

ACCEPTANCE POLICY FOR CEMENT & BLENDED CEMENTS

GENERAL:

These instructions cover the acceptance procedures for Portland and blended cements 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. This requirement includes all shipments by rail, truck, or barge supplied directly to contractors through suppliers or ready mix plants.

CERTIFIED MILL ANALYSIS:

Portland and interground/blended cements mills are required to furnish the Materials and Research Division a copy of their certified mill analysis each time the cement produced for use in Nebraska Department of Roads (NDOR) projects. The certified mill analysis report shall include the location of the mill, brand name, type of cement, grinding period, and the results of the physical and chemical tests determined according to ASTM C-150 (Standard Specification for Cement) or C-595 (Standard Specification for Blended Hydraulic Cements).

APPROVED PRODUCTS LIST:

Portland and interground/blended cements on the NDOR's Approved Products list can be used on the project when accompanied by a manufacturer's certification. The requirements for being on the NDOR's Approved Products list approval are:

1. Twenty consecutive passing mill samples, and each sample will represent five separate grinds or blends. Each sample will be collected randomly to create a composite sample of ten pounds. The ten pound sample will be tested at the NDOR central laboratory.
 - a. Any change in the source of the pozzolan material (coal fly ash and raw or calcined natural) or Ground Granulated Blast Furnace (GGBFS), ten consecutive passing mill samples will be required.
2. The mill analysis and the NDOR test results for the twenty consecutive passing samples shall conform to one of the following:
 - a. Portland cement shall conform to ASTM C 150
 - 1) Tricalcium aluminate (C_3A) cannot exceed 8% if the cement is to qualify as a type II.
 - 2) There is no C_3A limit for type I cement.
 - b. Total cementitious material replacement shall conform to the following:
 - 1) Interground/blended cements shall conform to ASTM C 595 and ASTM C 1567 specifications with expansion less than 0.10% at 28 days. To accommodate precision within multi-laboratory testing, expansion up to and including 0.13% will be accepted for use. If the expansion is above 0.13%, the material will be rejected.
 - i. Pozzolan Class F fly ash shall be 25 ± 2 percent.
 - ii. The combination of $20\% \pm 2$ of Pozzolan Class F fly ash and $20\% \pm 2$ of Ground Granulated Blast Furnace Slag (GGBFS).
 - iii. 100% Platte River Gravel source will be used to make and test mortar bars according to the provisions of ASTM C 1567.

3. If the monthly mill sample, or any field sample, is out of tolerance, the mill will be notified by the Portland Cement Concrete Engineer. If a chemical test is out of tolerance, a check sample will be re-tested using ASTM C 114 as the referee method.
4. If tolerance problems are not corrected within 30 days following notification, the cement in question will be removed from NDOR Approved Products List.
5. With the approval of the Portland Cement Concrete Engineer, conditions for acceptance may also be met by furnishing test data from another state highway department provided the test were conducted within one year of application date.

MILL SAMPLING PROCEDURE:

The sampling procedure requirement for cements is one 10-lb sample. The 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 NDOR, and placed in a sealed envelope.

MILL SAMPLE SHIPPING:

The samples are to be shipped to the NDOR Materials & Research facility 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 Roads
Materials and Research Division
P.O Box 94759
Lincoln, Nebraska 68509-4759

WHEN USING UPS:

Portland Cement Concrete Laboratory
Nebraska Department of Roads
Materials and Research Division
1400 Nebraska Highway 2
Lincoln, Nebraska 68509-4759

CERTIFICATES OF COMPLIANCE:

Certificates of Compliance shall be issued by the producing mills. 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
Brand and type of cement
Quantity of 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 cement was taken from the bin indicated and that it meets the specification requirements of the Nebraska Department of Roads.

This certification must be signed at the mill loading site or at the terminal location. When 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 shown on the certification.

SAMPLING FROM RAILROAD CAR OR TRUCK:

Obtain samples of cement using a probe sampler (Figure 1). It shall be between 5 and 6 feet long and approximately 1 3/8 inch in outside diameter and consist of two polished brass telescopic tubes with registering slots that are opened or closed by rotation of the inner tube, the outer tube being provided with a sharp point to facilitate penetration. Take samples from well-distributed points and various depths of the cement so that the samples taken will represent the cement produced.

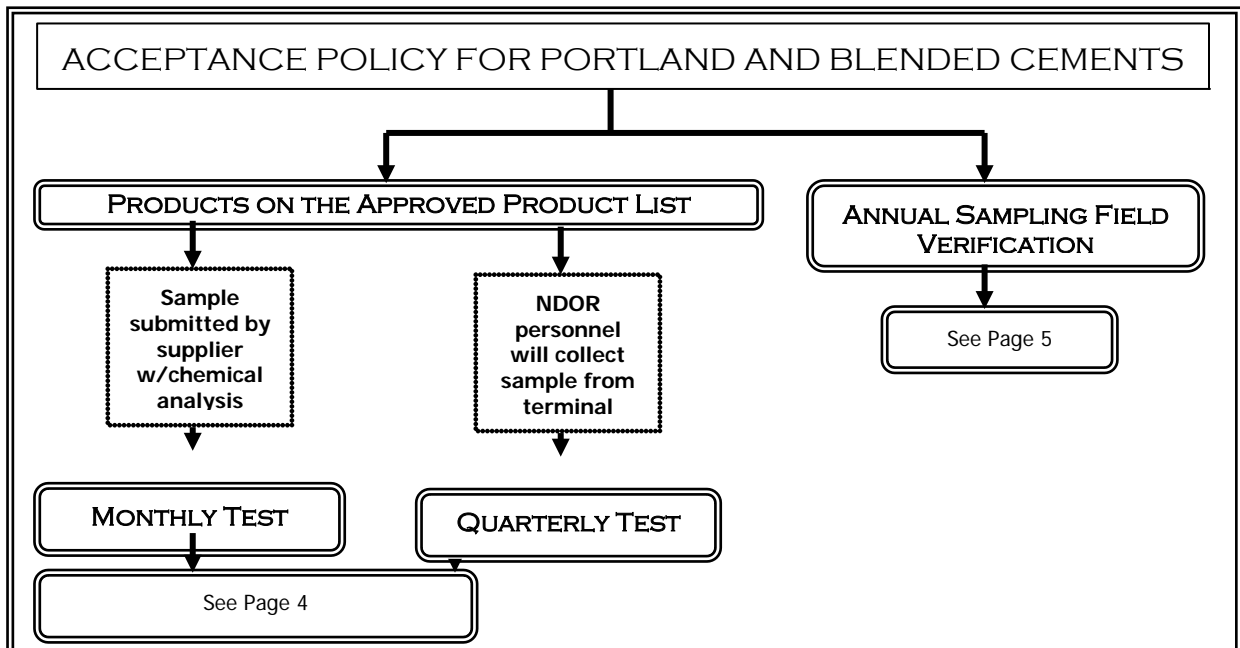


Figure1.- Probe Sampler for Bulk Cement

PROTECTION OF SAMPLES:

Place samples directly in moisture-proof airtight containers to avoid moisture absorption. A 10 pound sample could be placed in an one gallon metal container in water proof bags. After placing the material in a moisture proof container, it shall be immediately sealed.

To establish procedures for inspecting, sampling, and accepting Portland and blended cements, the Materials & Research Division has established the following flow charts to represent the procedures for the acceptance policy of Portland and blended cement.



ACCEPTANCE POLICY FOR PORTLAND AND BLENDED CEMENTS

PRODUCTS ARE ON THE APPROVED PRODUCT LIST

Sample submitted by supplier w/chemical analysis

NDOR personnel will collect sample from terminal

MONTHLY TEST
ASTM C 150
ASTM C 595
(Depending on sample)

QUARTERLY VERIFICATION

CHEM. LAB

- ASTM C114 Test Method for Chemical Analysis of Hydraulic Cement

PCC. LAB:

Physical Analysis

- ASTM C109 Test Method for compressive Strength of Hydraulic Cement Mortar
- ASTM C151 Test Method for Autoclave Expansion of Portland Cement
- ASTM C185 Test method for Air Content of Hydraulic Cement Mortar
- ASTM C191 Test method for normal Consistency of hydraulic Cement by Vicat Needle
- ASTM C204 Test method for Fineness of Hydraulic Cement by Air Permeability

If sample should fail any test procedures above, the failing test will be re-run to verify the results.

PCC. LAB:

ASTM C 1567
Alkali Silica Reaction Test
(See Page 1-Section 2.b)

- Check Chemical Analysis according to NDOR oxide ratio.
- If ratio is high, the test will be re-run to verify the results.

Expansion > 0.13%

- NDOR will notify supplier of sample failing. Supplier may elect to have independent lab confirm NDOR findings.
- NDOR will re-run ASTM C1567

OK

Not OK

Expansion ≤ 0.13%

Expansion ≤ 0.13%

Expansion > 0.13%

- Follow the **QUARTERLY VERIFICATION** Steps for check of sample.
- NDOR will notify supplier of sample failing Chem.

Not OK

Product samples failing to meet NDOR requirements will be removed from the Approved Products List (See page 1).

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OK

RECORD IN SITE MANAGER:
Chemical/Physical Analysis
Alkali Silica Reaction Test Results

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