NDOR SiteManager
Materials Management

Standard Operating Procedures

Concrete Placement

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Illustrations

Modification Tracking Summary

Summary of Changes	Date	Author
Standard Operating Procedures and Instructions document created	8-19-11	Andi Clark
Updated Roles & Responsibilities	5-23-2012	Andi Clark

1. Introduction and Purpose:

This document is intended to be used in conjunction with the existing training materials provided by NDOR (Nebraska Department of Roads), M&R (Materials & Research) Division. Questions concerning initialization of the SMGR (SiteManager) application are addressed in this existing training material.

1.1 Purpose:

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

- Pre-placement – for purposes of this document, pre-placement is defined as that period of time prior to the initial placement of concrete.
- Placement – for purposes of this document, placement is defined as the period during active construction.
- Post-placement – for purposes of this document, post placement is defined the period after active construction is completed.

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.

Portland Cement Concrete Engineer: Wallace Heyen, 402.479-4677, Wally.Heyen@nebraska.gov

Highway Project Engineer Review Analyst: Lieska Halsey, 402.479.3861, Lieska.Halsey@nebraska.gov

NDOR Aggregate Laboratory Manager: Jim Beason, 402.479.4749, James.Beason@nebraska.gov

NDOR Chemical Laboratory Manager: Jasmine Dondlinger, 402.479.4874, Jasmine.Dondlinger@nebraska.gov

NDOR Portland Cement Concrete Assessment Section Manager:

- Tim Krason, 402.479.4709, Tim.Krason@nebraska.gov

M&R Profilograph and Coring Staff:

- Jeremy Weigel, 402.479.4757, Jeremy.Weigle@nebraska.gov.
- Josh Kalin, 402.479.3864, Josh.Kalin@nebraska.gov.

NDOR QA Managers:

- District 1, Lincoln: Ron Vajgrt, 402.479.4543, Ron.Vajgrt@nebraska.gov.
- District 2, Omaha: Gary Mangen, 402.595.2534, ext 286, Gary.Mangen@nebraska.gov.
- District 3 and 8: Mike Reynolds, 402.370.3476, ext 219, Mike.Reynolds@nebraska.gov.
- District 4 and 7: Calvin Splattstoesser, 308.385.6271, ext 218, Cal.Splattstoesser@nebraska.gov.
- District 5, 6, 7 and 8: Rodney McNeel, 308-535-8111, ext 226, Rodney.McNeel@nebraska.gov.

1.3 Definitions:

Field Personnel: The certified NDOR, consultant, or LPA (Local Public Agency) field inspector(s) assigned.

Central Laboratory: Dependent on the material and agreement, this will be the NDOR central laboratory, an NDOR qualified consultant, or LPA laboratory.

Branch Laboratory: Dependent on the material and agreement, this will be the NDOR central laboratory, an NDOR qualified consultant, or LPA laboratory.

Inspection Team: The inspection team is defined as any individual employed or enjoined by the state, local project administration, and consulting firm. It is the responsibility of the inspecting agency to determine which laboratory (NDOR Central, NDOR Branch, or NDOR 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.

Responsible Charge: A representative of the LPA who is a full time public employee.

1.4 Authentication:

Class (Corresponding Aggregate Class) – Field Performed Testing ~ Coming Soon!

Standard Operating Procedures for Documentation for Concrete Acceptance Based on Maturity Curves ~ Coming Soon!

Hot Point Joint Standard Operating Procedures. ~ Coming Soon!

LPA Chapter 12 Checklists, http://www.nebraskatransportation.org/gov-aff/lpa/lpa-checklists/index.html#chap12

NDOR Approved Products List, http://www.dor.state.ne.us/mat-n-tests/aplist.htm

NDOR Final Review Process Manual, S:\Final Review Manual.

NDOR Material Management Guidance, http://www.dor.state.ne.us/mat-n-tests/matmanguidance.htm

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

NDOR Qualified Material Vendor List, http://www.dor.state.ne.us/mat-n-tests/index.htm

Ready Mix Producers List, http://www.dor.state.ne.us/mat-n-tests/pdfs-docs/gravrock2010.pdf

Rock & Gravel Producers List, http://www.dor.state.ne.us/mat-n-tests/pdfs-docs/gravrock2010.pdf

NDOR Standard Test Methods Manual, http://www.roads.nebraska.gov/mat-n-tests/NDR%20Standard%20Test%20Methods/index.pdf

Qualified Consultant Laboratories, http://www.dor.state.ne.us/mat-n-tests/pdfs-docs/qualconsullabs.pdf

SMGR Active Materials List, http://www.dor.state.ne.us/mat-n-tests/pdfs-docs/matlist.pdf

SiteManager Instructions for PCC Plant and Field Performed Tests, S:\SMG\Materials\Instructions\Concrete\Site Manager Plant & Field Inspection-Steps.pptx

Smoothness Verification Standard Operating Procedures and Instructions, http://www.nebraskatransportation.org/mat-n-tests/pdfs-docs/Materials_Management_Guidance/Asphalt/SOP_AC_and_PC_Pavement_Smoothness_Verification_Testing.pdf

1.5 Abbreviations:

ACI: American Concrete Institute
APL: Approved Products List
(d2s): Two Standard Deviations
IA: Independent Assurance

LPA: Local Public Agency
MSG: NDOR Materials Sampling Guide
M&R: NDOR Materials & Research
NDOR: Nebraska Department of Roads
PCC: Portland Cement Concrete
PM: Project Manager
QA: Quality Assurance
RC: Responsible Charge
RDL: Required Document List
RTF: Report Template Facility
SCL: SMGR Sampling Checklist
SMGR: SiteManager

2. Pre-Placement:

2.1 Inspection Team Responsibilities:

The inspection team is responsible for these activities:

2.1.1 Review Specification Requirements:

Review the NDOR Standard Specifications for Highway Construction, Informational Proposals/Special Provisions, project plans, MSG (Materials Sampling Guide), and RDL (Required Document List) for PCC (Portland Cement Concrete) requirements. For more information, refer to NDOR Materials Sampling Guide.

The RC (Responsible Charge) is responsible to review and complete the appropriate LPA Chapter 12 Construction Checklists. For more information, refer to LPA Chapter 12 Checklists.

2.1.2 Verify Portland Cement Concrete Inspector Certification Credentials:

Verify and document the technician certification requirements for the type of work performed. Notify the NDOR QA (Quality Assurance) Manager if an IA (Independent Assurance) is required. Certified personnel changes throughout the life of the project will require documentation.

2.1.2.1 PCC Field Technician Requirements:

Technicians are required to be qualified in these levels of certification:

- ACI (American Concrete Institute) PCC Field Technician Level I
- NDOR PCC Field Technician Level I

2.1.2.2 PCC Plant Inspector Requirements:

Technicians are required to be qualified in these levels of certification:

- ACI PCC Field Technician Level
- NDOR PCC Plant Inspector Level II
- NDOR Portland Cement Sampler Certification

2.1.3 Verify Non-NDOR Branch Laboratory Credentials:

The list of Nebraska qualified branch laboratories is maintained on the NDOR M&R website. See Nebraska Qualified Consultant and LPA Laboratories list. For more information, refer to Qualified Consultant Laboratories.

2.1.4 Verify Ready Mix Plant Certification Credentials:

Review the NDOR Qualified Material Vendor Ready Mix Producer List to assess the current standing of the ready mix plant(s). For more information, refer to NDOR Qualified Material Vendor Ready Mix Producer List.

- If the ready mix plant is not certified, contact the M&R PCC Engineer, prior to usage.
- If the plant certification has expired, see NDOR MSG Policy 7, Policy for Certification of Ready Mix Plants. For more information, refer to NDOR Materials Sampling Guide.

- If the plant is using wash water, refer to MSG Section 15, Mixing Water Quality. . For more information, refer to NDOR Materials Sampling Guide.

2.1.5 Material Requirements:

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

- The complete list of SMGR active materials is maintained online. For more information, refer to SMGR Active Material List.
- If a product is not on the NDOR APL (Approved Products List) and is anticipated for use on the project, contact the M&R PCC Engineer, prior to usage. For more information, refer to NDOR Approved Products List.

2.1.5.1 Cement/Blended Cement

Review MSG Policy 4, Acceptance Policy for Cement and Blended Cements. For more information, refer to NDOR Materials Sampling Guide.

2.1.5.2 Concrete Admixtures:

Review NDOR APL for acceptable admixtures. For more information, refer to NDOR Approved Products List.

2.1.5.3 White Pigmented Curing Compound (if applicable):

Review NDOR APL for acceptable curing compounds.

In accordance with the MSG, the Field Inspector will document and authorize a sample record in SMGR. For more information, refer to NDOR Materials Sampling Guide and NDOR Approved Products List.

2.1.5.4 Aggregates:

Review NDOR Nebraska Qualified Vendor Lists for acceptable aggregates. For more information, refer to Rock & Gravel Producers List.

- PCC Field Technician Requirements:
  - Identify the source of aggregate to be used on the project and sample the aggregate according to the MSG. Enter the sample information into SMGR. Refer to the MSG for sample rate for gradation and quality tests: For more information, refer to NDOR Materials Sampling Guide.
- PCC Plant Inspector Requirements:
  - The plant inspector will create a sample record in SMGR. This record shall be designated as a verification sample. A SMGR sample identification tag will accompany the sample to the NDOR Central Lab. The tag will include the sample identification number. For more information, refer to Sample Identification Numbering Scheme.
  - NDOR Central laboratory will conduct gradation verification and quality tests, and will complete and authorize the sample record. For more information, refer to SiteManager Aggregate – Field Performed Test SOP. ~ Coming Soon!

The SMGR Sample Identification Tag is represented here.


SiteManager
Sample Identification
Sample ID No.: (Fill all spaces)
Year SiteManager User # Dist. Sample #
Project No.: _____
Contract No.: _____
Project Mgr.: _____
Number of Items _____ of _____
Comments: _____
_____
_____
_____
Contact Materials & Research Division's SiteManager staff for replacement cards.

Figure 1, SiteManager Sample Identification Tag

3. Placement:

The construction inspection team is responsible for these activities:

3.1 Specification Requirements:

Review the NDOR Standard Specifications for Highway Construction, Informational Proposals/Special Provisions, project plans, MSG, and RDL for PCC requirements. For more information, refer to NDOR Materials Sampling Guide.

3.2 Verify Portland Cement Concrete Inspector Certification Credentials:

The PCC inspector(s) was verified as part of the pre placement activities. Should the PCC inspector(s) change, the inspector certification credentials will be verified.

3.3 Verify Ready Mix Plant Certification Credentials:

If the ready mix plant has changed, review the NDOR Qualified Material Vendor Ready Mix Producer List to assess the current standing of the ready mix plant(s). For more information, refer to Ready Mix Producers List.

3.4 Material Requirements:

3.4.1 Sampling and Testing Frequency:

Verify sampling and testing frequency of air tests and cylinders as required by MSG Section 15, Portland Cement Concrete for Pavement, Base Course, and Pavement Patching, and Section 16, Portland Cement Concrete for Structures, Culverts, and Miscellaneous Construction, for all concrete placement. For more information, refer to NDOR Materials Sampling Guide.

3.4.2 Documentation:

3.4.2.1 Batch Tickets:

Collect batch tickets on the project. These batch tickets will be retained in the field inspection team project file.

3.4.2.2 PCC Testing:

- If there is a single inspector that performs both the plant and field test, the tester will complete the entire proportioning report template.
- When plant and field inspection duties are divided, the plant inspector will create the sample record and the field inspector will document the results for the type of work and curing methods used.

  PCC Plant and Field Performed Test, PCX002001: Plant and field personnel will use this template as a record of concrete proportioning and structure information. For more information, refer to SiteManager Instructions for PCC Plant and Field Performed Tests.

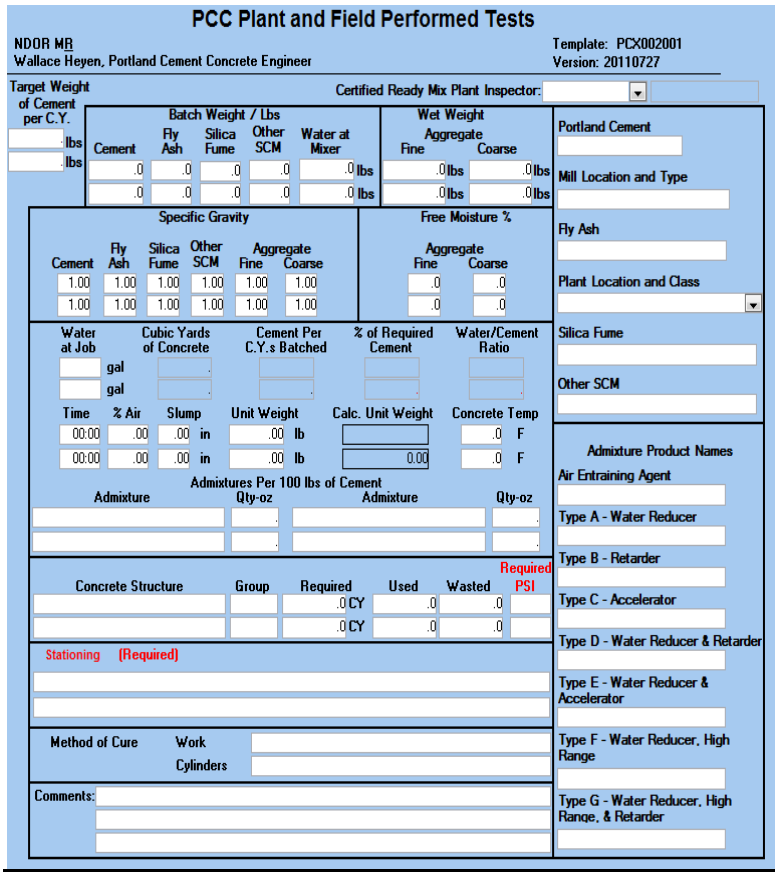


Figure 2, Template – Portland Cement Concrete Proportioning Report

Small Quantities of Non-Critical Materials – Field, MSF002001:

This will be used by field personnel for authorizing small quantities of PCC as outlined in the MSG Section 27, Note 1, Sampling and Testing Small Quantities of Noncritical Materials. For more information, refer to NDOR Materials Sampling Guide.

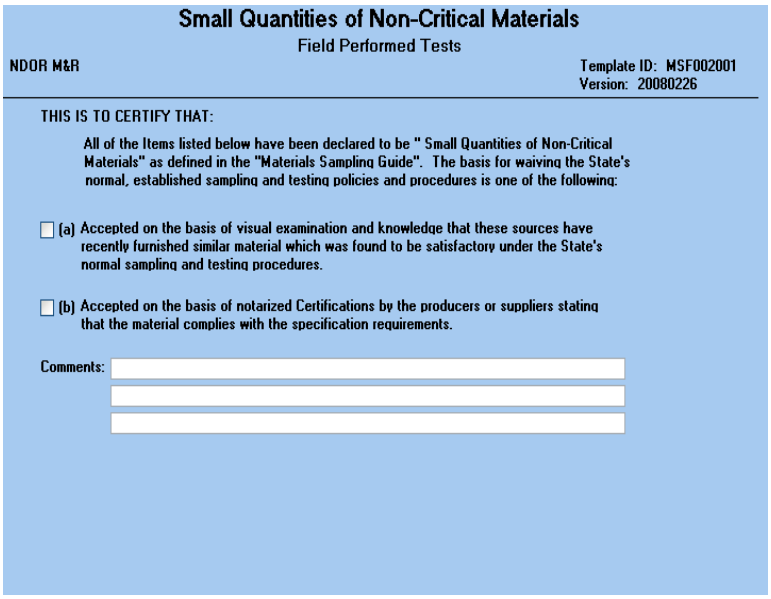


Figure 3, Template – Small Quantities of Non-Critical Materials

Portland Cement Concrete Missing in Action (MIA) Cylinders – Field, PCF001001: This will be used by the field personnel to report when cylinders are missing or damaged during construction. Field personnel will complete and authorize the sample record.

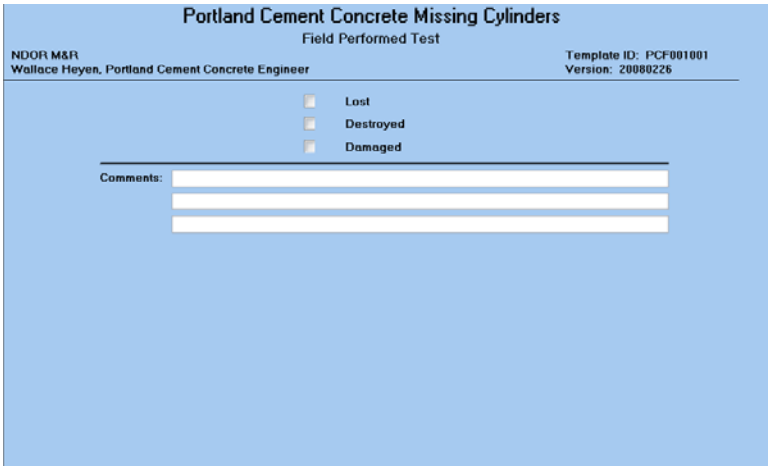


Figure 4, Template – Portland Cement Concrete Missing In Action (MIA) Cylinders

Mainline Pavement/Structure Maturity Report – Field, PCF002001:

Field personnel will create and authorize the sample record.

For more information, refer to the SOP for Documentation for Concrete Acceptance Based on Maturity Curves. ~ Coming Soon!

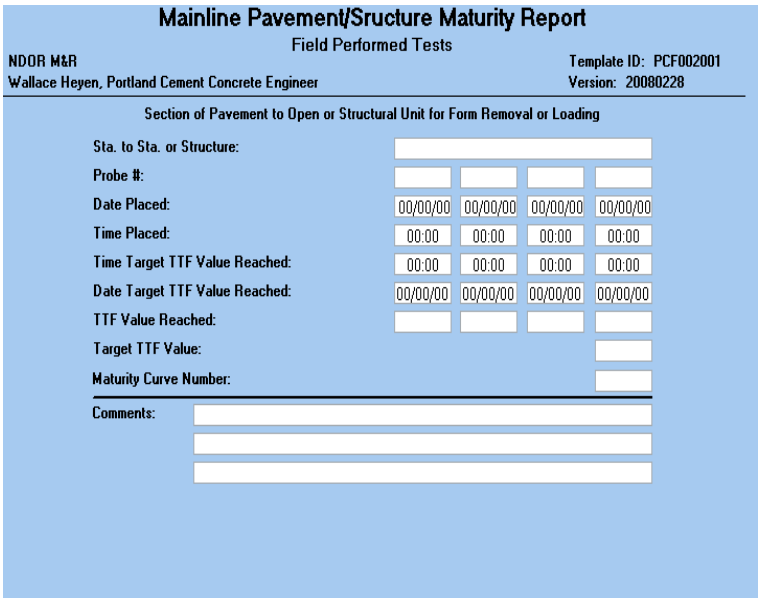


Figure 5, Template – Mainline Pavement/Structure Maturity Report

Pavement Repair Maturity Summary Report – Field, PCF003001:

Field personnel will create and authorize the sample record.

For more information, refer to SOP for Documentation for Concrete Acceptance Based on Maturity Curves. ~ Coming Soon!

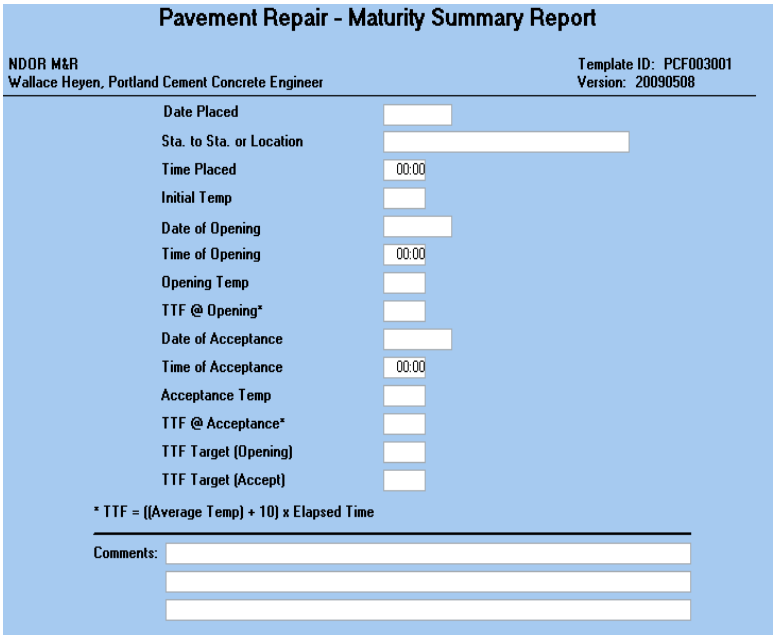


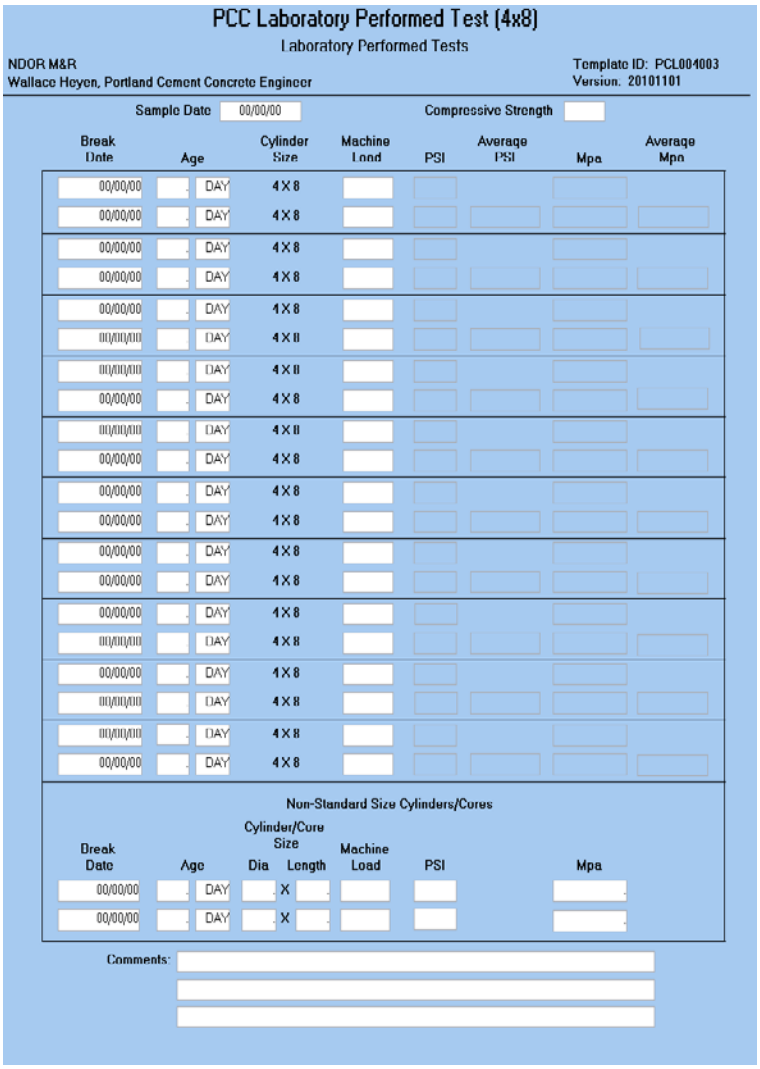
Figure 6, Template – Pavement Repair - Maturity Summary Report

PCC Laboratory Performed Tests (4x8), PCL004003 – Central Lab: Field personnel will send the sample, including sample identification tag, to the laboratory for testing.

Consultant or LPA labs responsible for conducting compressive strength testing will be prequalified by NDOR and must appear on the List of Nebraska Qualified Laboratories. For more information, refer to NDOR Materials Sampling Guide and Nebraska Qualified Laboratories.

Using the sample identification number from the submitted sample, the laboratory technician will access the existing field generated sample record and enter the sample date, minimum compressive strength requirements, break date, age and machine load.

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


PCC Laboratory Performed Test (4x8)

Laboratory Performed Tests

NDOR M&R
Wallace Heyen, Portland Cement Concrete Engineer

Template ID: PCL004003
Version: 20101101

Sample Date 00/00/00 Compressive Strength

Break Date	Age	Cylinder Size	Machine Load	PSI	Average PSI	Mpa	Average Mpa
00/00/00	DAY	4 X 8					
00/00/00	DAY	4 X 8					
00/00/00	DAY	4 X 8					
00/00/00	DAY	4 X 8					
00/00/00	DAY	4 X 8					
00/00/00	DAY	4 X 8					
00/00/00	DAY	4 X 8					
00/00/00	DAY	4 X 8					
00/00/00	DAY	4 X 8					
00/00/00	DAY	4 X 8					
00/00/00	DAY	4 X 8					
00/00/00	DAY	4 X 8					
00/00/00	DAY	4 X 8					
00/00/00	DAY	4 X 8					
00/00/00	DAY	4 X 8					
00/00/00	DAY	4 X 8					
00/00/00	DAY	4 X 8					
00/00/00	DAY	4 X 8					

Non-Standard Size Cylinders/Cores

Break Date	Age	Cylinder/Core Size Dia	Length	Machine Load	PSI	Mpa
00/00/00	DAY	X				
00/00/00	DAY	X				

Comments:

Figure 7, Template – Portland Cement Concrete Compressive Strength (4x8)

3.4.2.3 Aggregate Testing:

The field PCC plant inspector will document the test results using the SMGR test templates:

Aggregate – Field Performed Testing: These templates will be used by the field PCC plant inspector for gradation acceptance.

- C33 Fine Sand, AGF019001
- Class A (Silica Fume Fine) Aggregate, AGF001001
- Class B (47B Fine) Aggregate, AGF002001 (see Figure 8)
- Class C (AX and BX) Aggregate, AGF003001
- Class E (47B Coarse) Aggregate, AGF005001
- Class F (Silica Fume Coarse) Aggregate, AGF006001
- Coarse Aggregate for Precast – Prestressed Concrete, AGF016001
- Fine Aggregate for Precast – Prestressed Concrete, AGF013001

The field NDOR PCC plant inspector will choose one of the following four Type of Gradation Test dropdown values when completing the test template:

1. Field Acceptance
2. Re-Sample
3. Re-Test
4. Verification

For more information, refer to SiteManager Aggregate – Field Performed Test ~ Coming Soon!

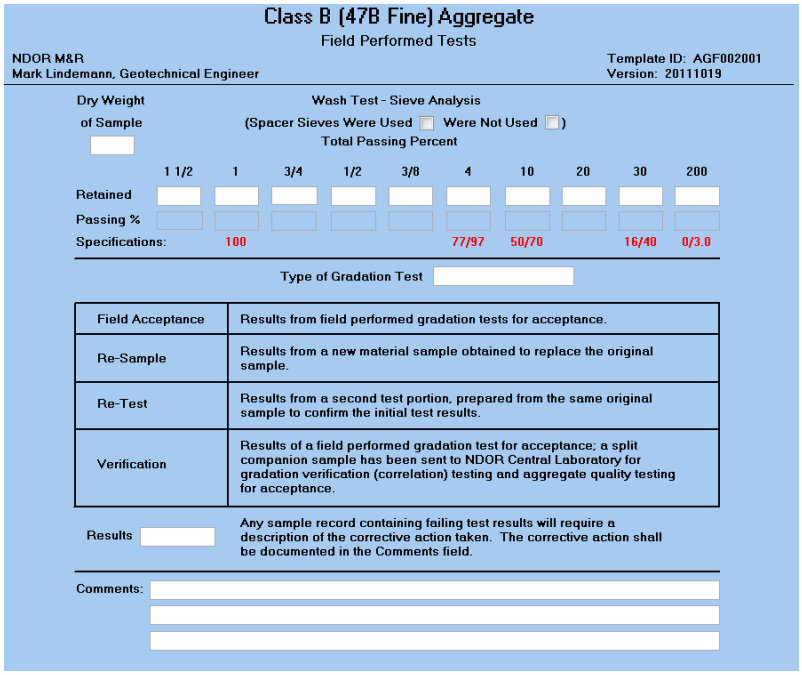


Figure 8, Template – Class B (47B Fine) Aggregate, AGF002001.

This template representation is for illustration purposes only. Each Aggregate class is captured by a unique template.

Aggregate – Laboratory Performed Testing: These templates will be used by the central laboratory for gradation verification and quality testing for acceptance.

- C33 Fine Sand, AGL019001
- Class A (Silica Fume Fine) Aggregate, AGL001001
- Class B (47B Fine) Aggregate, AGL002001 (see Figure 9)
- Class C (AX and BX) Aggregate, AGL003001
- Class E (47B Coarse) Aggregate, AGL005001
- Class F (Silica Fume Coarse) Aggregate, AGL006001
- Coarse Aggregate for Precast – Prestressed Concrete, AGL016001
- Fine Aggregate for Precast – Prestressed Concrete, AGL013001

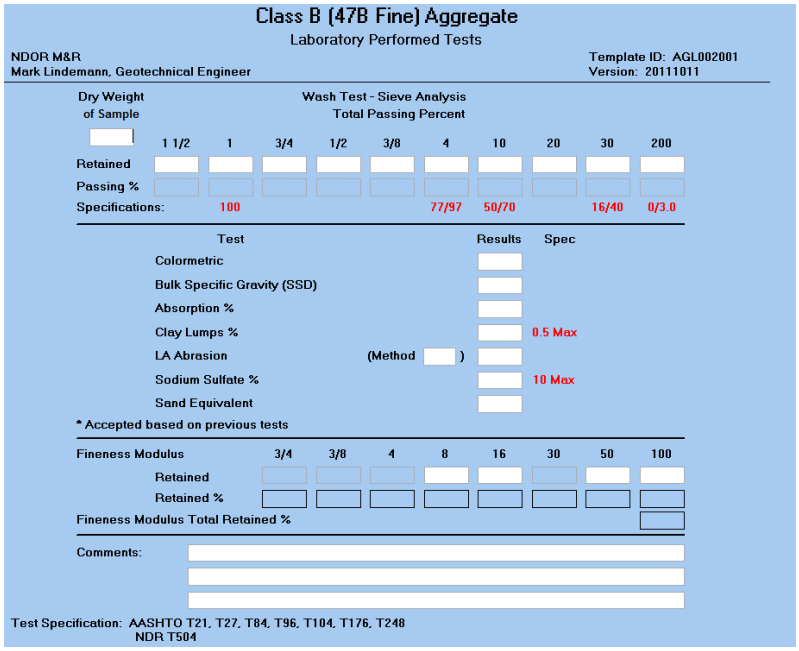


Figure 9, Template – Class B (47B Fine) Aggregate, AGL002001

This template representation is for illustration purposes only. Each Aggregate class is captured by a unique template.

3.4.2.4 Reinforcing Steel Testing:

The field inspector verifies the reinforcing steel is compliant. For more information, refer to Standard Operating Procedures for Reinforcing Steel. ~ Coming Soon!

3.4.2.5 .Hot Pour Joint Sealant and Preformed Joint Filler:

The field inspector verifies the Hot Pour Joint Sealant and Preformed Joint Filler are compliant. Review the NDOR Approved Products List. For more information, see Hot Point Joint Standard Operating Procedures. ~ Coming Soon!

3.4.2.6 Schedule Final Acceptance Coring and Smoothness Testing for Pavement:

The field inspection team will request coring and smoothness testing.

On NDOR projects, final acceptance cores and smoothness testing will be performed by the M&R Profilograph and Coring Staff.

On LPA projects, the LPA/consultant lab is responsible for final acceptance coring, while final smoothness verification testing will be performed by the M&R Profilograph and Coring Staff.

For more information on smoothness, refer to Smoothness Verification Standard Operating Procedures and Instructions.

4. Post-Placement:

4.1 Final Review Process:

The Construction Field Inspector is responsible for maintaining all original correspondence and documentation. In addition, the field inspector shall follow the NDOR Final Review Manual for project specific archiving procedures. For more information, refer to NDOR Final Review Manual.