) used for final product.
        ii. Report the total cementitious replacement in accordance with ASTM C 595.
            1. Refer to subsection 1004.02, paragraph 2.
        iii. Submit a passing test for ASTM C 1567 or AASHTO T 380.
            1. Refer to subsection 1004.04, paragraph 3 of the Nebraska Standard Specification for Acceptance Requirements.
3. If there is a change to SCM source, the manufacturer shall notify the PCC Engineer of the change and follow paragraph 1.

Option 2:

1. IL and Interground/Blended cement may be accepted with the approval of the Portland Cement Concrete Engineer and a signed reciprocity agreement with another highway state agency. The IL cement or Interground/Blended cement must meet NDOT specifications.

Sampling Procedure at Mill or Blender:

The IL, IP, IS or IT sample shall be taken on the first production day of each month for each type produced. The sample will be a composite of that day's production. Each sample will be shipped in a leak and moisture-resistant container and will be identified with the location and name of the production mill, type of cement, date produced, and storage bin number. The accompanying paperwork, including the mill analysis, shall be for the sample being submitted to NDOT and placed in a sealed envelope.

Sample Shipping:

The samples are to be shipped to the NDOT central laboratory at the address listed below. The manufacturer will be responsible for the cost of shipping.

When using Ground Shipping:
Portland Cement Concrete Laboratory
Nebraska Department of Transportation
Materials & Research Division
1400 Nebraska Parkway
Lincoln, Nebraska 68502

Certificates of Compliance:

The producing mills shall issue certificates of compliance. Copies of the certificates must accompany each load from a terminal. The forms must include the following:

- Name and location of the producing cement mill,
- Consignee and destination of the shipment,
- Date shipped from the producing mill (not the date shipped from the terminal),
- Railroad car or truck identification number,
- Manufacturer and type of IL or Interground/Blended cement,
- Quantity of IL or Interground/Blended cement shipped,
- Certified test number, date, and bin or silo number.

Each form for a truck shipment must include a unique order number or identification number. The following signed certification statement or similar wording must also be included on the form.

I, (NAME) certify the shipment of cement was taken from the indicated bin and that it meets the specifications requirements of the Nebraska Department of Transportation.

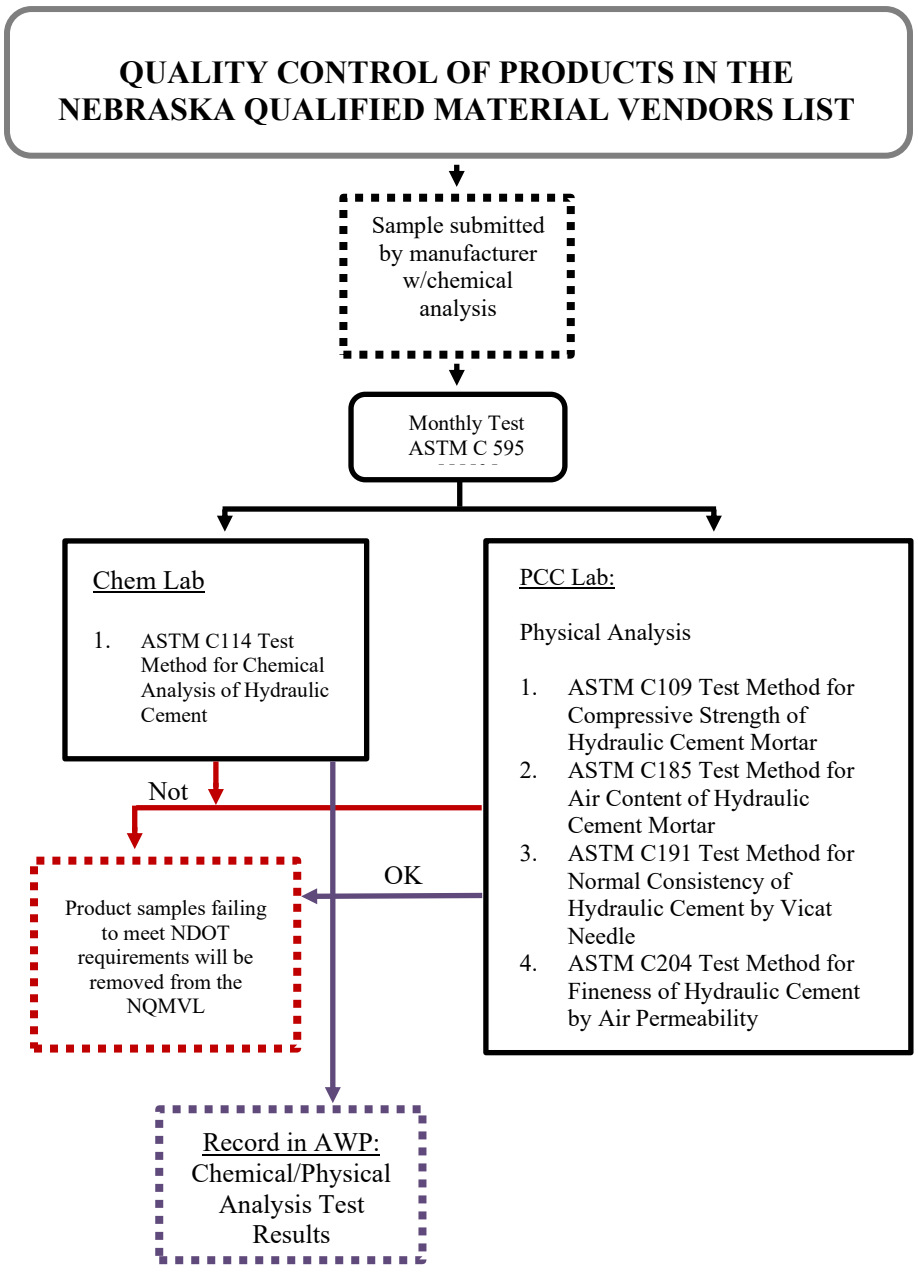
This certification must be signed at the mill loading site or at the terminal location. When IL or Interground/Blended cement is shipped from a terminal, a copy of the mill certification must accompany the load. The actual quantity shipped to a ready-mix plant or job site must be specified on the certification.

Sampling From Bulk Shipment Railroad Car, Truck, or Batch Plant Silo:

Refer to NDT S01, the Method of Sampling for IL and Interground/Blended Cement, which can be found on the Materials & Research website (Nebraska Modified Test Standards).

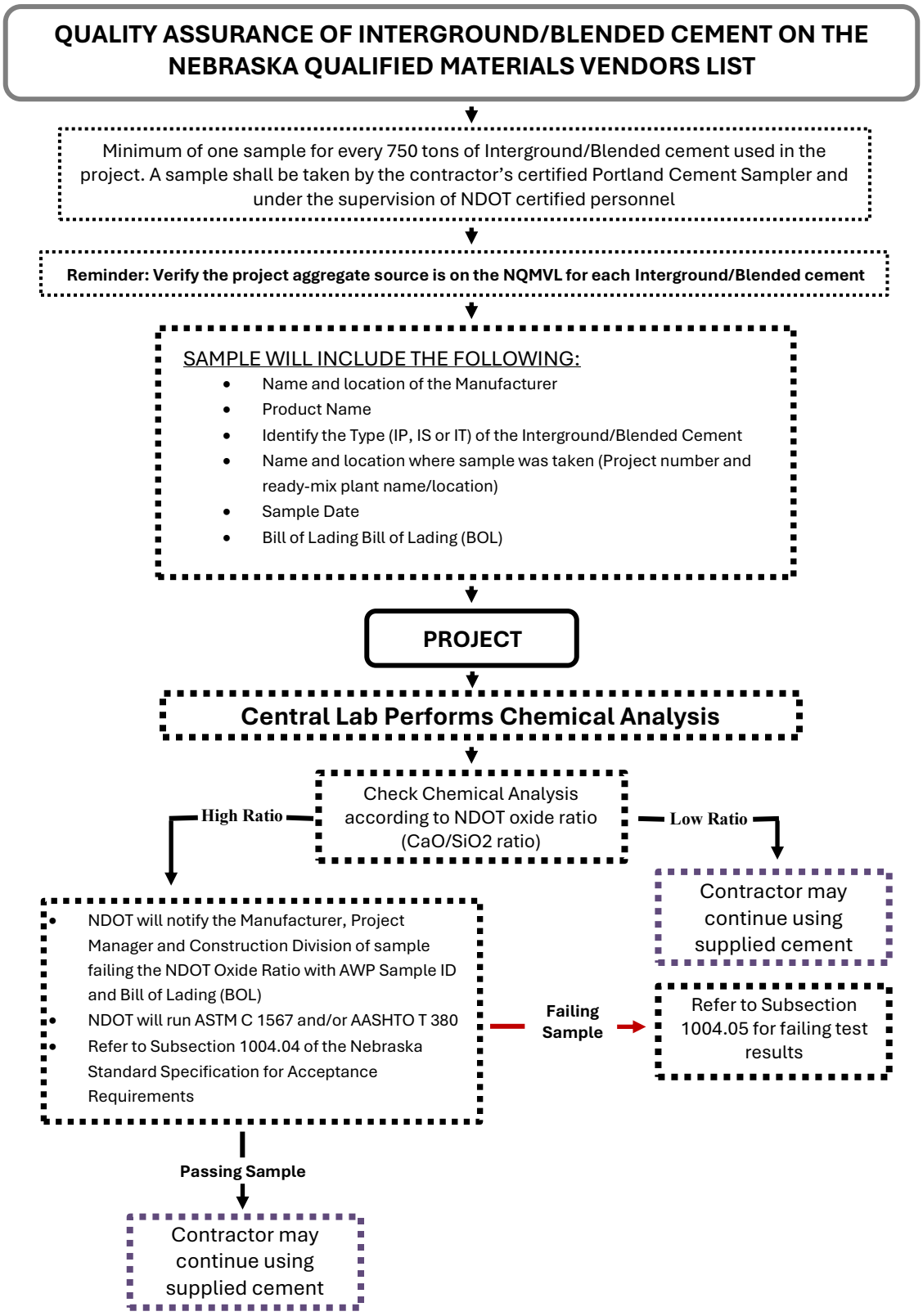
Quality Control of Portland Cement:

The Materials & Research Division has established the following flow chart to represent the procedures for the quality control of IL cement.



Quality Assurance of Interground/Blended Cement:

The Materials & Research Division has established the following flow chart to represent the procedures for the quality assurance for Interground/Blended cement.



Acceptance Policy for Pozzolans (Fly Ash or Calcined Natural Pozzolan)

This policy was removed effective 1/1/2014.

Acceptance Policy for Slag Cement for Use in Concrete

General:

These instructions cover the acceptance procedures for all slag cement used in Portland cement concrete supplied for use in Nebraska State Highway construction and maintenance.

The State of Nebraska Standard Specifications, Supplemental Specifications, and Materials Sampling Guide for Highway Construction are a part of these instructions. The slag cement shall comply with the special provisions. This requirement includes all shipments by rail, truck, or barge supplied directly to contractors through small suppliers or ready mix plants.

Certified Mill Analysis:

Slag cement producers are required to furnish the Materials & Research Division a copy of their certified mill analysis each time the slag cement produced may be shipped for use in a Nebraska Department of Transportation (NDOT) project. The certified mill analysis report shall include:

1. Name of the supplier
2. Source
3. Consignee and destination of the shipment
4. Project number if available
5. Date shipped
6. Railroad car or truck identification number
7. Weight of the shipment
8. Certified test number representing the material being shipped
9. Non-repeated order number or other identification number that will separately identify each shipment.

Approved Products List:

The slag cement on the NDOT's Approved Products List can be used when received on the project and accompanied by a supplier's certification. The requirements for approval are:

1. Twenty consecutive passing samples. Each sample will represent plant production that exceeds 100 tons per day. The five pound sample will be collected at random locations within the day's production. The slag cement shall be sampled, tested in accordance with ASTM C-989, and tested at the NDOT central laboratory. The samples shall be obtained in a manner that will represent the entire production period.
2. Approved sources must submit composite samples representing each month's production to the NDOT central laboratory. The slag cement shall be sampled and tested in accordance with ASTM C-989 (Standard Specification for Slag Cement). Each sample shall consist of at least 5 pounds of slag cement. Approved sources must submit composite samples representing each month's production to the NDOT central laboratory. The slag cement shall be sampled and tested in accordance with ASTM C-989 (Standard Specification for Slag Cement

3. If the monthly sample or any field sample is out of tolerance, the supplier shall be notified by the Pavement Cement Concrete Engineer. Shipments may not resume until the slag cement is found to be in compliance with the specifications when tested by the NDOT central laboratory.
4. If a producer requires testing more often than once per month to maintain shipments, samples may be tested at a certified commercial laboratory, at the producer's expense, and the results sent to Materials & Research Division. The test results must be received by Materials & Research Division prior to shipment of the slag cement.

Mill Sampling Procedure:

The sampling procedure requirement for the slag cement is one 5-lb sample. The sample shall be taken on the first production day of each month for the grade produced. The sample will be a composite of that day's production. Each sample will be shipped in a leak and moisture resistant container and will be identified with the location and name of the production mill, slag cement grade produced, date produced, and storage bin number. The accompanying paperwork, including the mill analysis, shall be for the sample being submitted to NDOT and will be placed in an envelope to keep documents clean.

Mill Sample Shipping:

The samples are to be shipped to the NDOT central laboratory at one of the addresses below. The producer will be responsible for the cost of shipping.

When Using the U.S Post Service:
Portland Cement Concrete Laboratory
Nebraska Department of Transportation
Materials & Research Division
P.O Box 94759
Lincoln, Nebraska 68509-4759

When using UPS:
Portland Cement Concrete Laboratory
Nebraska Department of Transportation
Materials & Research Division
1400 Nebraska Highway 2
Lincoln, Nebraska 68509-4759

Certificates of Compliance:

Certificates of compliance shall be issued by the producing plants. Copies of the certificates must accompany each load from a terminal. The forms must include the following:

1. Name and location of the producing mill
2. Consignee and destination of the shipment
3. Date shipped from the producing mill (not the date shipped from the terminal)
4. Railroad car or truck identification number
5. Grade of slag cement

6. Quantity of slag cement shipped, certified test number, date, and bin or silo number

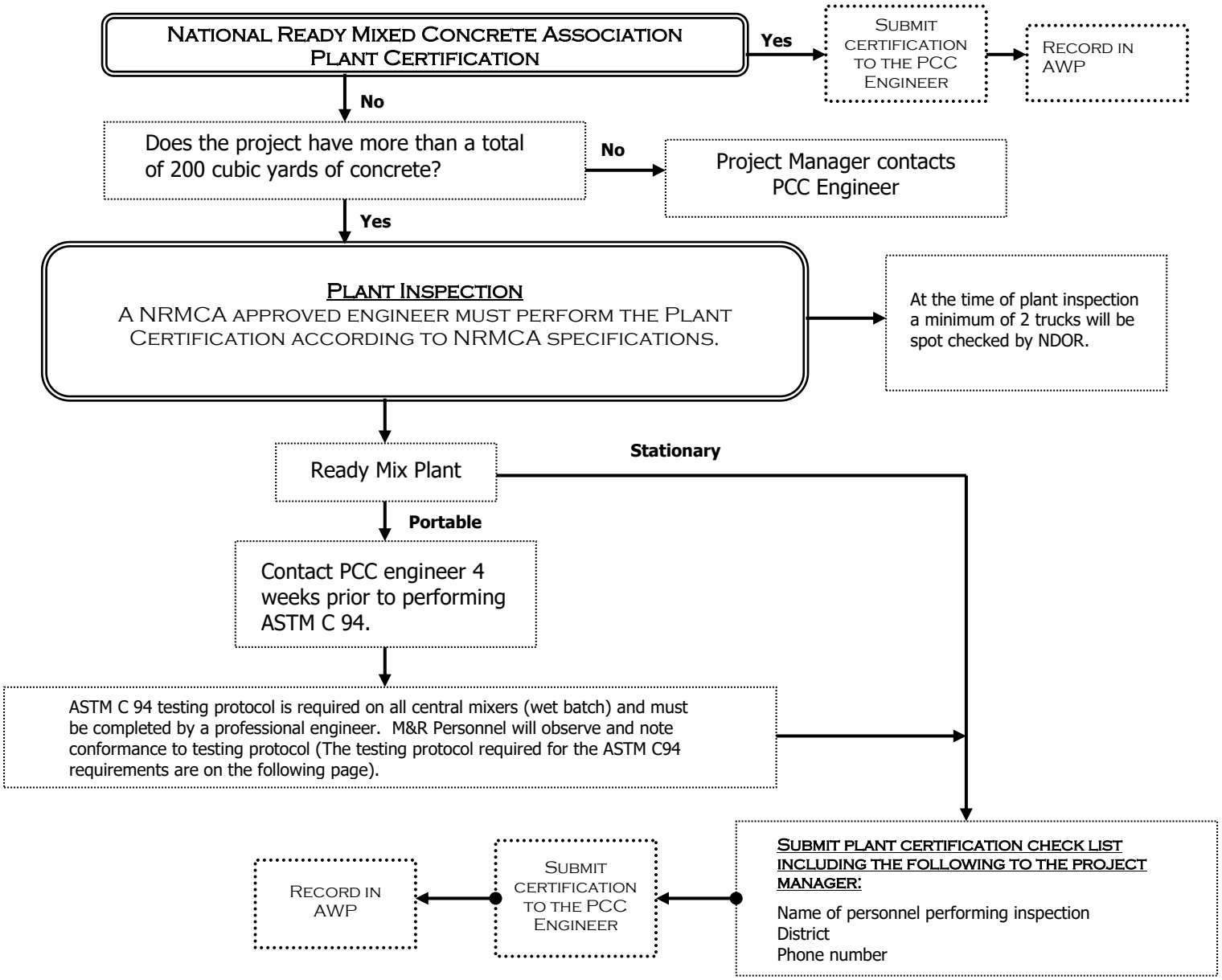
Each form for a truck shipment must include a non-repeated order number or identification number. The following signed certification statement or similar wording must also be included on the form.

> This is to certify that this shipment of slag cement was taken from the bin indicated and that it meets the specifications of the Nebraska Department of Transportation.
>
> Signed_____
> For_____

The plant or terminal will send two shipment identification and certification of compliance forms with each shipment. The concrete producer will retain one copy of the certificate of compliance for their records and one will be collected by a state inspector, if necessary.

Shipments of slag cement may be randomly sampled by NDOT personnel, as directed by the Materials and Research Division, and tested at the central laboratory in Lincoln.

Policy for Certification of Ready Mix Plants



NOTE:

1. Stationary and Portable Plants/Truck Certifications are required every two years.
    a. ASTM C 94 is required when a portable plant is relocated.
    b. During plant certification, if a plant is using washwater in the concrete mix, the washwater shall be tested. See Item 12 of this policy for required testing.

ASTM C 94 Requirements for Central Mixer Batch Plants

1. ASTM C 94 shall be performed on all portable and new stationary wet batch plants.

2. Contractor is responsible to have testing performed by ACI certified Grade I Technician.

3. Test results shall be certified and submitted to the engineer for the ASTM C 94 testing along with the plant certification check list.

4. NDOT Materials & Research will have personnel observing the testing and noting conformance to the testing protocol.

5. Testing shall be performed within the first three days of the concrete plant's production.

6. All plants shall be allowed to perform regular paving operations at minimum of 60 sec. mix time or at the plant manufacturers' recommended mixing time, whichever is greater.

7. Samples will be taken immediately after batching has been completed.

8. There shall be two samples: one at 15% and at 85% of the batch, in loaders, wheel barrows, a storage location etc. The samples must be protected to maintain the quality of the concrete.

9. Slump and air should be performed within 15 min. of each sample.

10. In accordance with ASTM C 94, Table A1.1., Requirements for Uniformity of Concrete, at a minimum, the following five tests will be performed, and four of the tests must pass for the plant to be approved at that specified mixing time.

    1. Mass per cubic foot calculated to an air free basis, (¼ cu. ft can be used)
    2. Air Content, volume % of concrete
    3. Slump
    4. Coarse aggregate content, portion by mass of each sample retained on #4 sieve, %
    5. Average compressive strength at 7 days for each sample, based on average strength of three test specimens, %

Optional: Mass per unit volume of air free mortar based on average for all comparative samples tested, % (If this is used in addition to the 5 above, a total of five of the six must pass the ASTM C 94 tolerances).

11. If a mixer performance test fails immediately and the contractor wants to continue a performance test at that particular mixing time, two consecutive tests must pass four of the five ASTM C 94 uniformity requirements.

12. Washwater Testing
    The following tests may be completed by NDOT to pre-approve washwater that is to be used in a concrete mix:

NDOT1602	Mixing Water Used in the production of Hydraulic Cement Concrete
ASTM C 1603	Measurement of Solids in water
ASTM C 31	Making and curing Concrete Test Specimens in the Field
ASTM C 109	Compressive Strength of Hydraulic Cement Mortar
ASTM C 191	Time of Setting of Hydraulic Cement by Vicat Needle
NDOT D 512	Chloride Ion in Water – Method B
NDOT T 290	Determining Water – Soluble Ion in Soil – Method A
NDOT C 114	Chemical Analysis of Hydraulic Cement- Testing (Alkalinity)

Pipe Material Policy

This policy was removed effective 1/1/2013. For more information, refer to Drainage Design and Erosion Control Manual.

Policy Concerning Concrete and Precast Pipe Plant Certification Including Testing, Inspection and Approval of Reinforced Concrete Culvert and Sewer Pipe and Concrete Flared-End Sections

General:

Concrete pipe/precast manufacturers performing work for NDOT projects must be certified by the ACPA (American Concrete Pipe Association) or the NPCA (National Precast Concrete Association). The ACPA or NPCA certified facility must submit documentation of this certification to the Nebraska Department of Transportation, Materials & Research Division on an annual basis for review. NDOT must receive a copy of any and all ACPA or NPCA audit reports, including a list of quality control personnel, certifications, noted deficiencies and corrective actions taken by the manufacturer.

In addition to the ACPA or NPCA certification, NDOT reserves the right to perform quality assurance testing, at any time, to ensure compliance with NDOT specifications. Said testing will be conducted under the supervision of the Materials & Research Division at the pipe manufacturer's plant using the department's portable testing equipment and an approved testing frame provided by the pipe manufacturer. When considered desirable by the Materials & Research Division, tests may be conducted at the department's central laboratory. Certified suppliers must agree to allow NDOT inspectors free and reasonable access to all appropriate manufacturing and processing facilities. NDOT will notify manufacturers, in writing, when deviations from specifications have occurred which may potentially jeopardize a manufacturer's certification status.

Once a concrete pipe/precast manufacturing plant has been qualified for NDOT work, it will be placed on the Nebraska Qualified Material Vendors List (NQMVL), maintained by the Materials & Research Division. This NQMVL is subject to change at the discretion of the Nebraska Department of Transportation.

Specifications and Test Methods:

The requirements of AASHTO Specification M 170-95, M 206-95 and M207-95 and the test methods designated therein will govern for reinforced concrete pipe. Requirements for the class of pipe shall be as specified by department policies, plans, and the State of Nebraska Standard Specifications for Highway Construction. Concrete flared-end sections will be required to conform to the requirements of the department's standard designs and to the applicable requirements of AASHTO Specification M 170-95, M 206-95, or M 207-95, Class II, Class A-II or Class HE-II respectively.

NDOT Assurance Testing and Reporting:

NDOT assurance testing of Class III, IV, and V pipe and flared ends will be based on the results of drilled core strength testing and/or three-edge-bearing strength tests; by conformance with the design prescribed in the specifications; and by freedom from defects as determined by visual inspection. Pipe that fails to meet the strength requirements as determined by the selected test type may not be retested in order to pass assurance testing using one of the other test options aforementioned.

NDOT will maintain records of the size, type, linear footage, or quantity of pipe and flared ends supplied for Nebraska projects. Assurance testing frequency may be based upon several factors, including the quantity of pipe shipped by the plant, ACPA or NPCA reports and past assurance test results at a particular manufacturing facility. NDOT will notify the manufacturer not less than 5 working days prior to conducting assurance testing. Test results from NDOT will be reported and kept on file by the Materials & Research Division as part of an on-going quality assurance program.

Disqualification of a Concrete Pipe/Precast Manufacturer:

DOR may disqualify a concrete pipe/precast manufacturer from supplying pipe products under the following conditions:

1) The manufacturer is no longer ACPA or NPCA certified, or
2) NDOT assurance testing has identified major production deficiencies.

Once a manufacturer is removed from the NQMVL, pipe products produced by the manufacturer will not be accepted on NDOT projects. Upon taking corrective actions to resolve the major production deficiencies, the manufacturer may ask to be put back on the NQMVL. Before reinstatement is granted, the Materials & Research Division will re-qualify the manufacturer to confirm that the production deficiencies have been resolved.

Special Designs:

Pipe designs that are not shown in AASHTO specifications (modified or special designs) will be approved on the basis of three-edge-bearing strength tests for the load to produce the 0.01 inch crack and ultimate load; by conformance with the design requirements; and by freedom from defects as determined by visual inspection. Testing of these modified or special designed pipes will be conducted by NDOT. Design computations must be submitted to NDOT for review a minimum of five working days before tests will be conducted.

Manufacturer Responsibilities:

The manufacturer must provide proper documentation including mill tests and signed shipment reports to cover all reinforced concrete pipe, concrete flared-end sections, and precast units supplied for use on Nebraska projects. Approved shipping report forms will be supplied by NDOT. Said shipping report is to be signed by the manufacturer indicating that the supplied material is in full compliance with NDOT project contract requirements and that all steel incorporated in the manufacture of the pipe or flared-ends complies with current federal Buy America requirements.

All reinforced concrete pipe and flared ends supplied by the certified plant for use on NDOT projects shall be marked by the manufacturer as required in the Nebraska Standard Specification for Highway Construction, Section 1037.02.

Pipe or flared-end sections scheduled for use on Nebraska projects may be shipped at any time by the certified manufacturing plant. However, pipe or flared-end sections that have failed assurance testing will be culled from the manufacturers stock under the supervision of an NDOT inspector. All rejected or culled pipe will be clearly marked on the section interior by the manufacturer (using permanent ink marking) stating that the pipe is ‘NOT FOR NDOT USE’.

Such rejected pipe will not be allowed for use on Nebraska projects (or any other projects under the authority of NDOT).

No section of pipe or flared ends will be allowed for shipment by the manufacturer which contains any of the defects or does not meet specification requirements as follows:

1. Fractures or cracks passing through the shell except for a single end crack that does not exceed the depth of the joint.
2. Defects that indicate imperfect proportioning, mixing, and molding.
3. Surface defects indicating a honeycombed or open texture.
4. Damaged ends where such damage would prevent making a satisfactory joint.
5. Exposed steel reinforcement (exposed ends of stirrups or spacers used to position reinforcement is not cause for rejection).
6. Pipe does not include the required manufacturer's markings as per Nebraska Standard Specifications for Highway Construction, Section 1037.02.

This policy is considered in good faith and cooperation between the Nebraska Department of Transportation and concrete pipe/precast manufacturers regarding testing, inspection, and reporting of reinforced concrete pipe products for state use. This policy, with its terms and conditions, is to be adhered to by each pipe manufacturer performing work and manufacturing products destined for State of Nebraska projects.

Policy Concerning Plastic Pipe Certification and Approval

General:

Plastic pipe manufacturers performing work for the Nebraska Department of Transportation (NDOT) must be certified by AASHTO Product Evaluation & Audit Solutions (APEAS), formerly known as the National Transportation Product Evaluation Program (NTPEP). Products not evaluated by APEAS may be reviewed for acceptance on an individual basis by the NDOT Materials & Research Division.

In addition to the APEAS certification, NDOT reserves the right to perform quality assurance testing, at any time, to ensure compliance with NDOT Specifications. Said testing shall be at the discretion of the NDOT, Materials & Research Division. Additionally, certified suppliers must agree to allow NDOT inspectors free and reasonable access to all appropriate manufacturing and processing facilities. NDOT will notify manufacturers, in writing, when deviations from specifications have occurred which may potentially jeopardize a manufacturer's certification status.

Once a pipe manufacturing plant has been qualified for NDOT work, the plant will be added to the Nebraska Qualified Material Vendors List (NQMVL), maintained by the Materials & Research Division. This NQMVL is subject to change at the discretion of the NDOT.

Specifications and Test Methods:

The requirements of AASHTO and/or ASTM Specifications shall be as outlined in the Nebraska Standard Specifications for Highway Construction, Section 1038. Materials must also comply with all applicable department policies and plans as required in the contract documents.

Disqualification of a Plastic Pipe Manufacturer:

NDOT may disqualify a pipe manufacturer from supplying pipe products under the following conditions:

1) The manufacturer is no longer APEAS certified, or
2) NDOT assurance testing has identified product deficiencies.

Any pipe manufacturer that has been removed from the NQMVL, will not be allowed to supply pipe products on NDOT projects. Upon taking corrective actions to resolve product deficiencies, the manufacturer may request in writing to become re-certified. Before reinstatement by NDOT, the Materials & Research Division will review all documents and may perform independent testing to assure that all deficiencies have been resolved.

Manufacturer Responsibilities:

The manufacturer must provide proper documentation including certificate of compliance, signed by an appropriate plant authorized representative. Said certificate is required to accompany each load of pipe delivered to an NDOT project. This documentation will be reviewed for authorization by Materials & Research personnel.

This policy is considered in good faith and cooperation between the Nebraska Department of Transportation and plastic pipe manufacturers, regarding approval of plastic pipe for state use. This policy, with its terms and conditions, is to be adhered to by each pipe manufacturer performing work and manufacturing products destined for State of Nebraska projects.