

Policy & Procedure Document

Last Modified: 06/15/2006

Reviewed for Version:

SECTION: 1100 - Materials Management

ITEM NUMBER: 1107.8

ITEM: PORTLAND CEMENT CONCRETE MIX DESIGN

REVISED: 06/15/2006

IMPORTANT NOTE - PLEASE READ

On April 7, 2006, the following e-mail was sent to all SM users in RESLABMN security group. This e-mail supersedes all previous training instruction and policies:

This email is being sent to the SM users with update access rights to the PCC mix design windows:

Some problems have been discovered in the PCC mix design windows. While we have always been aware that the concrete mix design area of SM had limitations, the extent of the problem did not become apparent until multiple users began inputting mix designs. To prevent future problems related to new mix designs being entered into the tables, we are removing update rights to the concrete mix design windows. During training, you were instructed how to create concrete mix designs and associate them to contracts. In addition, all users were instructed how to associate a concrete sample to the proper mix design on the second folder tab of a sample information record.

Please be aware of the following changes:

Users will not be able to create new PCC mix designs in the mix design windows. (This will make your life a lot easier)

For PC concrete sample records, users will not choose a PCC mix design on the second tab (Addtl Sample Data) of a sample record. (In Residencies where mix designs have already been created, inform all of your personnel to NOT choose the mix design on the Addtl Sample data tab.)

For PCC mix designs already in SM, do not associate them to any more contracts.

For PC concrete sample records, users may document the mix design used on the fourth tab (Other Tab) by selecting Mix Design ID from the dropdown box and entering a mix identification number. (Many concrete suppliers show a mix design number on their batch tickets)

You will continue to review and (approve?) concrete mix designs in your offices using existing non-sitemanager processes.

It is our intention to develop a solution whereby a list of standard mix designs can be input into SM, and made available for users to properly and easily document mix design usage on sample records and contracts. You will be notified when this solution becomes available.

It is essential that you pass this information along to anyone who may be creating concrete sample records in SM.

I regret any confusion this may cause. I want to thank the lab managers who jumped into SM, discovered the problems, and brought them to our attention before it became a big problem.

END OF EMAIL

DISREGARD THE FOLLOWING POLICY UNTIL FURTHER NOTICE:

SCOPE:

To establish the policy and procedure for maintaining the SiteManager Portland Cement Concrete Mix Design information.

GENERAL:

The Portland Cement Concrete (PCC) Mix Design Window allows for the addition, modification and approval of PCC Mix Designs. When a mix design is approved, the mix design ID becomes available for pick list selection and listing on Contracts in the Contract Mixes area, and in the Sample Information area when the PCC Design type is selected on the additional sample folder tab .

In OkDOT, the Contractor submits a proposed PCC mix design to the Resident Engineer for review, to determine compliance with specified design criteria. SiteManager's approval functionality will be used to indicate a mix design meets design criteria specifications, uses approved sources, and is acceptable for use. The mix design approval process will be documented in SiteManager by completing the appropriate windows defined in this policy.

It is not possible to change a mix design once it is approved. Data will be entered in this window by the Residency Lab Manager. Only the Resident Engineer or his/her designated representative may approve a mix design. The Resident Engineer or his/her designated representative should be notified by the Residency Lab Manager when data entry is complete and the mix design is complete and ready for approval or Contract listing.

To approve a mix design in this window, go to the Description folder tab, click Services from the top bar menu and then select the Approve option.

SiteManager Access Assignments				
Central Office				
Group Code	Group Name	Update	Inquiry	None
CENADMIN	Administration			X
FHWA	Federal Highway Administration			X
CENINQRY	Inquiry			X
REGSERV	Regulatory Services			X
SYSADMIN	System Administration	X		
Construction Division				
Group Code	Group Name	Update	Inquiry	None
CONSADMN	Administration		X	
CONEST	Records Administration A			X
CONSLOAD	Records Administration B			X
Field Division				
Group Code	Group Name	Update	Inquiry	None
DIVADMIN	Administration		X	
DIVAUDIT	Auditors		X	
DIVINQRY	Inquiry		X	
Materials Division				
Group Code	Group Name	Update	Inquiry	None
MATADMIN	Administration	X		
MATAUTH	Branch Managers		X	
MATIAS	Independent Assurance		X	
MATINQRY	Inquiry		X	
MATSTA	Lab Supervisors		X	
MATTEST	Recording Samples / Tests		X	
MATTRAIN	Training Updates			X
Residency				
Group Code	Group Name	Update	Inquiry	None
RESADMIN	Administration	X		
RESAUDIT	Auditors		X	
COUNTPRT	C.O. Approvals for Contractors			X
RESINQRY	Inquiry			X
RESLABMN	Lab Managers	X		
RESLABTC	Lab Technicians		X	
RESINSP	Project Inspectors		X	
RESPRMAN	Project Managers		X	
RESSCTRY	Secretaries / Clerks		X	

Description Folder Tab

The Description folder tab of the Portland Cement Concrete Mix Design window is used to capture some of the basic mix design information. It contains the following fields:

Mix ID

Mix ID is a data entry field that allows for the entry of up to 15 characters. In OkDOT, the format for all Portland Cement Concrete Mix Design Mix ID's will be as follows:

TT PPPPPYYSSS where

TT is a numeric code for the Concrete Class Type (see Concrete Class Type below)

PPPPPP is the SiteManager Producer/Supplier (P/S) code for the company furnishing the mix (See

Producer Supplier Code below)

YY is the year the mix was initially designed

SSS is a sequence number for the TT Class by the P/PP/S in YY year, beginning with 001

Example: 02m0046104005 would be an ID for a Class AA(AE) mix furnished by Dolese Concrete, initially designed in 2004, and being the 5th Class AA(AE) for them in 2004 entered into the system.

Material Code

Material Code is a look up field that lists all materials available in Material Detail. Users should select the appropriate material code for the general class of concrete. In OkDOT, all portland cement concrete material codes begin with a **pcco** prefix. Additionally, all of the material codes with a pcco prefix will be in the Material Category 701 PC Concrete. The material codes and descriptions designate the general class of concrete. Example: pcco001 code has a description of HC Conc Class AA(AE). Selecting the material code automatically displays the material description in an adjacent field.

Producer Supplier Code

In this field, select the Producer / Supplier that submitted the mix design.

This is a look up field that lists all Producer / Suppliers in SiteManager's Producer / Supplier list. This list is not filtered according to the selected Material Code. Users should select the appropriate Producer / Supplier for the portland cement concrete mix. To assist in determining which Producer / Supplier to select - reference the Producer Supplier Type field in the pick list. Producer / Suppliers of Portland Cement Concrete should have a code of PCC in that Producer Supplier Type column. Users may select the appropriate Producer / Supplier here first to know what the 3rd thru 7th digits in the Mix ID should be.

As part of the mix design documentation process, for materials such as concrete, the data entry and approval process shall include verification that submitted sources are approved to supply the material.

This field is not a filtered list and Resident Engineers should be aware of the potential gravity of their approving unlisted material to Producer / Supplier associations.

Designer Name

This is a data entry field that allows for the entry of up to 50 characters. If the name of the person who designed the mix is known, enter it here. If the mix design carries another mix design ID (non-SiteManager), enter that mix design ID here as well.

Concrete Class Type

Concrete Class Type is a look up field that lists data from a system table named PCCCLASS. This field will be used to classify the class type to a higher degree than contained in the material code/description. Currently, the available options are:

- 01 - Class A(AE)
- 02 - Class AA(AE)
- 03 - Class AP or B(AE)
- 04 - Class C(AE)
- 05 - Class P(AE)

- 06 - Class A High Early Str - AHE(AE)
- 07 - Class AA High Early Str - AAHE(AE)
- 08 - High Density - HI-DEN
- 09 - Cont Low Strngth Material - CLSM
- 10 - Latex Modified Concrete - LMC
- 11 - Fiber Mesh Class A - FMA(AE)

The first 2 numeric digits are Class Type identifiers, to be used as the first 2 digits in relative Mix ID's. Users may select the appropriate Concrete Class Type here first to know what the first 2 digits in the Mix ID should be.

Effective Date

Effective Date is a data entry (date) field and will be used to document the date the SiteManager mix design data record became effective.

Termination Date

Termination Date is a data entry (date) field and will be used to document the date the SiteManager mix design data record is terminated. Mix designs are to be terminated when mixtures using the design are consistently not meeting the design standards. Users making mix design to Contract associations and mix design to Sample Information Record associations are to review this data to assure new associations are not made to terminated designs.

Approved Date

Approved By User ID

Approved Date and Approved By User ID are automatically populated by the system when a mix design is approved. To approved a mix design, select the Services, then Approve option. A Portland Cement Concrete Mix Design may not be changed once it is approved.

Properties Folder Tab

The Properties folder tab of the Portland Cement Concrete Mix Design window does not function as expected for most of the fields. Only a few fields will be used to capture certain mix design properties. When custom mix design test templates are created, they may be created and utilized in a manner so that the system automatically validates entered test values against these mix design property values. Another option that may be used to capture mix design properties will be to attach a spreadsheet to a sample record that is referenced in the Materials Folder Tab area. The Properties Folder Tab contains the following fields:

Min Average Strength Required

Will not be used.

Design Strength Specified

Will not be used.

Theoretical Unit Wt

Theoretical Unit Wt is a data entry (numeric) field and will be used to document that value expressed in pounds (lbs). To the right of this field is a drop down list to document the unit for the listed value. Select the **pounds per cubic foot** unit here.

Water Cement Ratio

Water Cement Ratio is a data entry (numeric) field and will be used to document that value as a decimal value. The value should be supplied in the proposed mix design as required in the specifications.

Unit Weight Measured

This field will not be used.

Air Content Measure

This field will not be used.

Slump Measured

This field will not be used.

MATERIALS FOLDER TAB

The Materials folder tab of the Portland Cement Concrete Mix Design window is used to capture material data specific to the component materials used in the mix. The information documented in this area is supplied by the Contractor in their mix design proposal, and is not always provided. The three critical fields to complete are; material code, Brand name (when appropriate) and the Producer / Supplier (source of the materials). Multiple materials will be listed by clicking the new icon and adding. It contains the following fields:

Material Code

Material Code is a look up field that lists all materials available in Material Detail. Users should add each material code which reflects a specific component part of the mix, then add the additional data relative to that selected material. Selecting the material code automatically displays the material description. Some common materials to be selected will be as follows:

Typical Material Code Prefix	Common Material Code	Common Material Full Name	Common Material Category
admx	admx001	HC Conc Air Entraining Agent	701 PC Concrete
admx	admx002	HC Conc Chemical Admixture	701 PC Concrete
aggr	aggr057	HC Conc Aggregate No 57, Coarse	701 PC Concrete
aggr	aggr056	HC Conc Aggregate No 67, Coarse	701 PC Concrete
aggr	aggr054	HC Conc Aggregate, Fine	701 PC Concrete
fibe	fibe001	HC Conc Fiber Reinforcement	701 PC Concrete
flya	flya002	Fly Ash, Class C	702 Recycled Modifiers
h2o	h2o001	Water	701 PC Concrete
port	port001	HC Conc Cement Type I	701 PC Concrete

Additional materials will be required and should be available in Material Detail for selection. The above list is shown to relay certain common materials and assist in searching through the pick list for other materials that would be appropriate to select. Similar materials will have the same Material Code Prefix, follow the same Material Full Name convention, and be listed in the same Common Material Category. Clicking on any column heading in the pick list sorts that column alphabetically.

Brand Name

Brand Name is a data entry (42 character text) field and will be used to document Product Names in the same manner that they appear on the Approved Materials List. As part of the mix design documentation process, for materials such as admixtures, the data entry and approval process should check that submitted Brand (Product) Names are listed in SiteManager Approved Materials List as defined in 1105.1 Approved Materials.

This field is not a look up list and Resident Engineers approving SiteManager mix designs should be aware of the potential gravity of their approving unlisted Brand (Product) Names.

For water, rather than list every city as a Producer / Supplier of water in SiteManager, the Brand Name field for the water Material Code should be the name of the city. If water is not from a city but a doubtful, tested source, a brief description of that source should be listed in Brand Name as well.

Producer Supplier Code

Producer Supplier Code is a look up field that lists all Producer / Suppliers in SiteManager's Producer / Supplier list. Users should select the appropriate Producer / Supplier for the selected Material Code.

As part of the mix design documentation process, for materials such as aggregates, cements and cement substitutes, the data entry and approval process shall include verification that submitted sources are approved listed to supply the materials.

This field is not a filtered list and Resident Engineers who approve SiteManager mix designs should be aware of the potential gravity of their approving Producer / Suppliers that are not approved listed to supply the materials.

For water, always select P/S code Contractor and make sure Brand Name is populated as described above.

Sample ID

Sample ID is a look up field, filtered by the selected Material Code. It lists all SiteManager Sample Information records that have been created for the selected Material Code. The Sample Information record process is described in 1109.1 Sample Information. Users should select and display any Sample Information record that serves as justification for the entered data. Typically there will be no association made here unless specific OkDOT tests were conducted for the sole purpose of determining what value(s) to enter in the data entry fields below.

Spfc Gravity

This is a data entry field and will be used to enter the numeric value of the Specific Gravity of the following listed component materials:

- coarse aggregates
- fine aggregates
- hydraulic cements
- hydraulic cement substitutes

Bulk Spcfc Gravity

This is a data entry field and will be left blank.

SSD Weight

This is a data entry field and will be left blank.

Absorption Percent

This is a data entry field and will be used to enter the numeric value of the absorption percent for the following listed component materials:

coarse aggregates

fine aggregates

Fineness Modulus

This is a data entry field and will be used to enter the numeric value of the fineness modulus (FM) for the following listed component materials:

fine aggregates

Mass

Mass is a data entry field and will be used to enter the numeric quantity of the component material in 1(one) Cubic Yard of the Mix. Since a mix design may be used on either an English or Metric project, for the sake of uniformity, all Mass quantities should be English and always based on 1(one) Cubic Yard of the Mix.

Units Type

This field is to the right of the Mass field is a drop down list to document the unit for the numeric quantity listed in the Mass field. Since a mix design may be used on either an English or Metric project, and for the sake of uniformity, all component materials other than admixtures should contain **lbs** in this field. For admixtures, **oz** should be in this field.

Gradations Folder Tab

The Gradations folder tab of the Portland Cement Concrete Mix Design window is available to capture combined gradation data relative to the mix. It lists gradations specific to the Material Code listed on the Description tab. That Material Code is one for the concrete mixture.

In OkDOT, gradations are relative to, and separately listed under, individual fine and coarse aggregate Material Codes. OkDOT, at this time, has no specified combined gradations relative to, or listed under, the concrete mixture Material Codes.

The Gradations Folder Tab will not be used at this time, but is being maintained available because the "Optimized Mix Design" concept may replace our specified separate gradation methods in the future.