



# **NDOR SiteManager Materials Management**

Standard Operating Procedures

Shotcrete

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**Modification Tracking Summary**

Summary of Changes	Date	Author
Standard Operating Procedures and Instructions document created	9/2/2014	Andi Clark

## 1. Introduction and Purpose:

This document is intended to be used in conjunction with the existing training materials provided by the NDOR (Nebraska Department of Roads), M&R (Materials & Research) Division.

### 1.1 Purpose:

The purpose of this document is to define the responsibilities of the inspection team during:

- Pre-placement
- Placement
- Post-placement

### 1.2 Roles and Responsibilities:

As of the publication date of this document, roles and responsibilities are defined as follows:

SiteManager Staff: 402.479.4760, [DOR.SiteManagerMaterials@nebraska.gov](mailto:DOR.SiteManagerMaterials@nebraska.gov)

Portland Cement Concrete Engineer: Wallace Heyen, 402.479-4677, [Wally.Heyen@nebraska.gov](mailto:Wally.Heyen@nebraska.gov)

Highway Project Engineer Review Analyst: Lieska Halsey, 402.479.3861, [Lieska.Halsey@nebraska.gov](mailto:Lieska.Halsey@nebraska.gov)

NDOR Portland Cement Concrete Assessment Section Manager: Tim Krason, 402.479.4709, [Tim.Krason@nebraska.gov](mailto:Tim.Krason@nebraska.gov)

### 1.3 Authentication:

Creating and Authorizing a Sample Record: <http://www.dor.state.ne.us/mat-n-tests/MMG/General/CreatingSMGRSampleRecord.pdf>

NDOR Final Review Process Manual: <S:\Final Review Manual>

NDOR Materials Sampling Guide: <http://www.dor.state.ne.us/mat-n-tests/sampguide.htm>

NDOR Standard Specifications for Highway Construction: <http://www.nebraskatransportation.org/ref-man/specbook-2007.pdf>

Sample Identification Numbering Scheme: <http://www.dor.state.ne.us/mat-n-tests/MMG/Geeneral/SampleIDNumberingScheme.pdf>

### 1.4 Abbreviations:

MSG: NDOR Materials Sampling Guide  
M&R: NDOR Materials & Research  
NDOR: Nebraska Department of Roads  
SMGR: SiteManager

### 1.5 Material Codes:

The Material Code for Shotcrete provided in this table is an integral link to the test methods. Additional information regarding the proper use of test methods can be found in Section 3 of this document.

Test Method	Material Code	Material Full Name	Last Modified User ID	Last Modified Date
PCL014001	735SHOTCRETE	Shotcrete	DOR31351	08/02/2013

## **2. Pre-Placement:**

### **2.1 Qualified Laboratories:**

NDOR testing facilities are responsible for conducting compressive strength testing for this material.

### **2.2 Material Requirements:**

Review all materials requirements for a given contract to determine the documentation procedures.

The complete list of SiteManager (SMGR) active materials is maintained online. For more information, refer to [SMGR Active Material List](#).

#### **2.2.1 Cement/Blended Cement:**

Refer to the shotcrete specification in the Special Provisions or the [NDOR Standard Specifications for Highway Construction](#).

### 3. Placement:

The construction inspection team is responsible for these activities:

#### 3.1 Specification Requirements

Review and verify plans, specifications, special provisions, and MSG for project requirements. For more information, refer to [NDOR Materials Sampling Guide](#).

#### 3.2 Material Requirements:

##### 3.2.1 Field Testing:

###### 3.2.1.1 SiteManager Sample Record:

In accordance with prescribed practices, field personnel will create a sample record in SMGR. For more information refer to [Creating and Authorizing a Sample Record](#).

###### 3.2.1.2 Test Method:

Field personnel are responsible for attaching the test template to the sample record. Choose test method PCX007001, Portland Cement Concrete Compressive Strength (2x2)

**PCC Laboratory Performed Test (2x2)**

NDOR M&R  
Wallace Heyen, Portland Cement Concrete Engineer

Template ID: PCX007001  
Version: 20140129

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**Information to be completed by field personnel**

Stationing Information: Station [ex: 222+10 to 222+30]      Offset (ft) [ex: 10']      Direction of Offset  
 +  to  +       '     

Concrete Structure:  Type\*

\*Note: For concrete structure type, please provide additional details in Comments.

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**Information to be completed by laboratory personnel**

Required Strength

Break Date	Age	Cube Size Dia x Length	Surface Area	Cube 1 Machine Load	Cube 2 Machine Load	Cube 3 Machine Load	Average Machine Load	Calculated Strength PSI
//	<input type="text"/> Days	2 x 2	4	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
//	<input type="text"/> Days	2 x 2	4	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
//	<input type="text"/> Days	2 x 2	4	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
//	<input type="text"/> Days	2 x 2	4	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
//	<input type="text"/> Days	2 x 2	4	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Note\*\* The maximum permissible range between specimens from the same mortar batch, at the same test age, is 8.7% of the average when three cubes represent a tests age; and 7.6% when two cubes represent a test age.  
If the range of the three specimens exceeds the maximum noted above, discard the result which differs the most from the average and check the range of the remaining two specimens.

Comments:

Test Specification: ASTM C 109-13

Figure 1, Template – Portland Cement Concrete Compressive Strength (2x2)

###### 3.2.1.3 Field Personnel

Field personnel are responsible to document stationing and structure information.

#### **3.2.1.4 Acceptable Sample:**

An acceptable sample consists of a minimum of two sets of three 2x2 inch cubes of Shotcrete materials. The construction technician will sample the material pursuant to accepted sampling practices.

#### **3.2.1.5 Sample Submission:**

A SMGR sample identification tag will accompany the sample to the NDOR District/Central Labs. The tag will include the sample identification number. For more information, refer to [Sample Identification Numbering Scheme](#)

Field personnel will send the sample, including sample identification tag, to the laboratory for testing.

### **3.2.2 District/Central Laboratory Testing:**

#### **3.2.2.1 SiteManager Sample Record:**

Using the sample identification number from the submitted sample, the laboratory technician will access the existing field generated sample record and enter the required strength as well as break date, age, machine load and average load.

Calculated Strength PSI is a calculated value provided to the end user. This value is not editable by the end user.

The calculation will be performed thusly: The computed expression divides the Average Machine Load by 4. The product will be rounded to the nearest integer of 10.

Once all testing is performed on the mortar cubes, laboratory personnel will complete and authorize the sample record.

## 4. Post-Placement:

### 4.1 Final Review Process:

NDOR will follow operating procedures defined in the NDOR M&R Final Review Process Manual located at [S:\NDOR M&R Final Review Manual](#).