

# Policy & Procedure Document

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Reviewed for Version:

**SECTION:** 1100 - Materials Management

**ITEM NUMBER:** 1107.6

**ITEM:** SUPERPAVE MIX DESIGN

**REVISED:** 01/31/2012

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## SCOPE:

To establish the policy and procedure for maintaining the SiteManager Superpave Mix Design information.

## GENERAL:

The Superpave Mix Design Window allows for the addition, modification and approval of Superpave Mix Designs. Although the window is named Superpave Mix Design, OkDOT will use this window to document other bituminous (asphalt) mix designs whenever possible. 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 Superpave Design type is selected on the additional sample folder tab.

UltraThin Bonded Wearing Course (UTBWC) Mix Designs will also be documented using this window. UTBWC designs are not technically a SuperPave design and therefore the input procedure will vary slightly from the procedures given below. The differences are described in a QRG, "UTBWC Mix Designs".

**Information and data entered in this window and in the mix design template C93001 is referenced in Superpave test templates, and printed in the Department's Mix Design Reporting tool. It is critical that the instructions detailed in this policy be followed explicitly. Failure to follow these policies and procedures will result in major loss of functionality in other templates, and in the reporting and analysis tools.**

In OkDOT, the Contractor submits a proposed bituminous mix design to the Materials 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 and templates defined in this policy.

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

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 Superpave 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 Mix ID's of all bituminous mix designs in this Superpave Mix Design window will be as follows:

**TTLLLLLYSSSCR** or **TTLLLLLYSSSCR** where

TT or TTT is an alphanumeric code for the Mixture Class (see Bituminous Mixture Class table below and footnote about TTT)

LLLLL is the SiteManager Qualified Lab ID for the lab designing the mix (ref: 1105.8 Qualified Labs)

YY is the year the mix was initially designed

SSS is a sequence number for TT class designs by lab LLLL in YY year, beginning with 001

C is a sequence correction number beginning with 0 for the initial entry  
R is a sequence revision number beginning with 0 for the initial entry

Example: S2pv0150400901 would be an ID for an S2 Superpave mix designed by Engineering Services & Testing, Tulsa initially designed in 2004, being the 9th S2 Superpave mix designed by them in 2004, containing 0 correction information and number 1 revision information.

<b>Mixture Class Codes (TT) or (TTT)*</b>	
S2	Superpave Type "S2" (1" Nominal Maximum Size)
S3	Superpave Type "S3" (3/4" NMS)
S4	Superpave Type "S4" (1/2" NMS)
S5	Superpave Type "S5" (3/8" NMS)
S6	Superpave Type "S6" (No. 4 NMS)
M2	SMA - 1/2" NMS
M1	SMA - 3/4" NMS (No current specification for this mix)
M3	SMA - 3/8" NMS (No current specification for this mix)
P1	PFC - 1/2" NMS
RB	RBL - 1/2" NMS
RI	RIL - Rich Intermediate Layer
U1	Ultra Thin Bonded Wearing Course (UTBWC) - Type A
U2	Ultra Thin Bonded Wearing Course (UTBWC) - Type B
U3	Ultra Thin Bonded Wearing Course (UTBWC) - Type C
OB	Open Graded Bituminous Base (OGBB)
OS	Open Graded Friction Surface Course (OGFSC)
T1	Micro Surfacing (Type I Aggregate)
T2	Micro Surfacing (Type II Aggregate)
T3	Micro Surfacing (Type III Aggregate)
C1	Hot Mix - Cold Lay Type "HC1" (1" NMS)
C2	Hot Mix - Cold Lay Type "HC2" (1/2" NMS)
C3	Hot Mix - Cold Lay Type "HC3" (3/8" NMS)
C4	Hot Mix - Cold Lay Type "HC4" (No. 4 NMS)

\* When Warm Mix Asphalt (WMA) technology is used, all TT code listings above will be preceded by a "W" to form TTT. Example: WS2pv0150400901

### 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 bituminous mixture. In OkDOT, all bituminous mixture material codes begin with a **asco** prefix. The material codes and descriptions designate the general class of bituminous mixture. Example: asco008 code has a description of Asphalt Concrete, Type S3 (PG-70-28 OK). Selecting the material code automatically displays the material description in an adjacent field.

### Producer Supplier Code

In this field, select the Producer / Supplier that will produce the mix. Most generally, they are the ones 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 bituminous mixture. To assist in determining which Producer / Supplier to select - reference the Producer Supplier Type field in the pick list. Producer / Suppliers of bituminous mixtures will typically have a code of ASPH in that Producer Supplier Type column.

As part of the mix design documentation process, 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 the Bituminous Engineer should be aware of the potential gravity of 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 Qualified Lab submitting the mix design has its own name or number for the mix design, enter it here. Otherwise, this field will be left blank. **Comment: There is ongoing effort to train and certify individuals to design these mixes and use a standardized spreadsheet. When that goes into effect, this field will be used for the name of the certified individual designing the mix, selectable on the spreadsheet by the current and valid certification listing in SiteManager.**

**DSC 2/13/2008**

### AC Type

This is a drop list field that lists data from a system table named ASPHCEM. Select the appropriate AC Type for the record. Current options are:

PG-64-22 OK  
PG-70-28 OK  
PG-76-28 OK

### Mix Type

This is a drop list field that lists data from a system table named MIXDSN. This field will be used to further classify the mixture. Currently, the available options are:

Binder  
Binder - Recycled  
Insoluble  
Insoluble - Recycled

### 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 shall 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 Superpave Mix Design may not be changed once it is approved.

## Properties Folder Tab

The Properties folder tab of the Superpave Mix Design window will not be used by OkDOT to capture data. Do not enter any data in this window. Reference the remainder of sections in conjunction with the **Required Sample Information Record** below for guidelines on how and where to capture the required mix design properties data.

## Materials Folder Tab

The Materials folder tab of the Superpave Mix Design window is used to capture material data specific to the component materials used in the mix as well as other details. 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 or as otherwise required, then add the additional data relative to that listed material. Selecting the material code automatically displays the material description. Some common materials to be listed will be as follows:

<b>Typical Material Code Prefix</b>	<b>Common Material Code</b>	<b>Common Material Full Name</b>	<b>Common Material Category</b>
acem	acem002	Asphalt Cement Type PG 70-28 OK	708 Bitum. Bases & Surfaces
addi	addi003	Asphalt Additive, Anti-Strip	708 Bitum. Bases & Surfaces
aggr	<sup>1</sup> aggr066	<sup>1</sup> Asphalt Concrete Aggregate 01	708 Bitum. Bases & Surfaces
asco	<sup>2</sup> asco008	<sup>2</sup> Asphalt Concrete, Type S3 (PG 70-28 OK)	708 Bitum. Bases & Surfaces

1. Material Codes aggr066 thru aggr075 with descriptions Asphalt Concrete Aggregate 01 thru 10 are reserved for individual component aggregates used in mixes. List each component aggregate material. **Always begin with aggr066 (01) and use a consecutive series to document each individual component aggregate in the mix.** Example: If there were 4 individual component aggregates used, list aggr066 (01) first, then aggr067 (02), then aggr068 (03) and finally aggr069 (04).

2. **Always select and list the identical material for the mix itself.** This is to be the identical code/material that appears on the Description tab of the Superpave Mix Design window. This is required in order to capture and link additional design information relative to the mixture.

Additional materials will be required and should be available in Material Detail for selection. The above list illustrates common and required materials, and could 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 than column alphabetically.

## Producer Supplier Code

Producer Supplier Code is a look up field that lists all Producer / Suppliers in SiteManager's Producer / Supplier list. Users shall select the appropriate Producer / Supplier for the selected Material Code. For aggregate materials such as sand that the source is of no particular importance, users should select and list:

Producer Supplier Code: **Contractor**      Producer Supplier Name: **Contractor / Project Site**

As part of the mix design documentation process, for materials that should only come from approved sources, such as coarse aggregates, asphalt cements and additives, the data entry and approval process shall verify submitted sources are approved listed to supply the materials.

This field is not a filtered list and Users 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.

## Brand Name

Brand Name is a data entry (42 character text) field and will be used to document:

**A.** Product Names in the same manner that they appear on the Approved Materials List. The listing for approved Asphalt Binders are located under material code qual009 of the Approved Materials List. Enter the product name exactly as it appears in the Approved Materials List.

*Example, enter **PG 76-28 OK (P/S m00510)** for a PG 76-28 binder supplied by Frontier CIC (Muskogee, OK).*

As part of the mix design documentation process, for materials such as asphalt binders and additives, the data entry and approval process must check that submitted Brand (Product) Names are listed in SiteManager Approved Materials List as defined in 1105.1 Approved Materials and

**B.** Definitive, specialized names for aggregates such as #57 Rock, Stone Sand, Screenings, R.A.P., chat, etc.

For the material code entry listing the asphalt mixture (S3, S4, etc.), enter, "Sample Information Record", for the Brand Name.

This field is not a look up list and the Bituminous Engineer approving SiteManager mix designs should be aware of the potential gravity of their approving unlisted Brand (Product) Names or unapproved aggregates / sources combinations.

## Blend Percent

Blend Percent is a data entry field and will be used ONLY to document the percent of each individual component aggregate in the combined aggregate for the mixture. Other percentages will be captured elsewhere. Do not list any percentages here for AC listings, combined aggregate listings or listings for the mix itself.

## 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. Typically there will only be one association made here, and it is a mandatory association. **Always associate the listing for the mix material itself to the Sample Information Record created to capture the additional required design information.** See Required Sample Information Record section below for more information.

### Specific Gravity (Apparent)

Do not enter any data into this field.

### Specific Gravity (Bulk)

Do not enter any data into this field.

## **Gradations Folder Tab**

The Gradations folder tab of the Superpave Mix Design window will be used to capture the Job Mix Formula (JMF - gradation and AC Content) data relative to the mix design. It works in conjunction with broad range gradation parameters specified for the mix material (the Material Code listed on the Description tab).

**Procedure:** Click into the Effective Date / Status panel and then click the New icon. Select the appropriate Effective Date for the broad range gradation data. The Sieve Size, Minimum Range and Maximum Range for the selection will appear in the lower panel.

In the white fields of the lower panel, enter the JMF in the Sieve Values column. In the Min & Max Production Tolerances columns, enter the allowable percentage passing values based on the allowable range of tolerances from JMF for each sieve size. Note that AC Content % is on the list at the bottom of the sieves and requires data entries here as well.

When a value is entered into Sieve Value that is outside specified parameters, an \* (asterisk) will appear in the \* (asterisk) column.

### **Required Sample Information Record**

This section of the policy describes the OkDOT method for capturing additional data deemed necessary to report on an asphalt mix design report. The additional data from the Sample Information Record and tests, in conjunction with data captured in the mix design window itself will be combined on a custom report facility available in Accessories / System Attachments in a report: MAT11076A - Asphalt Mix Design Detail Report. Reference [MAT11076A - Asphalt Mix Design Detail Report](#) section below for additional details on the custom report. For System Attachments in general, reference 306.0 System Attachments

For the custom report facility to function properly, certain data must be entered in a precise manner on the required Sample Information Record. Following the general guidelines of 1109.1 Sample Information, create a Sample Information Record with special attention to the following:

### **Basic Sample Data Tab**

**Material** - Select the identical code/material selected on The Description folder tab of the Superpave Mix Design window.

(although it is not a key component of the report facility, the same Producer / Supplier should be selected as well)

**Smpl Type** - Select "Document"

**Acpt Meth** - Select "Materials Division"

**Smpld by** - Select the Materials Division employee creating the sample record.

**Intd Use** - Enter the SiteManager Superpave Mix ID.

**Status** - The person responsible for reviewing and authorizing this sample record shall verify the status is set to "Information Only" before authorizing the sample record.

## Tests Tab

Select and add Test Method: C93001 - Asphalt Mix Design Properties. For the report facility to function properly, the Sample Test NBr for this test must be 1. Enter all appropriate mix design data into the fields of the test template.

Select and add Test Method: T27 - Sieve Analysis of Fine and Coarse Aggregates. For the report facility to function properly, the Sample Test NBr for this test must be identical to the Material Code for the aggregate listings on the Materials Folder Tab of the Superpave Mix Design window. The first in the series of component aggregates should always be aggr066. Enter aggr066 as the Sample Test NBr for this test. In the test itself, select the same Effective date selected on the Gradations Folder Tab of the Superpave Mix Design window and enter the gradation data into the relevant fields of the test template for that aggr066 mix design aggregate.

Since there is more than one individual component aggregate, select and add Test Method: T27 - Sieve Analysis of Fine and Coarse Aggregates again. The second in the series of component aggregates listed on a mix design should always be aggr067. Make aggr067 the Sample Test NBr for the second test. In this test as well, select the same Effective date selected on the Gradations Folder Tab of the Superpave Mix Design window and enter the gradation data into the relevant fields of the test template for that aggr067 mix design aggregate.

Repeat this T27 test procedure for each individual component aggregate listed on the Materials Folder Tab of the Superpave Mix Design window. If an aggregate contains any asphalt cement (R.A.P.), include the %AC in the appropriate line of the T27 gradation template.

Since combined aggregate gradation data is also required, select and add Test Method: T27 - Sieve Analysis of Fine and Coarse Aggregates a final time. The Material Code for the combined aggregate is aggr076. Always make aggr076 the Sample Test NBr for this final test. In this final test as well, select the same Effective date selected on the Gradations Folder Tab of the Superpave Mix Design window and enter the gradation data (not the JMF) into the relevant fields of the test template for the combined aggregate.

Once it has been determined that the Sample Information Record / test data is correct and functions properly in the report facility, the Sample Information Record is to be authorized to disallow subsequent changes to this additional data.

## [MAT11076A - Asphalt Mix Design Detail Report](#)

The purpose of the report facility is to provide a report containing mix design details, for a mix design associated to a Contract. Once started, the facility has drop-list options for the user to select. Once the Contract has been selected, users should then select the appropriate Mix ID for that Contract. Note that more than one Mix ID may be listed for a Contract.

A URL link to this custom report facility is maintained in SiteManager: Main Panel / Accessories / System Attachments. Double click over the report in the list or highlight it and then click the little blue running man.

### **Requirements of this custom report facility:**

1. Users must be logged onto the network
2. The mix design must first be approved. To approve a mix design in the Superpave Mix Design window, go to the Description folder tab, click Services from the top bar menu and then select the Approve option. Once approved, information in mix design windows cannot be edited.

3. The approved mix design must then be associated to at least one Contract. For details on that procedure reference: **1107.1 Contract Mixes.**

Always make sure all data has been entered, and the detailed procedures in this Policy completed correctly, both in the Superpave Mix Design window area and on the linked Sample Information Record / test templates before approving any mix design. A double check of accuracy before approving would be time well spent.

**Changes to previous versions of this Policy:**

9/6/06: A paragraph was added in the general section discussing UTBWC. Three new UTBWC design types were added to the Mixture Class Codes table.

2/13/2008 - This P&P was updated to include a comment in the Designer Name Section. DSC

7/9/2009 - Updated to include preceding "W" for WMA designs in Mix ID Section. DSC

1/31/2012 - Added RI (Rich Intermediate Layer) to table of Mixture Class Codes