NEW ASPHALT MIX DESIGN SYSTEM FOR OKLAHOMA DEPARTMENT OF TRANSPORTATION

FINAL REPORT ~ FHWA-OK-13-03

ODOT SP&R ITEM NUMBER 2238

Submitted to:
John R. Bowman, P.E.
Planning & Research Division Engineer
Oklahoma Department of Transportation

Submitted by:
Fares Beainy, Ph.D., A.M.ASCE
Sesh Commuri, Ph.D., M.ASCE
Thao Pham
School of Electrical and Computer Engineering
University of Oklahoma, Norman, OK

Musharraf Zaman, Ph.D., P.E., F.ASCE
Associate Dean for Research, College of Engineering
University of Oklahoma, Norman, OK

Dharamveer Singh, Ph.D., A.M.ASCE
Department of Civil Engineering
Indian Institute of Technology, Mumbai, India

March 2013

TECHNICAL REPORT DOCUMENTATION PAGE

1. REPORT NO. FHWA-OK- 13-03	2. GOVERNMENT ACCESSION NO.	3. RECIPIENT'S CATALOG NO.	
4. TITLE AND SUBTITLE New Asphalt Mix Design System For Oklahoma Department Of Transportation		5. REPORT DATE Mar 2013	
		6. PERFORMING ORGANIZATION CODE	
7. AUTHOR(S) Fares Beainy, Dharamveer Singh, Sesh Commuri, Musharraf Zaman, Thao Pham.		8. PERFORMING ORGANIZATION REPORT Click here to enter text.	
9. PERFORMING ORGANIZATION NAME AND ADDRESS University of Oklahoma DEH 110, 110 W. Boyd Street, Norman, OK 73019.		10. WORK UNIT NO.	
		11. CONTRACT OR GRANT NO. ODOT SP&R Item Number 2238	
12. SPONSORING AGENCY NAME AND ADDRESS Oklahoma Department of Transportation Planning and Research Division 200 N.E. 21st Street, Room 3A7 Oklahoma City, OK 73105		13. TYPE OF REPORT AND PERIOD COVERED Final Report Oct 2011 - Mar 2013	
		14. SPONSORING AGENCY CODE	
15. SUPPLEMENTARY NOTES			

16. ABSTRACT

Oklahoma Department of Transportation (ODOT) has been using the Superpave mix design software for several years. The original Superpave mix design software was built around Fox Database and did not meet ODOT requirements. The software currently being used by ODOT is implemented using two Microsoft Excel® files to create asphalt mix designs and is customized for ODOT use. However, the implementation is inefficient and cumbersome to maintain. The aim of this project is to develop a Microsoft Visual Basic based Asphalt Mix Design Software that is efficient and easy to use. Further, all the pertinent data is stored in a SQL database with strict access security. This design enables users to securely access the mix design data over the internet while enabling ODOT personnel to synchronize the data with proprietary data in SiteManager. The Asphalt Mix Design software is developed using industry standard user interfaces and coding techniques to enable its easy maintenance and upgrade.

17. KEY WORDS Asphalt Mix Design, Database, Windows Application.	18. DISTRIBUTION STATEMENT No restrictions. This publication is available from the Planning & Research Div., Oklahoma DOT.		
19. SECURITY CLASSIF. (OF THIS REPORT) Unclassified	20. SECURITY CLASSIF. (OF THIS PAGE) Unclassified	21. NO. OF PAGES 227	22. PRICE N/A

The contents of this report reflect the views of the author(s) who is (are) responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the views of the Oklahoma Department of Transportation or the Federal Highway Administration. This report does not constitute a standard, specification, or regulation. While trade names may be used in this report, it is not intended as an endorsement of any machine, contractor, process, or product.

SI* (MODERN METRIC) CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS				
SYMBOL	**WHEN YOU KNOW**	**MULTIPLY BY**	**TO FIND**	**SYMBOL**
LENGTH				
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
AREA				
in^2	square inches	645.2	square millimeters	mm^2
ft^2	square feet	0.093	square meters	m^2
yd^2	square yard	0.836	square meters	m^2
ac	acres	0.405	hectares	ha
mi^2	square miles	2.59	square kilometers	km^2
VOLUME				
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft^3	cubic feet	0.028	cubic meters	m^3
yd^3	cubic yards	0.765	cubic meters	m^3
NOTE: volumes greater than 1000 L shall be shown in m^3				
MASS				
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
TEMPERATURE (exact degrees)				
^oF	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	^oC
ILLUMINATION				
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	$candela/m^2$	cd/m^2
FORCE and PRESSURE or STRESS				
lbf	poundforce	4.45	newtons	N
lbf/in^2	poundforce per square inch	6.89	kilopascals	kPa

APPROXIMATE CONVERSIONS FROM SI UNITS				
SYMBOL	**WHEN YOU KNOW**	**MULTIPLY BY**	**TO FIND**	**SYMBOL**
LENGTH				
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
AREA				
mm^2	square millimeters	0.0016	square inches	in^2
m^2	square meters	10.764	square feet	ft^2
m^2	square meters	1.195	square yards	yd^2
ha	hectares	2.47	acres	ac
km^2	square kilometers	0.386	square miles	mi^2
VOLUME				
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m^3	cubic meters	35.314	cubic feet	ft^3
m^3	cubic meters	1.307	cubic yards	yd^3
MASS				
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2000 lb)	T
TEMPERATURE (exact degrees)				
^oC	Celsius	1.8C+32	Fahrenheit	^oF
ILLUMINATION				
lx	lux	0.0929	foot-candles	fc
cd/m^2	candela/m^2	0.2919	foot-Lamberts	fl
FORCE and PRESSURE or STRESS				
N	newtons	0.225	poundforce	lbf
kPa	kilopascals	0.145	poundforce per square inch	lbf/in^2

*SI is the symbol for the International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E380.
(Revised March 2003)

Table of Contents

Executive Summary

Oklahoma Department of Transportation (ODOT) has been using the Superpave mix design software for several years [9]. The original Superpave mix design program was developed using Microsoft Excel with embedded VBA macros. While the mix design software met the basic requirements of ODOT, it was difficult to make enhancements or maintain the software. The aim of this project is to develop a Microsoft Windows based application incorporating a standardized database to replace the existing Excel-based software. The mix design software developed in this research project stores design and user data in a SQL database and can be accessed by users over the internet. The software also provides increased security, ease of maintenance, upgrades, and backup while simplifying future revisions and maintenance of the software.

Objectives:

The objective of this project is the implementation of the ODOT Asphalt Mix Design method. This work includes: 1) documenting the design and implementation of current ACMIX software, 2) the migration of the existing Microsoft Excel based software to 2010 Microsoft Visual Basic .Net Windows Application, 3) design and implementation of a MySQL database server that stores the data required in the process of designing asphalt mixtures, and 4) verification of the new ACMIX software using test data provided by ODOT.

The ACMIX software was implemented using Express version of Microsoft Visual Basic. This version is freely available and does not require the purchase of additional software licenses. In addition, MySQL Community Server - a freely downloadable database software along with a set of tools such as Connector/Net (ADO.NET driver for MySQL), and MySQL Workbench (a visual database management application), was used to create the database needed to store the data provided by ODOT Site Manager. The upgrade of the ODOT Asphalt Mix Design software also includes a systematic redesign of the current software to improve its efficiency and to make it easier to maintain and revise in the future. The software was tested and the output compared with the mix designs obtained using the current Excel® based process to verify the accuracy of the new system. The project team is working with relevant personnel from ODOT to facilitate the transition to the new software. Complete documentation of the software is provided to facilitate the adoption of the software by ODOT.

1. Introduction

Traditional methods for the design of Hot Asphalt Mixes for the construction of pavements relied on the Hveem [11] and Marshall [7] methods. The Superpave design [1-4, 11] was introduced in 1993 to improve the materials selection and the mix design process in the pavement design. The Superior Performing Asphalt Pavement System developed under the Strategic Highway Research Program [4, 6] (SHRP) is called the Superpave Mix design and includes the following three steps:

i) a mix design method that accounts for traffic loading and environmental conditions,

ii) a method for evaluating the asphalt binder, and

iii) new methods for analyzing the performance of asphalt mixes.

The objective of the Superpave mix design system was to define an economical blend of asphalt binder and aggregate that yields a mix having satisfactory performance characteristics over the service life of the pavement [3, 4, and 11]. The design process in steps i – iii above relies on volumetric calculations and graphs [1], those are cumbersome to perform manually. While the design of asphalt mixes with optimum performance is of interest to several State Department of Transportations' (DOTs) and Federal agencies, there is no software available in the public domain today that can be used to automate the mix design process.

In recent years, several DOTs have developed Asphalt Mix Design software applications that are customized to their specific needs. For example, Kentucky Department of Transportation (KYDOT) uses a web-based software program [5] to design the Superpave mix. This allows the user to generate a new mix design or modify a previously designed mix. In addition, the user will be able to design a new Superpave mix based on an existing mix design. Zaniewski and Padula [13] developed an Excel®-based calculator program to design Superpave mix for West Virginia Division of Highways. The Excel® sheet contains several macros were used for this purpose. Similarly, the North Carolina Department of Transportation [8], the Pennsylvania Asphalt Pavement Associations [10], and the Oklahoma Department of Transportation [9] have all developed software implementations of the Superpave mix design process that are customized to their specific needs.

2. Implementation Methodology

The Superpave asphalt mix design is a comprehensive method to ensure better performance of the pavements [12]. In this method, the asphalt mix design in accomplished in two phases: selection of aggregates, and selection of asphalt binders. First the quality of the aggregate is checked by its consensus and source properties. The source properties of aggregates include toughness, durability, and deleterious materials in the aggregates; while the consensus properties that are considered are the angularity of the coarse aggregates, the angularity of the fine aggregates, flat and elongated particles, and the clay content in the aggregates [3].

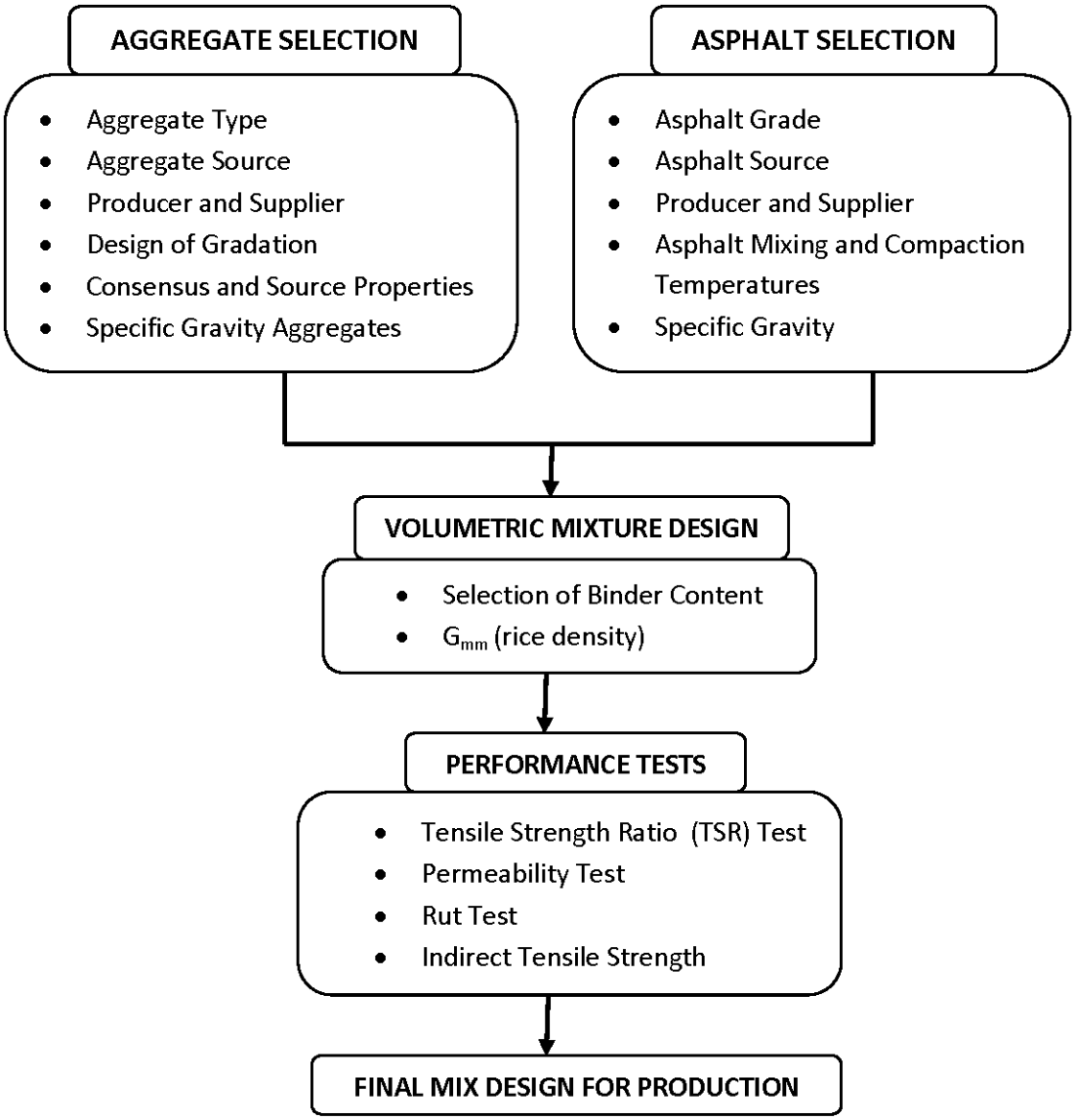


Figure 1. A flowchart showing the main steps of an asphalt mix design process.

The second step in the design process is the determination of the required gradation of the aggregates. In this step, the quantity of different sizes of the aggregates to be used in the mix is determined. Superpave specifies the aggregate gradation based on the nominal maximum size of aggregates (NMS). It is recommended that the combined gradation of the mix pass between established control points and avoid the restricted zone listed in the specification. Once the gradation is determined, the next step is to perform the volumetric design of the mixture, wherein the optimum asphalt content is determined. The Superpave Gyratory Compactor (SGC) is used to compact the samples at a wide range of asphalt content. Performance-based tests such as the rut, permeability, tensile strength, and indirect tensile tests are then conducted on the compacted samples at optimum asphalt content, before the design is accepted for production. The flowchart of the mix design process is shown in Figure 1 above.

The specification of the asphalt mix requires the tabulation of additional information such as the producer and supplier of the raw aggregate materials, properties of the aggregates and the binder, gradation analysis, and the design of the mix gradations. Therefore, a coherent strategy is required to collect and manage this information. Currently, ODOT uses two Excel® files (ACMIX “asphalt mix” and SM “site manager”) to create asphalt mix designs. The ACMIX is used for asphalt mix design, while SM is used to import data such as the supplier/producer information, technician names etc. from the SM database into the ACMIX. The SM database is maintained by ODOT and is updated daily.

3. Requirements Overview

The ACMIX file comprises of 30 sub-modules, each of which implements a different step in the mix design process (see Tables 1 and 2 in the Appendix). The data is loaded into the Excel sheets and any modification of the data requires that all the sheets to be refreshed in order to ensure consistency of the data. Furthermore, it is not feasible to query all asphalt mix designs in the current format.

The ACMIX software that was developed during this project replaced the Excel and VBA modules in the current implementation with modules implemented in VB .Net. The new software is designed in accordance with object oriented principles to create the Hot Mix Asphalt design software that is optimized for size and speed and allows efficient management of the data. The new software can be implemented in a distributed manner and allows multiple users from remote locations to simultaneously create and validate mix designs over the internet. The software architecture that is implemented makes possible the future transition to a mobile-based or web-based version of the software.

At the start of the project, the development team met with ODOT asphalt mix design team to review and validate the requirements specifications and agree on an implementation plan for the new AC Mix design system. In addition, test scenarios for validating the new implementation of AC Mix process were also determined. Figure 2 shows a high level workflow of the mix design program.

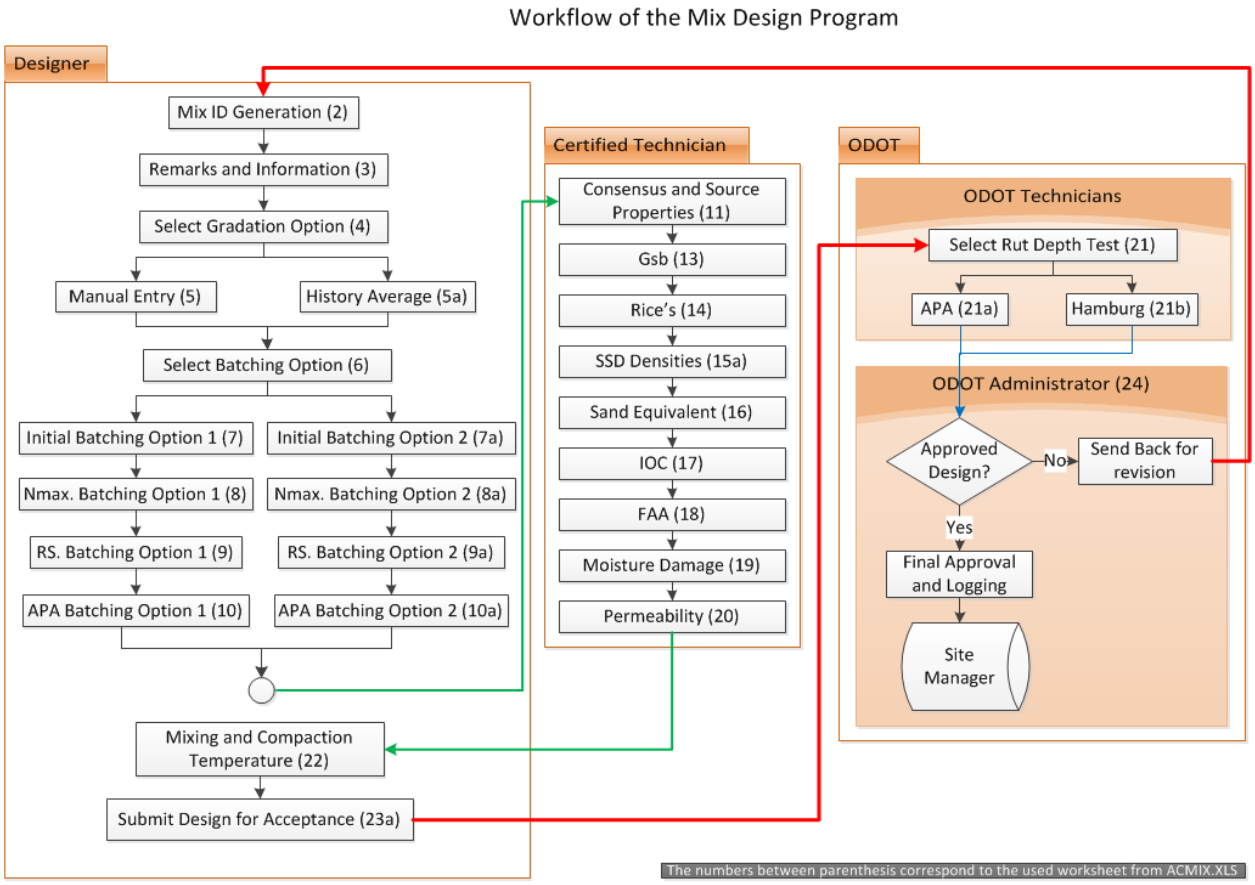


Figure 2. A diagram showing the workflow of ODOT mix design program.

4. System Architecture

Existing System: The existing mix design program comprises of two Excel files: "ACMIX.xls" and "SM_Data.xls". The first file is a set of worksheets that houses the calculations and storage of the different mix design components. The second file, the "SM_Data.xls", is a structured collection of data acting as database storage for data such as the supplier/producer information, technician names, mix design requirements and limitations etc. The SM_data.xls file is populated with data from the Site Manager main database of ODOT, and it is updated daily using a batch script. Mix designers download both files on their local computers Figure 3 shows a diagram of the existing asphalt mix design system at ODOT.

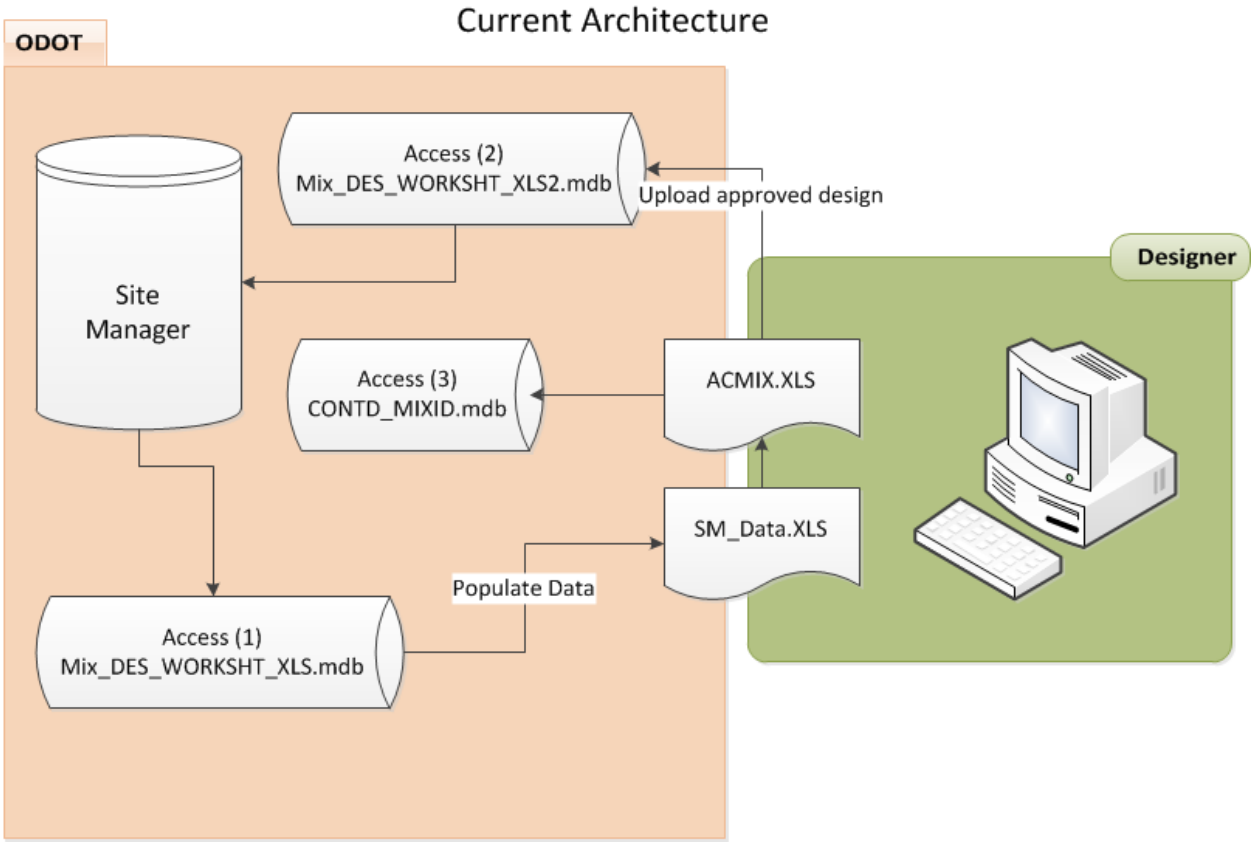


Figure 3. System architecture of the existing ODOT asphalt mix design program.

New System: During this project, a MySQL database-driven Windows Application was developed for designing asphalt mixes by certified designers. The system can be virtually divided into two parts: 1) the data storage part, and 2) the data calculation/presentation part. The data storage part of the system is physically located at centralized computer server at ODOT's headquarters. This scenario would increase the security aspect of the system. The calculation/presentation part of the system is a windows application that can be distributed by ODOT to designers as an executable version downloaded over the internet or through the use of CD-ROM / flash memory drives. The user or designer can run the application on any Personal Computer (PC) that has Windows operating system and internet access. The windows

application retrieves material data (mix types, designing labs, supplier/producer information, etc.), and design constraints (gradation limitations, mixing temperatures, etc.) from the MySQL database over the internet. At any point during the design process the user can save his/her progress and exit the application. The user can open an incomplete/not-submitted form at any time and continue the design process. Once the design is complete, the user can submit the form by saving the design to the MySQL server and updating its status. Figure 4 shows a schematic representation of the new asphalt mix design system.

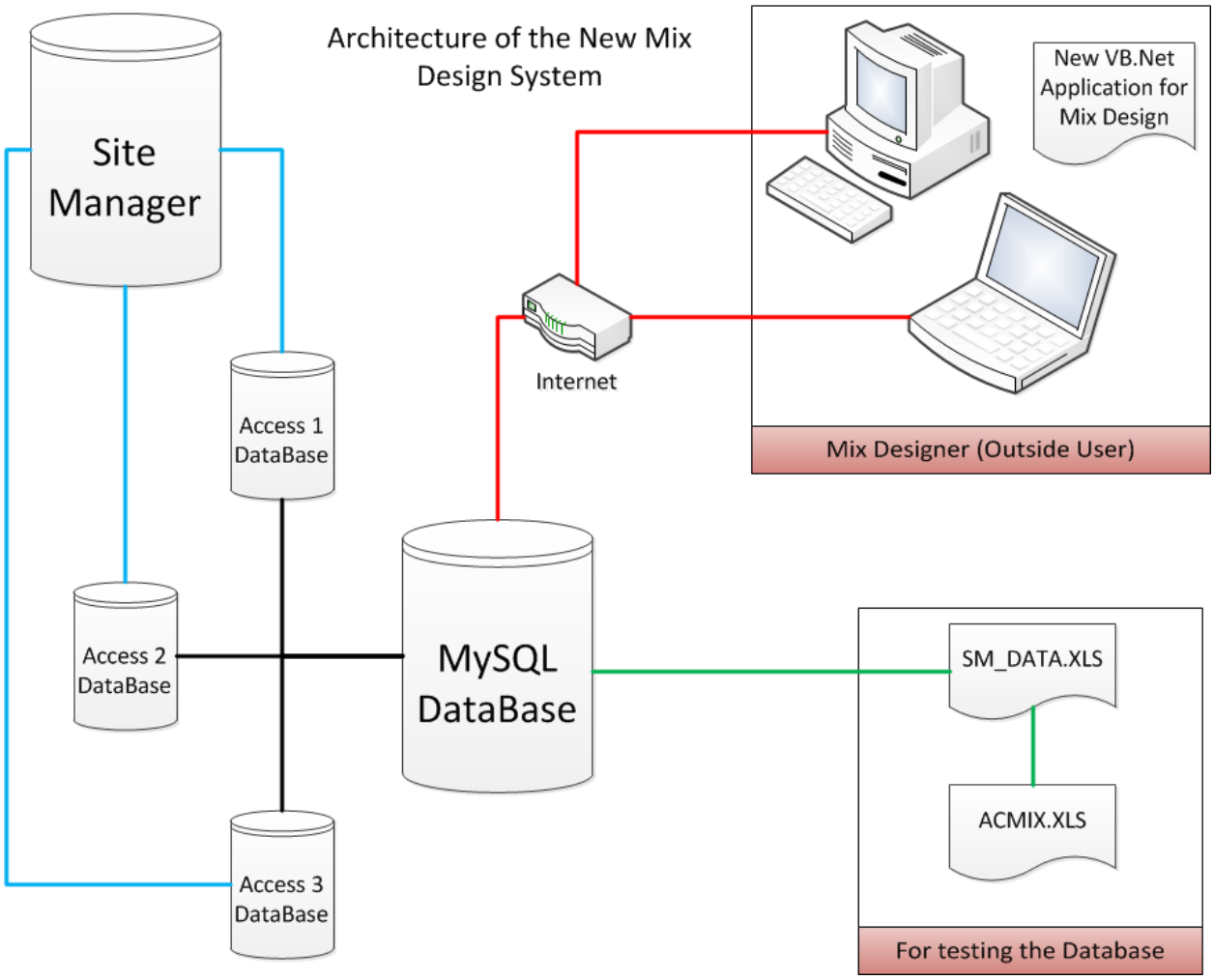


Figure 4. System architecture of the new asphalt mix design system for that is developed by this project for ODOT.

5. Development of the Database

An Optiplex Dell desktop, with i5 processor (3.3 GHz) and 8 GB of RAM, was purchased to host the MySQL server. A static external IP was setup for the MySQL server, what makes it accessible from anywhere over the internet. MySQL Community Server 5.5.23 was installed and was configured for remote access.

A thorough analysis of the existing databases was first conducted. Table 1 shows the dependencies between the ACMIX worksheets and SM_Data tables. Figure 5 show the tables of the access database that are used to populate the SM_Data. As a result, a database was designed and implemented in MySQL. Then, data from SM_DATA and the Access databases were ported into MySQL and the design was streamlined and optimized for size and efficiency (see Figures 6 and 7). Tables were populated either with data from ODOT databases or using user supplied values. Different levels of user access and security were included to enable remote access to the mix design software as well as to modify database content. Tables were created in MySQL database to allow specific design requirements based on the gradation effective date.

Table 1. Dependencies between the ACMIX sheets and SM Data tables.

ACMIX Design Sheet	SM Data Sheets
1A	
2A	25S, 42S, 43S, 44S, 45S, 46S, 47S
3A	36S, 38S,39S, 27S, 28S,
4A	
5A	39S, 34S, 35S, 30S, 26S, 6S-13S
6A	34S, 35S, 30S, 26S,14S-21S
7A	
8A	48S, 32S, 23S, 25S or 2A, 38S or 3A,5A (ACMix)
9A	48S, 32S, 23S, 25S or 2A, 38S or 3A ,6A(ACMix)
10A	25S or 2A, 38S or 3A, 48S, 23S or 8A, 5A, 32S
11A	25S or 2A, 38S or 3A, 48S, 23S or 9A, 6A, 32S
12A	25S or 2A, 38S or 3A, 48S, 23S or 8A, 5A, 32S
13A	25S or 2A, 38S or 3A, 48S, 23S or 9A, 6A, 32S
14A	25S or 2A, 38S or 3A, 48S, 23S or 8A, 5A, 32S
15A	25S or 2A, 38S or 3A, 48S, 23S or 9A, 6A, 32S
16A	5A or 6A, Durability, FF, LA, MD, F&E (Separate Source), 50S
17A	
18A	39S, 25S or 2A, Gradation (8A or 9A), 10A or 11A
19A	39S, 25S or 2A, 17A, 18A, 48S, Gradation (8A or 9A)
20A	39S, 25S or 2A
21A	39S, 25S or 2A
22A	39S, 25S or 2A
23A	39S, 25S or 2A
24A	39S, 25S or 2A
25A	
26A	39S, 25S or 2A

27A	39S, 25S or 2A, 23S
28A	50S
29A	
30A	
This table lists the IDs of the sheets because of space constraints. For more details about the sheets please refer to tables 1 and 2 in Appendix A.	

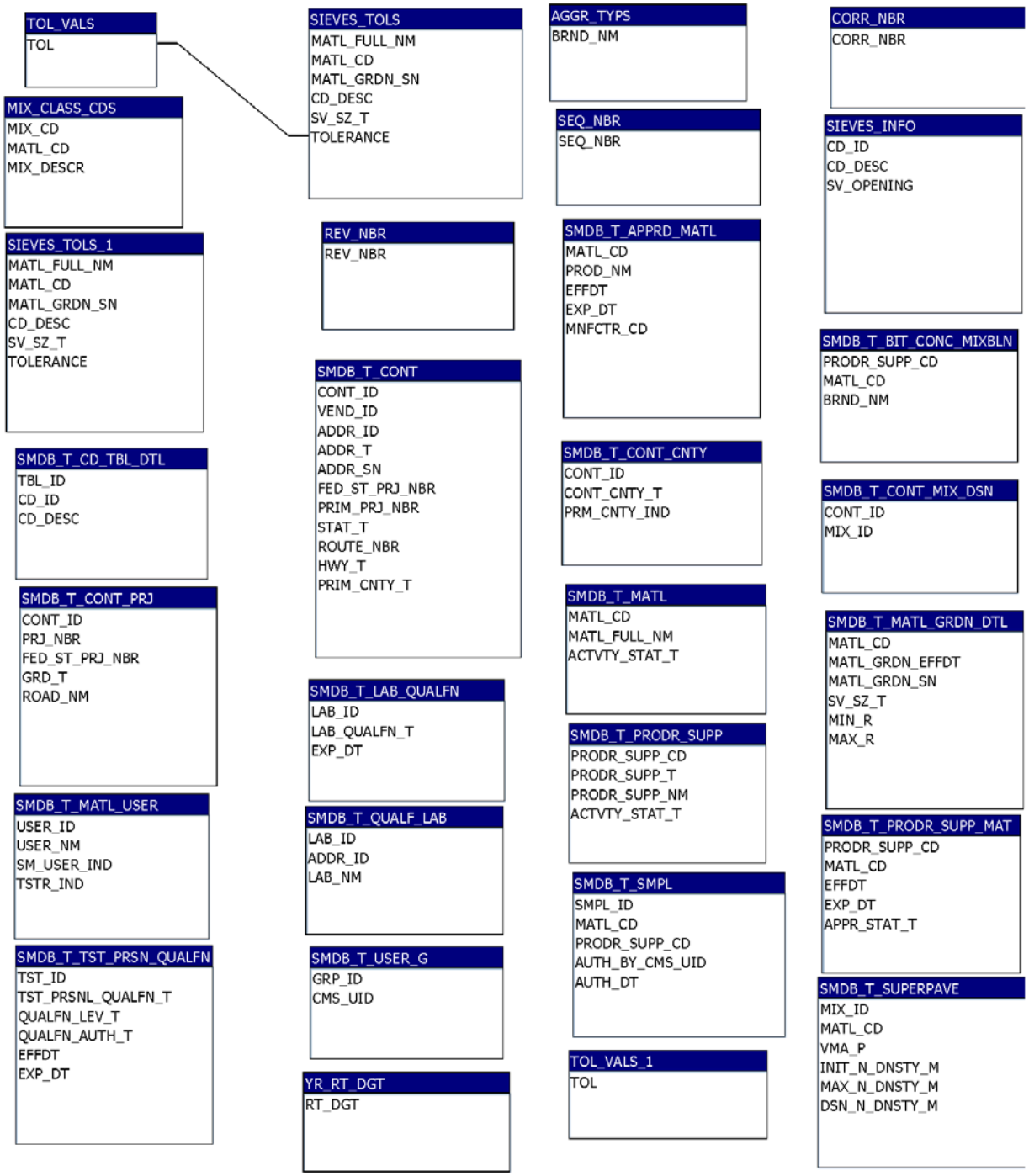


Figure 5a. Access database tables that are used to populate the SM_Data.xls.

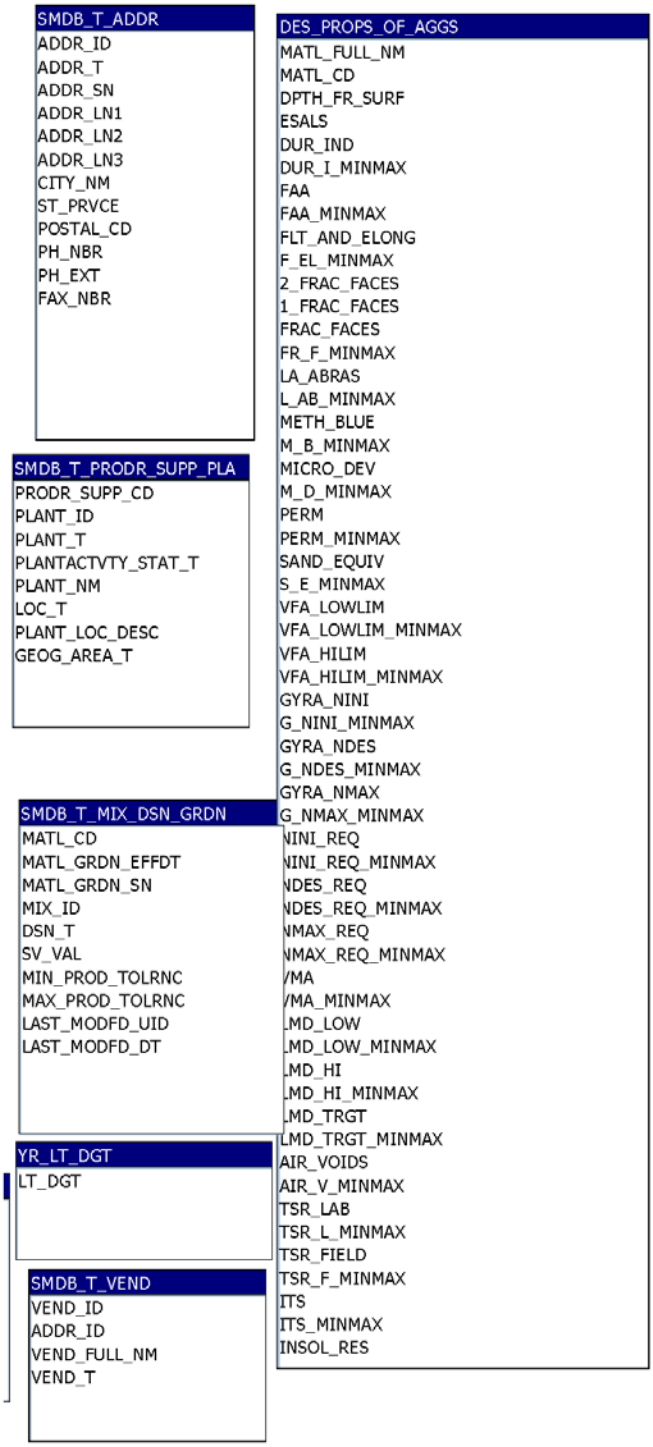


Figure 5b. Access database tables that are used to populate the SM_Data.xls.

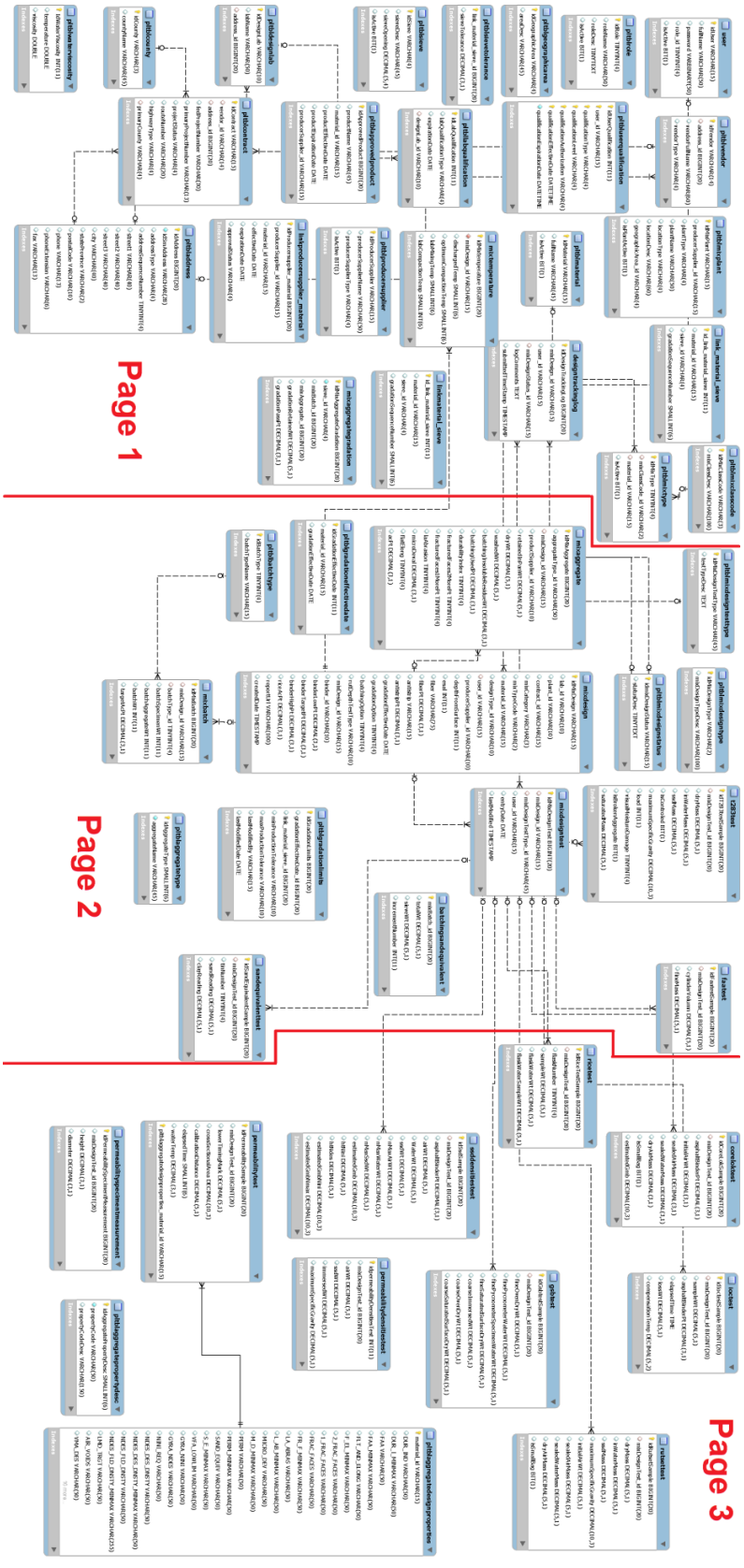


Figure 6. MySQL database tables structures and relationships.

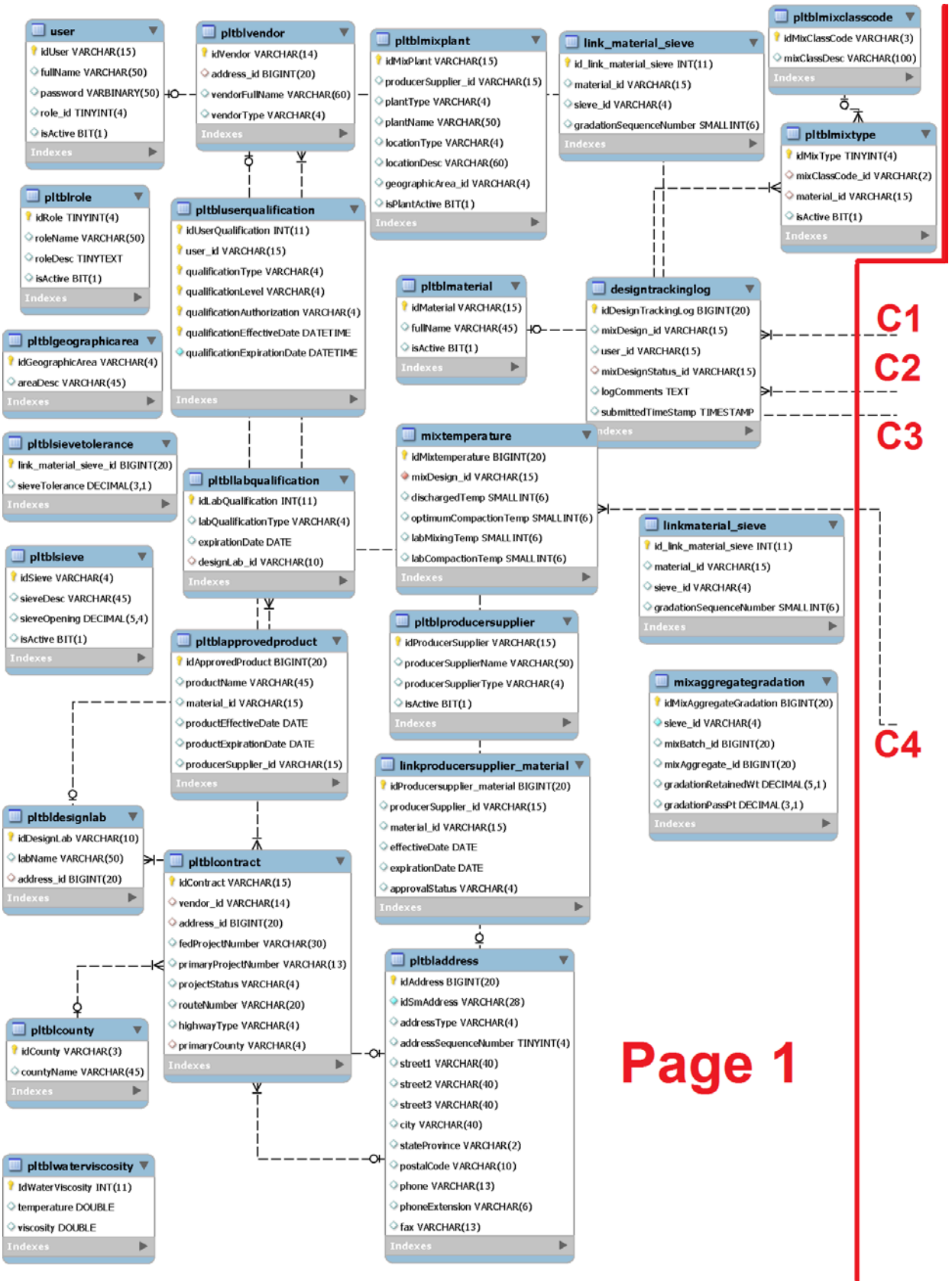


Figure 7a. MySQL database tables structures and relationships.

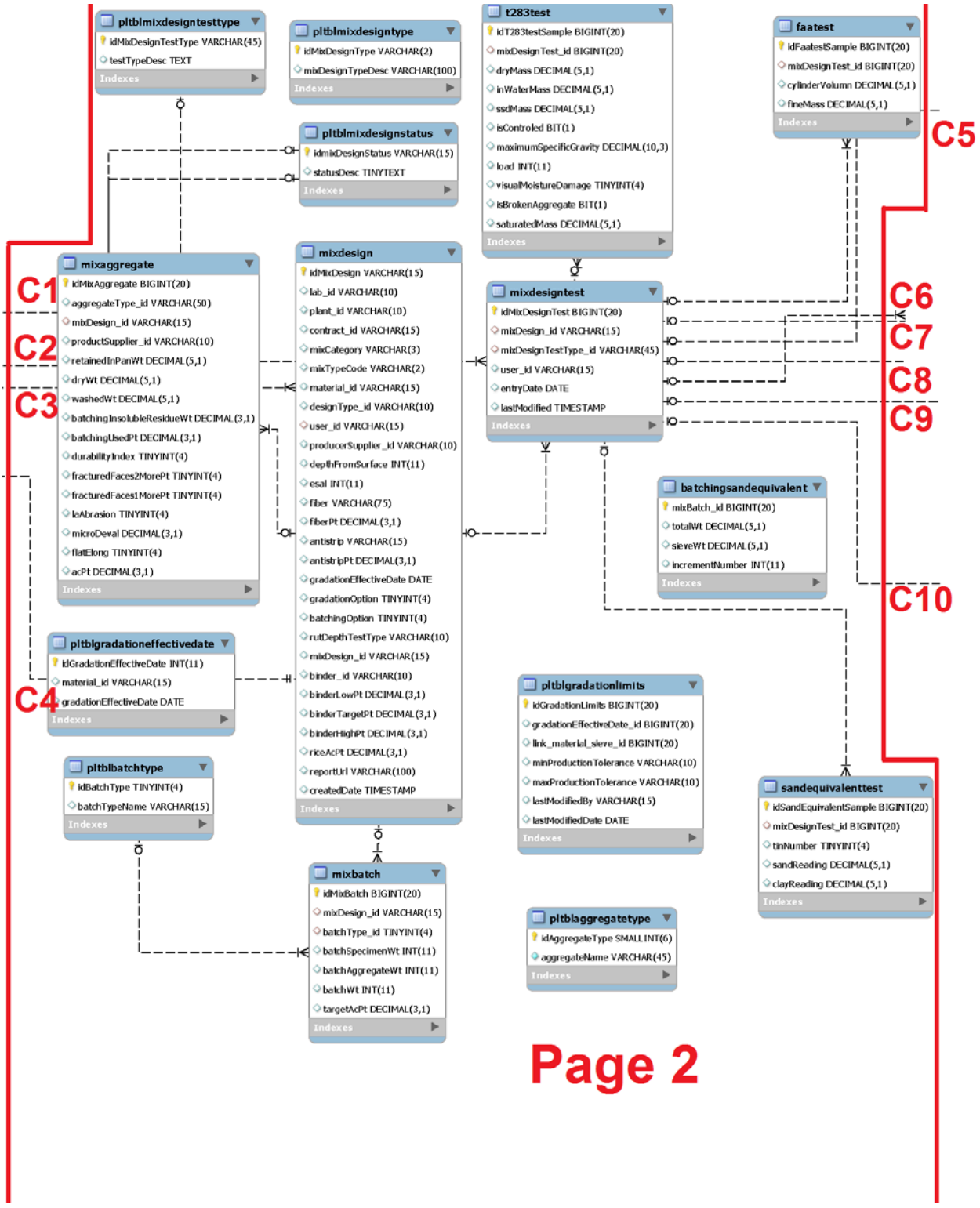


Figure 7b. MySQL database tables structures and relationships.

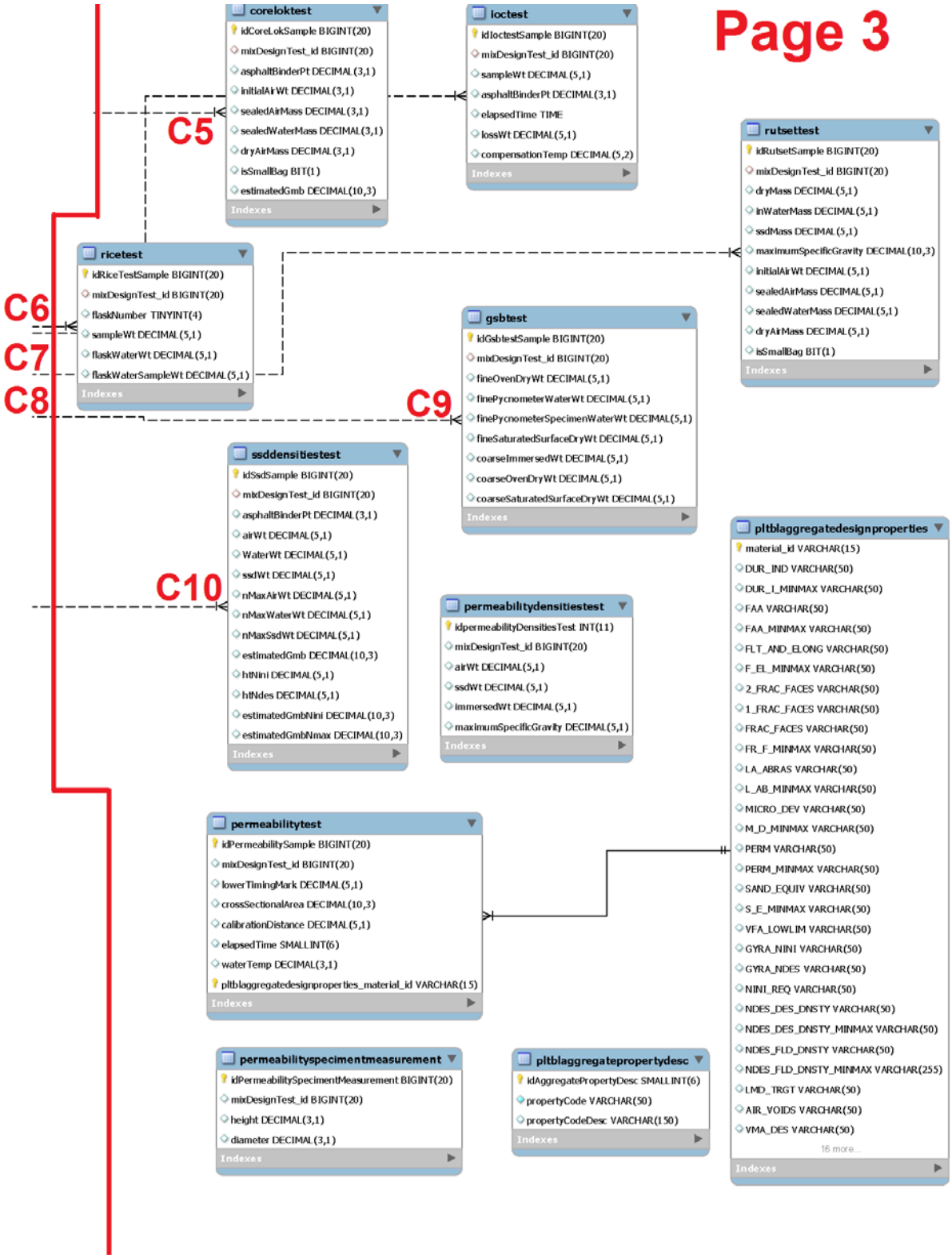


Figure 7c. MySQL database tables structures and relationships.

6. Development of the Windows Application

Existing spreadsheets and software modules (see Appendix B for more details) were converted to Visual Basic .Net windows forms and their functionality and accuracy in designing asphalt mixes was demonstrated. The different windows forms of the new mix design application are documented in this section.

Login form: Once the application, "ODOT_ACMIX.exe", is launched, a Login window will pop up prompting the user to enter his/her username and password (see Figure 8). Once the user enters appropriate username and password, and based on the user's information, a second window will pop up showing mixes developed by the user and mixes developed by other users (see Figure 9). As long as the computer is connected to the internet, the ODOT_ACMIX application can remotely access the database in a transparent and seamless manner. An Advanced Encryption Standard (AES) algorithm is implemented where a hash key is used in the windows application as well as in the acmix_dev database to encrypt/decrypt usernames and passwords for added security.

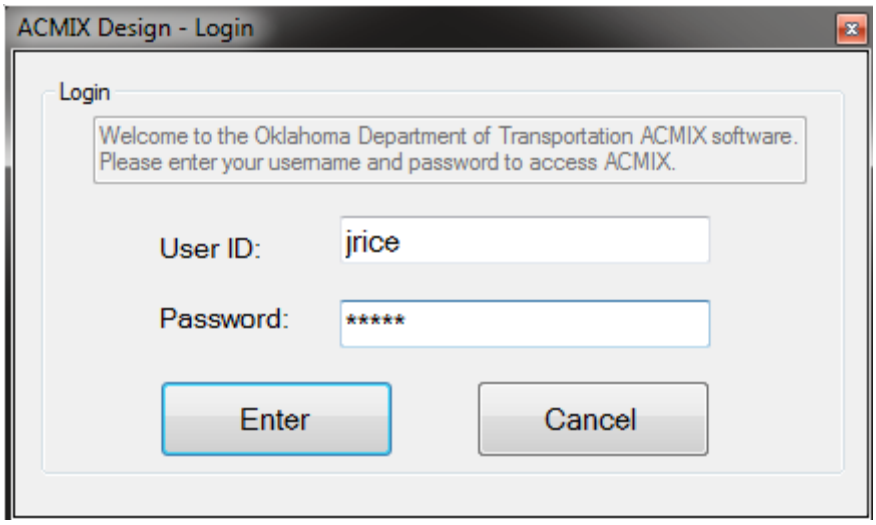


Figure 8. Login form.

Main menu form: The user (or designer) will have several options on how to proceed: 1) create a new mix, 2) create a new mix based on one of his previous mixes, 3) edit one of his existing mixes, and 4) create a new mix based on a mix by other designers. Once the user selects an option, a new window form will pop up showing the basic mix info tab (see Figure 10a).

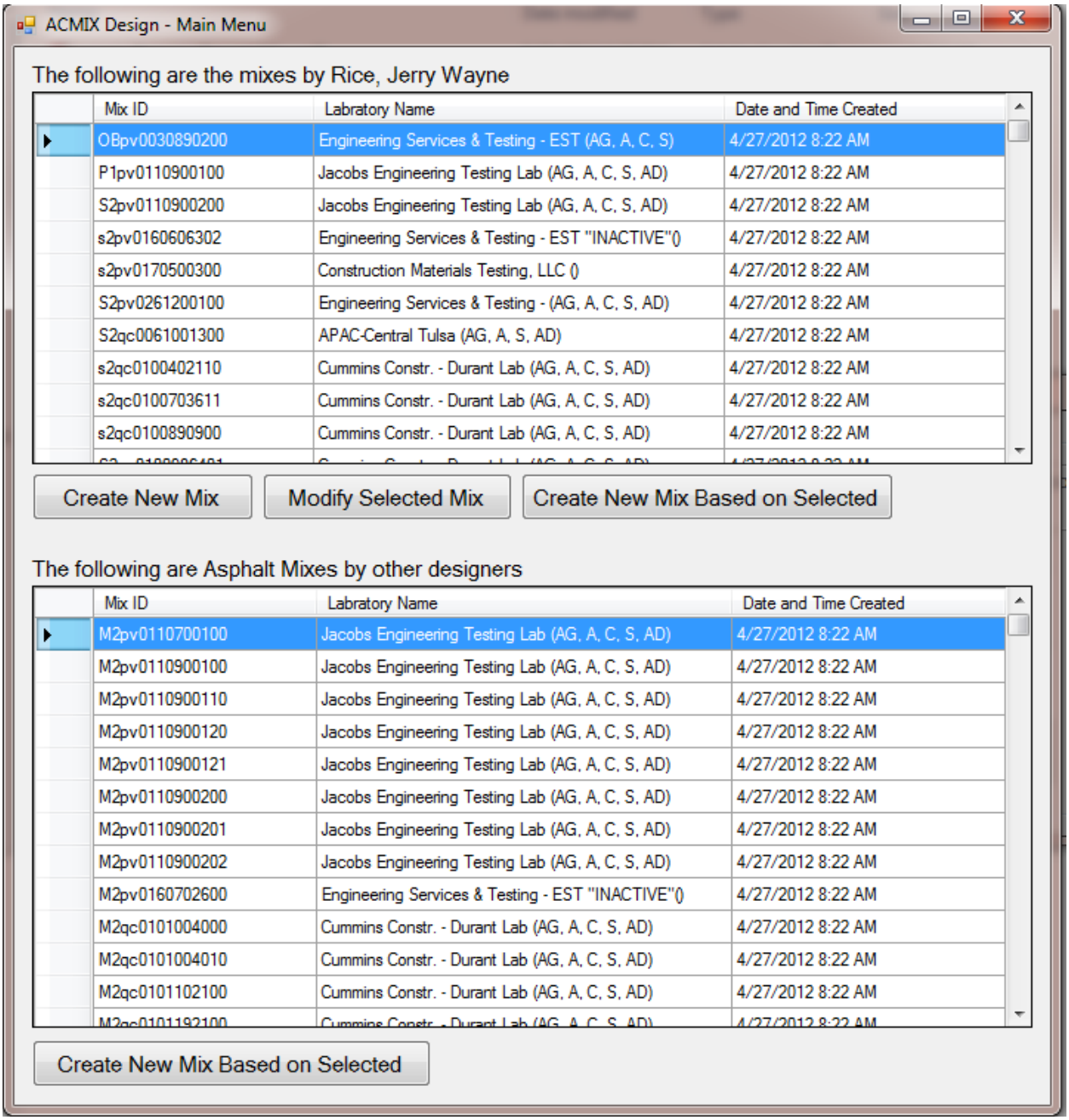


Figure 9. Main menu form.

Basic mix information tab: based on the button that of the user clicked, the mix design tabs would be either empty (creating a new mix) or populated with existing mix data. The user cannot progress with the mix design process until values for the following four tabs are selected:

1. Mix category (HMA or WMA).
2. Mix aggregate gradation Nominal Maximum Size (NMS).
3. Mix type (ex: S4 PG 64-22).
4. Designing laboratory.

After the appropriate information is entered by the user, the mix ID is automatically generated and the gradation button is enabled to proceed to the next step in the mix design process.

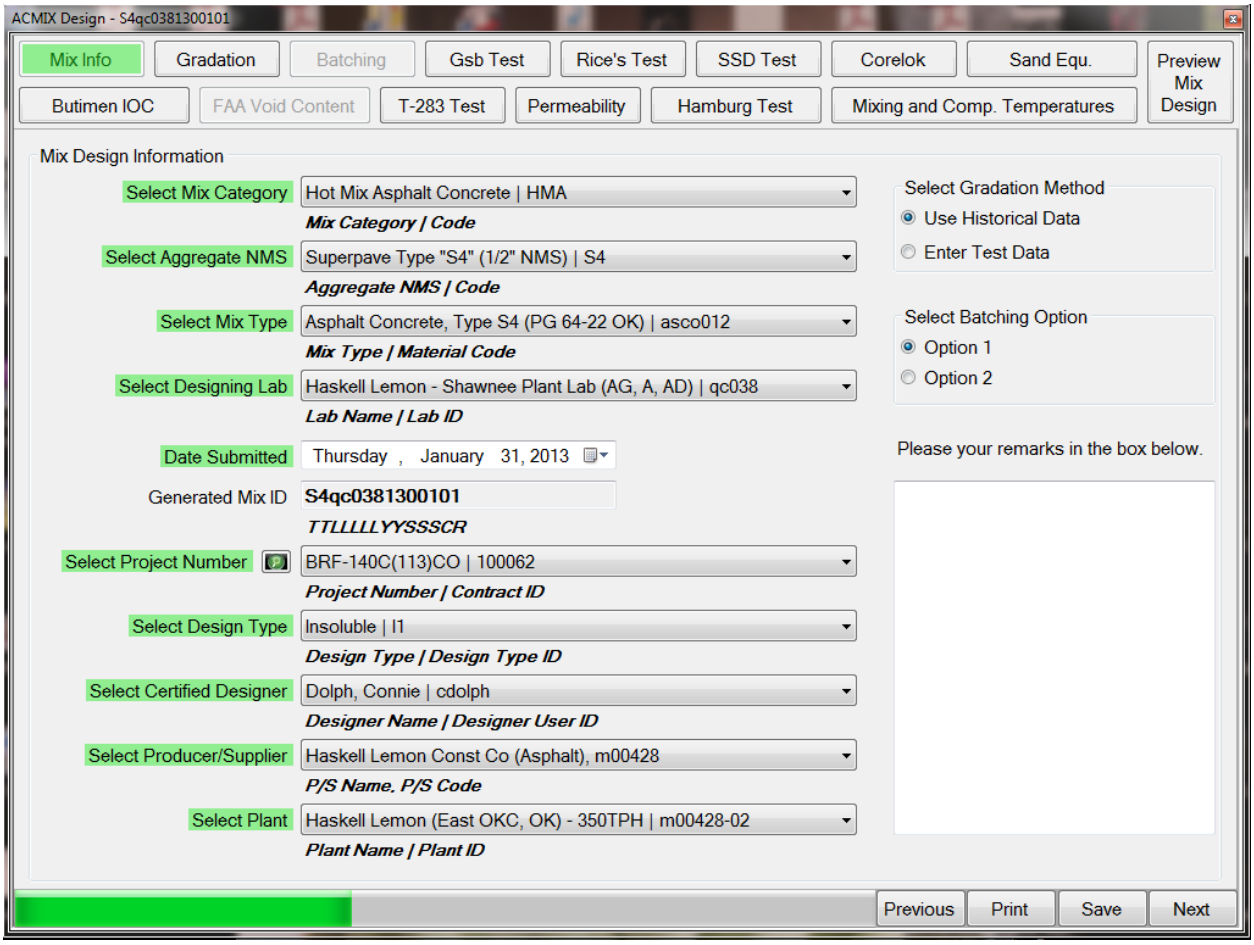


Figure 10a. Basic mix information tab.

Adjacent to the "Select Project Number" label on the 'information' tab, a green button is added to help in filtering the listed projects. Clicking this button will create a window that will enable the user to dynamically (as the user types) filter down the list of projects based on three criteria: contract ID, contractor, and route number (see Figure 10b).

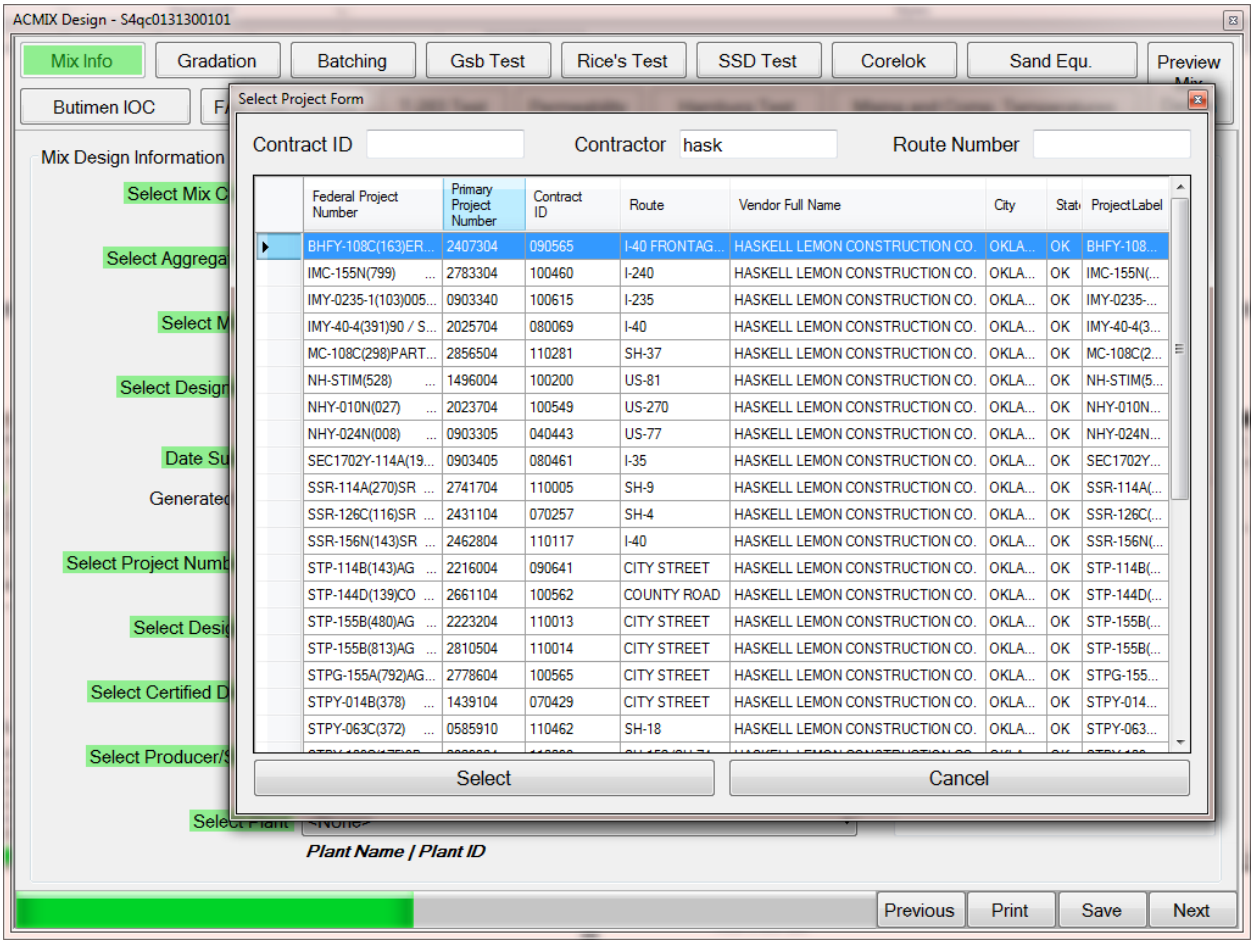


Figure 10b. Basic mix information tab.

Aggregate gradation tab: Once the user selects the Gradation button, the information tab is replaced by the gradation tab in a seamless transition. On the gradation tab, the user is required to select the name of the certified technician and the effective date of the gradation from drop down menus. The user would also enter the test date using a calendar popup type of control (see Figure 11a).

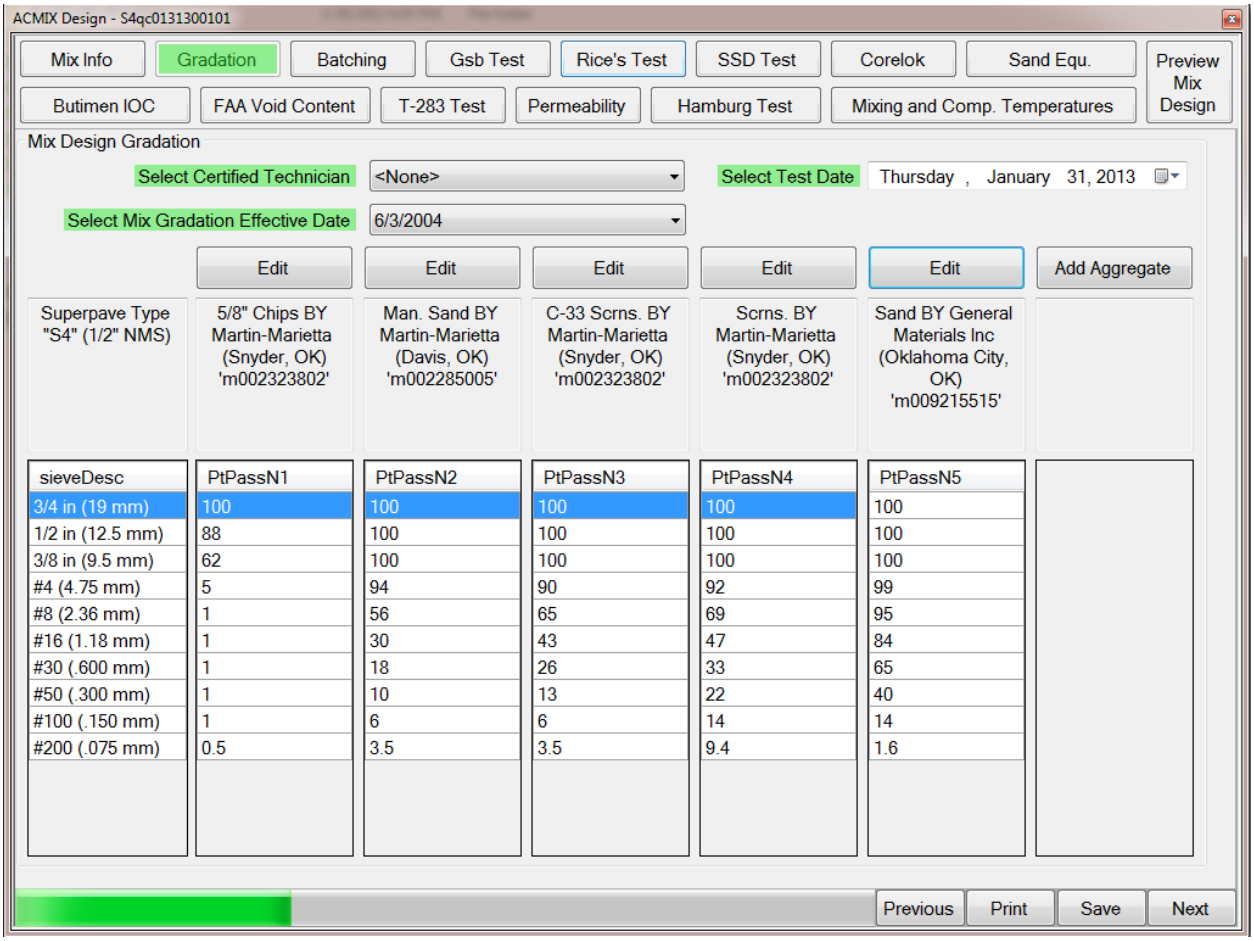


Figure 11a. Aggregate gradation tab.

The user is allowed to enter up to six different aggregates. An "Add" button is available for each aggregate. Once the add button is clicked, a window pops up allowing the user to enter gradation data (see Figure 11b). Depending on the selected option on the information tab (see Figure 10a) "Select Gradation Method": "Enter Test Data" or "Use Historical Data" the percent passing is either automatically calculated or entered, respectively.

After entering gradation data, the add buttons becomes "Edit" and once the "View" button is clicked, the saved gradation data is shown in the box on the right (see Figure 11a).

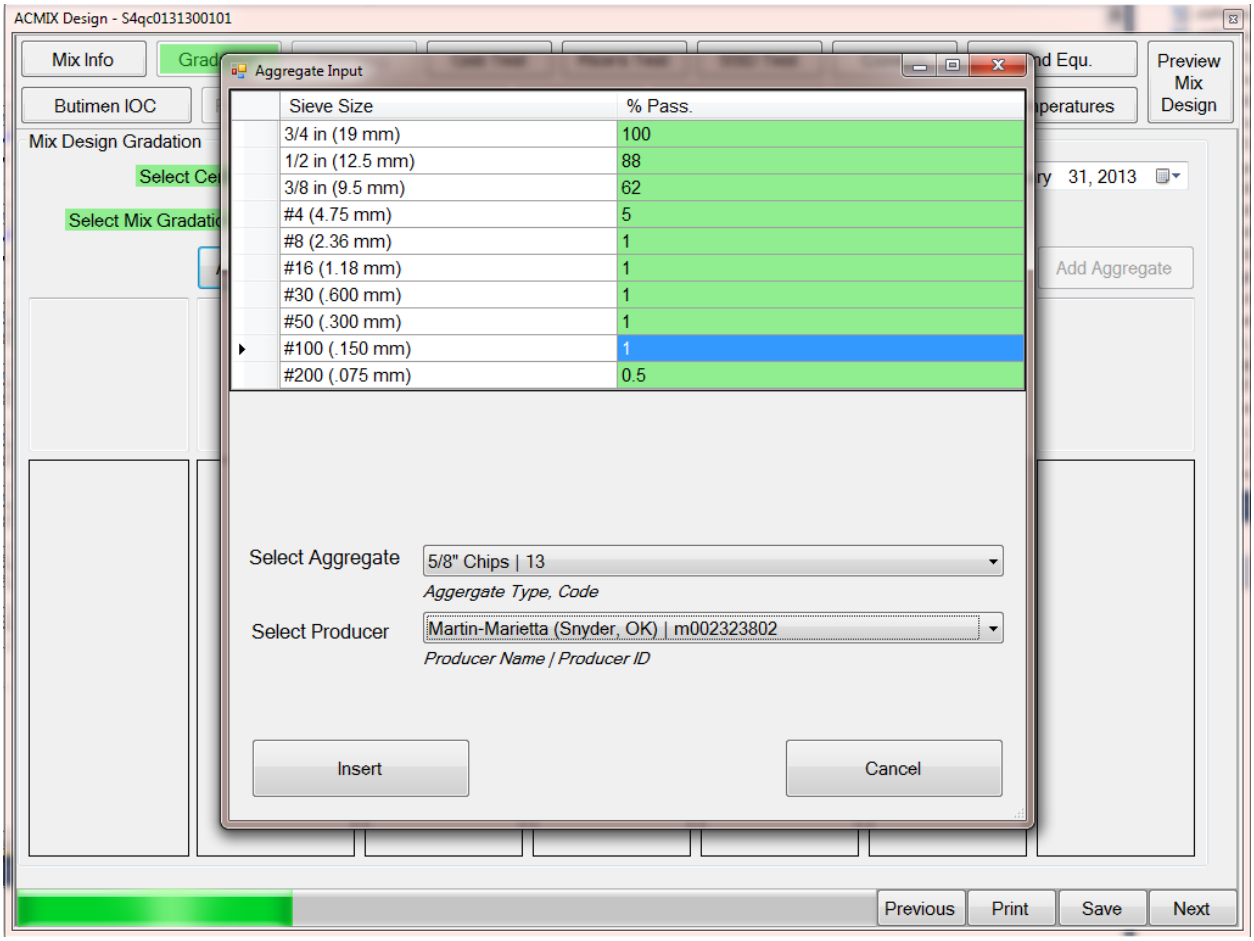


Figure 11b. Aggregate gradation tab.

Aggregate batching tab: the batching tab would load all aggregates gradation in one table and add a column that automatically calculates the combined gradation based on aggregate percent used (see Figure 12a). The batching tab has sub-tabs (see Figures 12a, 12b, 12c, and 12d): 1) “Combined Aggregate”, 2) “Initial Batching”, 3) “R.S. Batching”, and 4) “Consensus & Source Props.”. The user would type in the aggregate percent used in a text box and the combined gradation would be updated automatically. The user can also use a TrackBar control to dynamically change the value of the percent used and see the calculations update dynamically, even is sub tabs such as “Initial Batching”, “R.S. Batching”, and “Consensus & Source Props.”

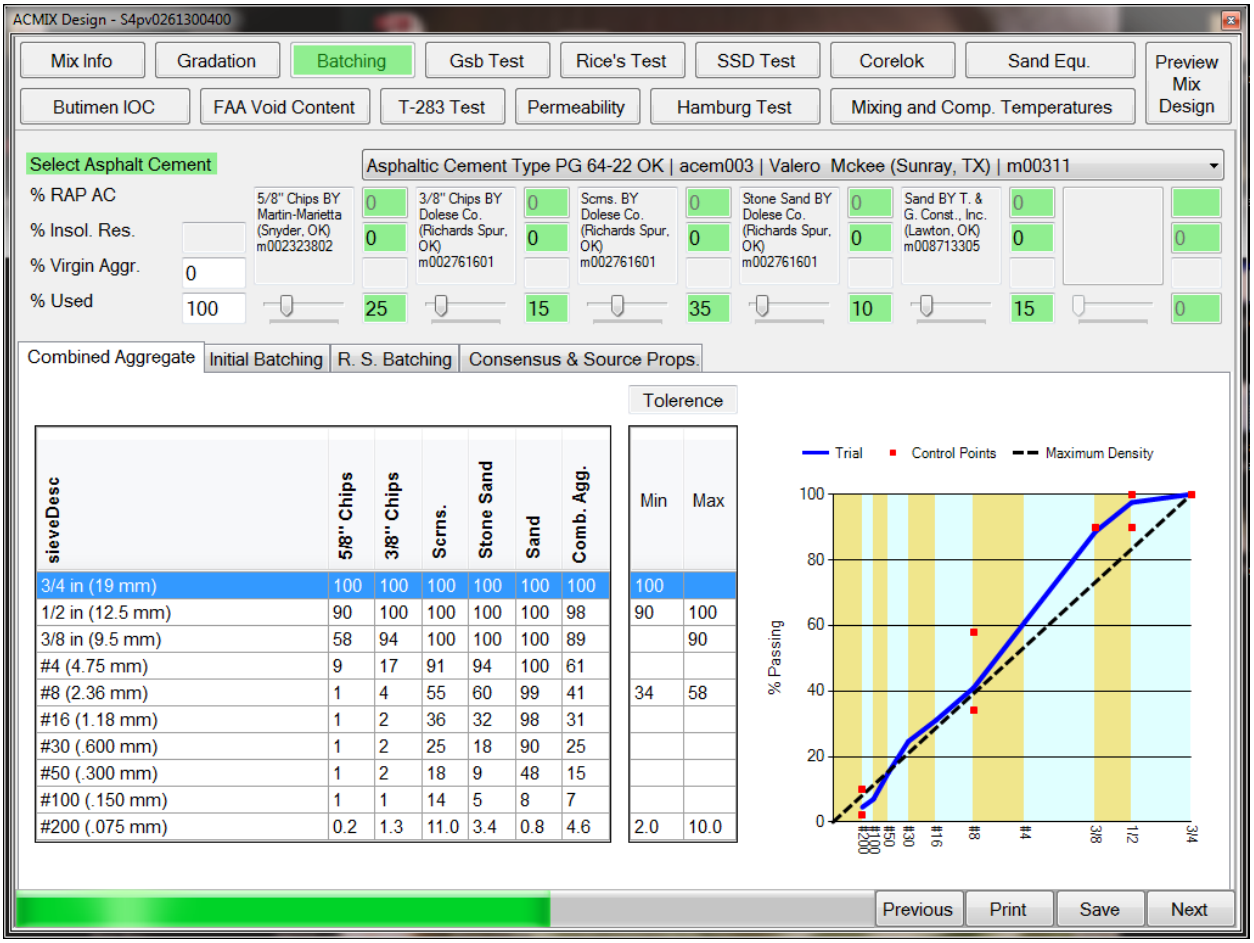


Figure 12a. Aggregate batching tab.

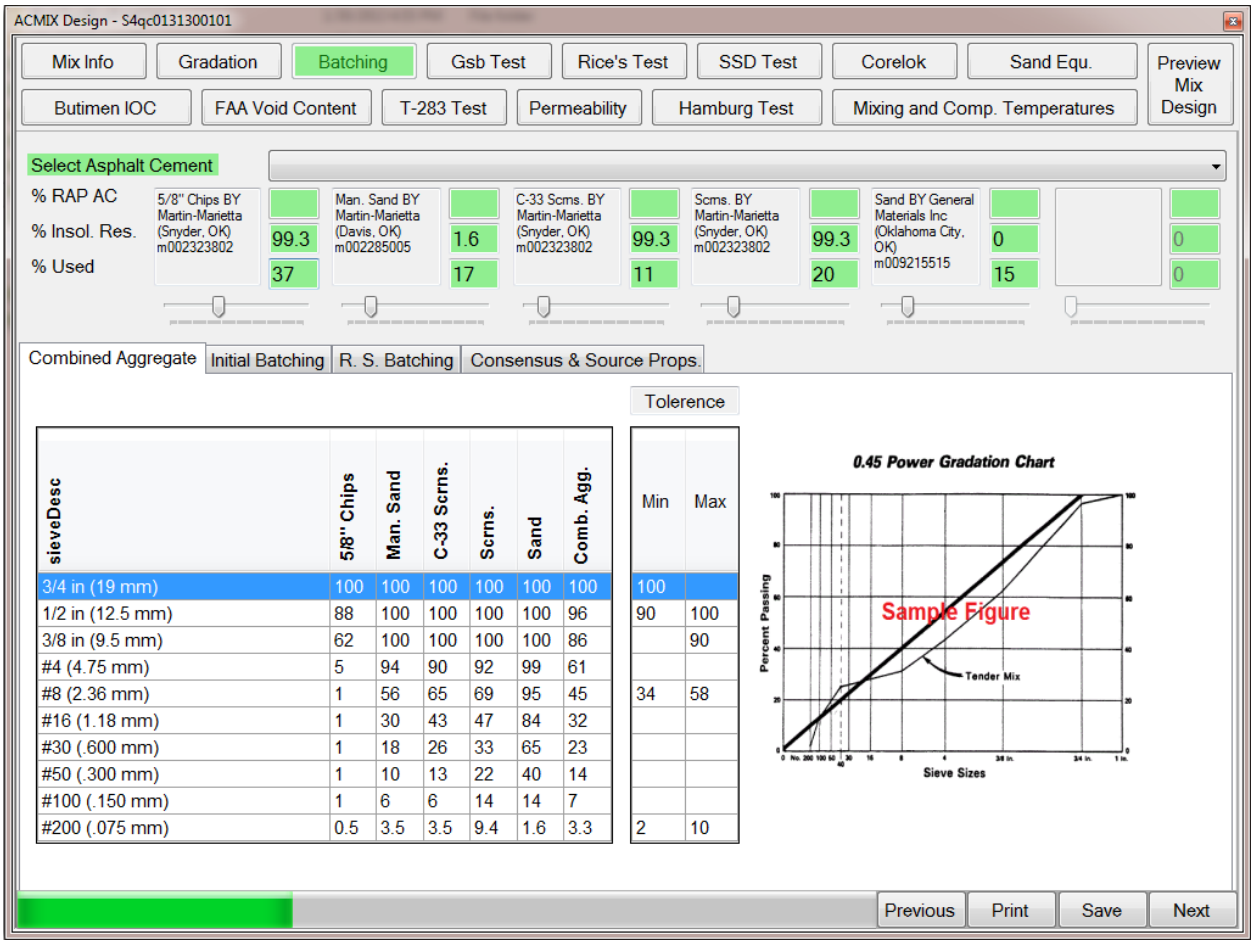


Figure 12b. Aggregate batching tab.

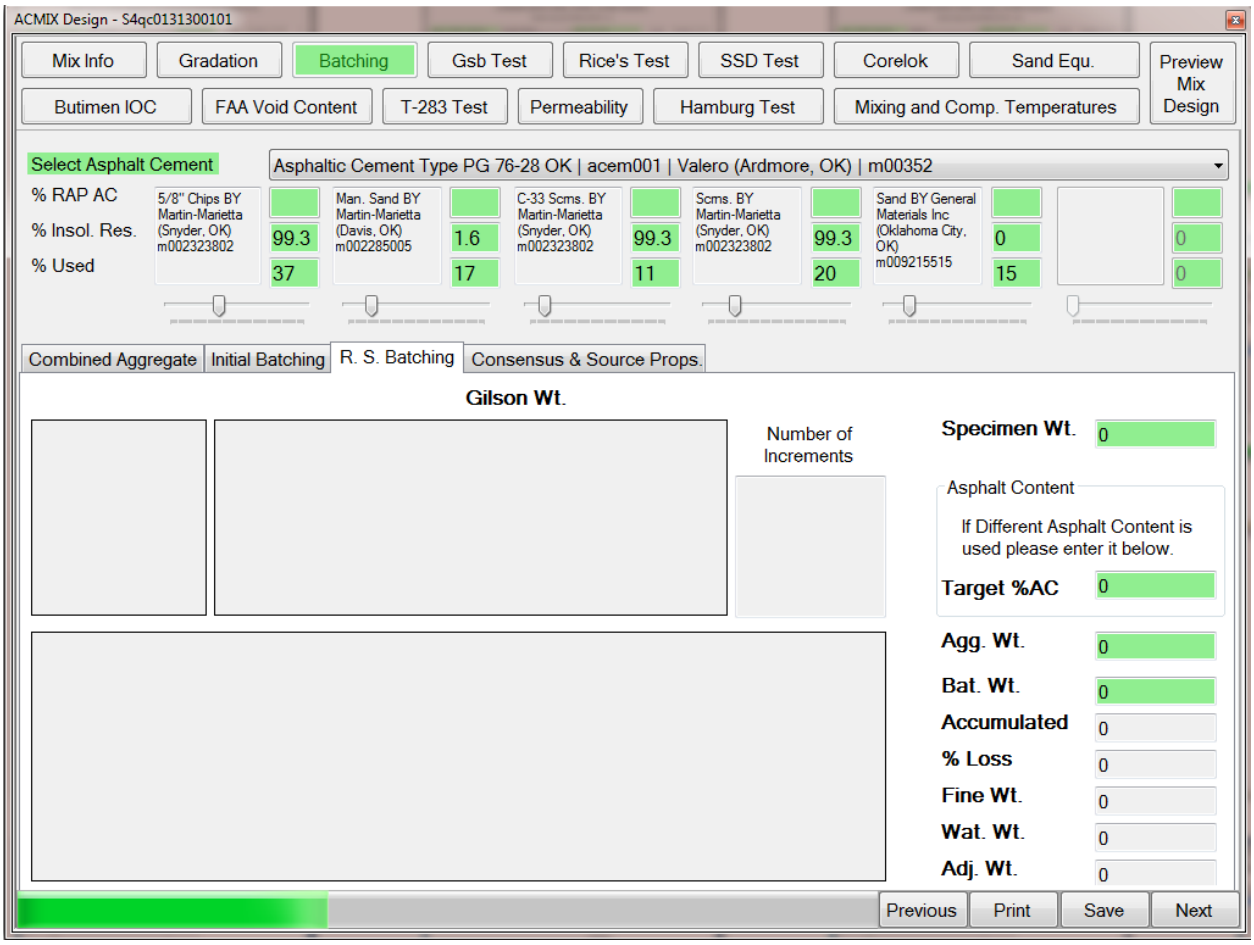


Figure 12c. Aggregate batching tab.

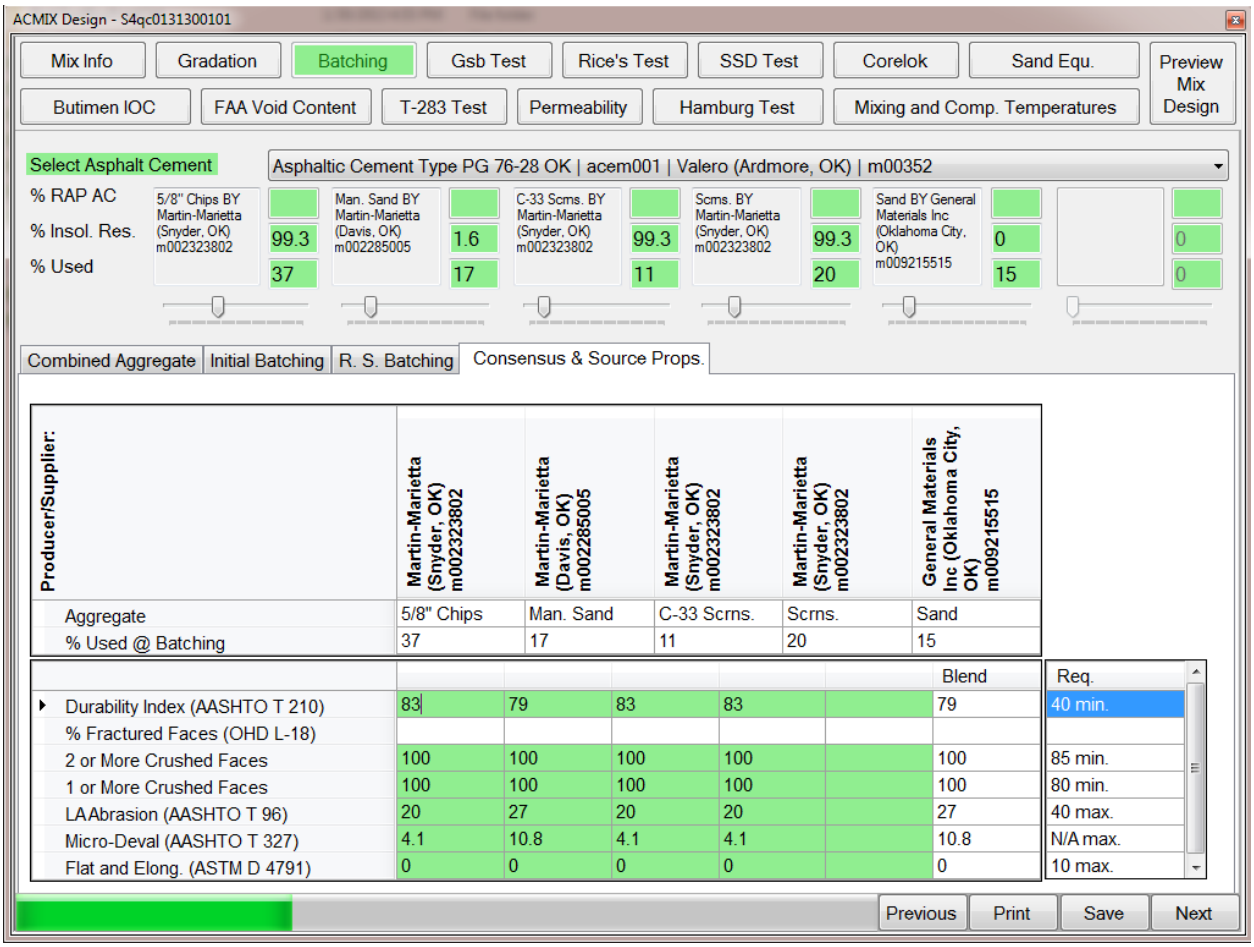


Figure 12d. Aggregate batching tab

Gsb test tab: The main features of the new mix design program are flexibility and robustness. Therefore, as long as the user has entered the information needed to generate a mix ID (mix category, mix aggregate gradation NMS, mix type, and designing laboratory), he/she will have access to all the performance test tabs. The user can enter data for any test at any time in any order. Figure 13 shows the Gsb test tab that is used to enter information for test method AASHTO T-84 and T-85, specific gravity and absorption of fine and coarse aggregate standard test.

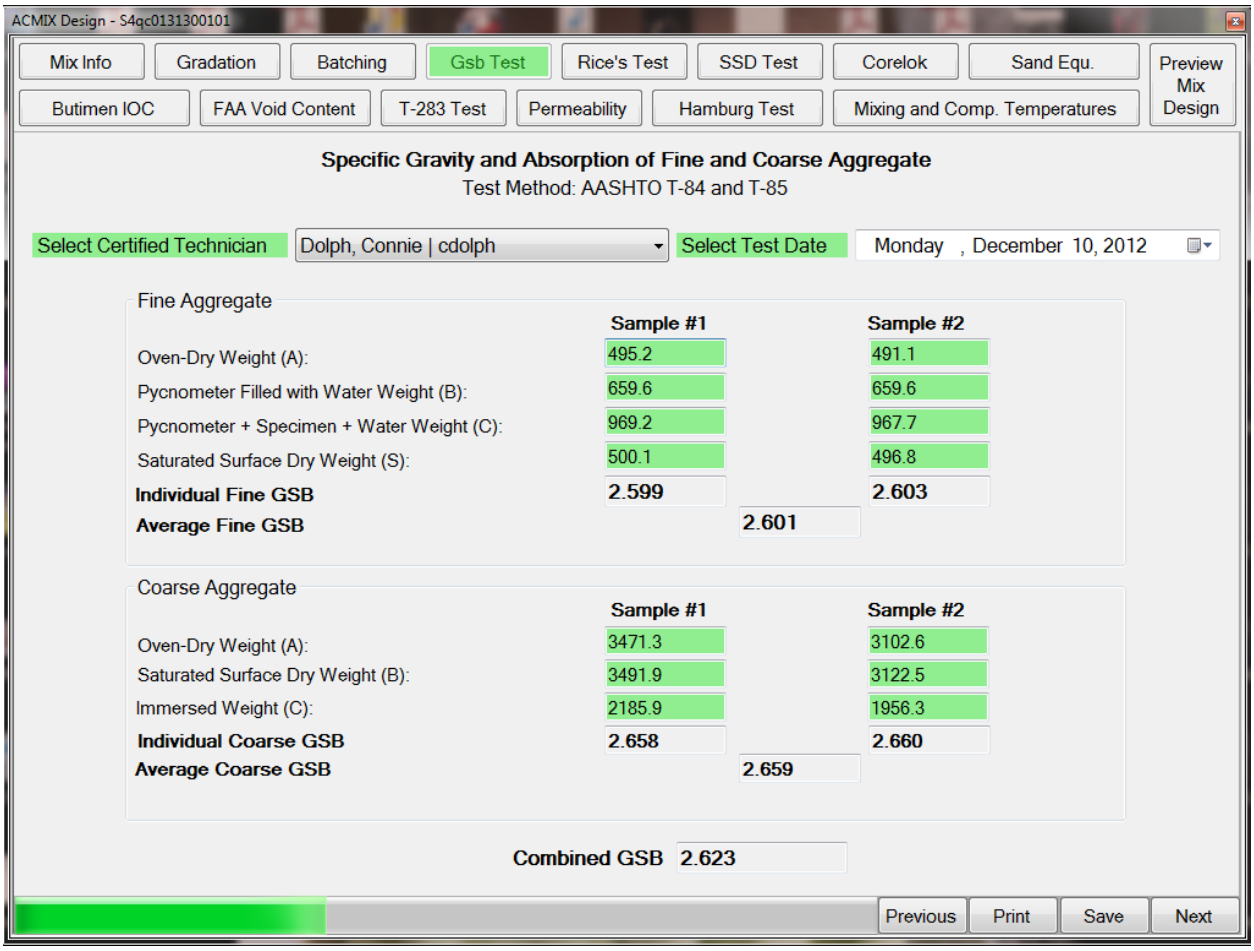


Figure 13. Gsb test tab.

Rice's test tab: Figure 14 shows the Rice's test tab that is used to enter information for test method AASHTO T-209, theoretical maximum specific gravity and density of bituminous paving mixtures standard test.

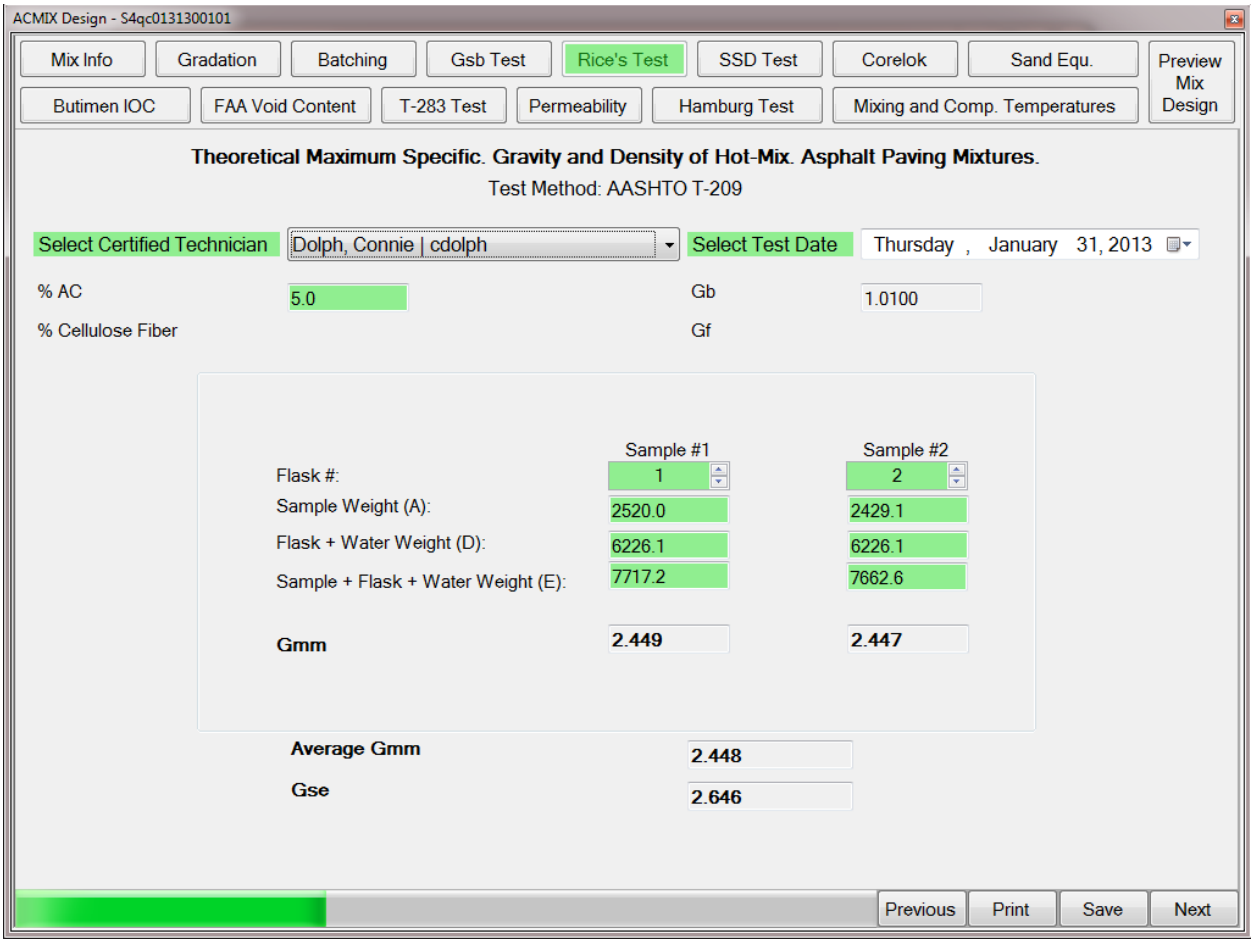


Figure 14. Rice's test tab.

SSD test tab: Figure 15a and 15b show the SSD test tab that is used to enter information for test method OHD L-14, specific gravity and unit weight of compacted bituminous mixtures.

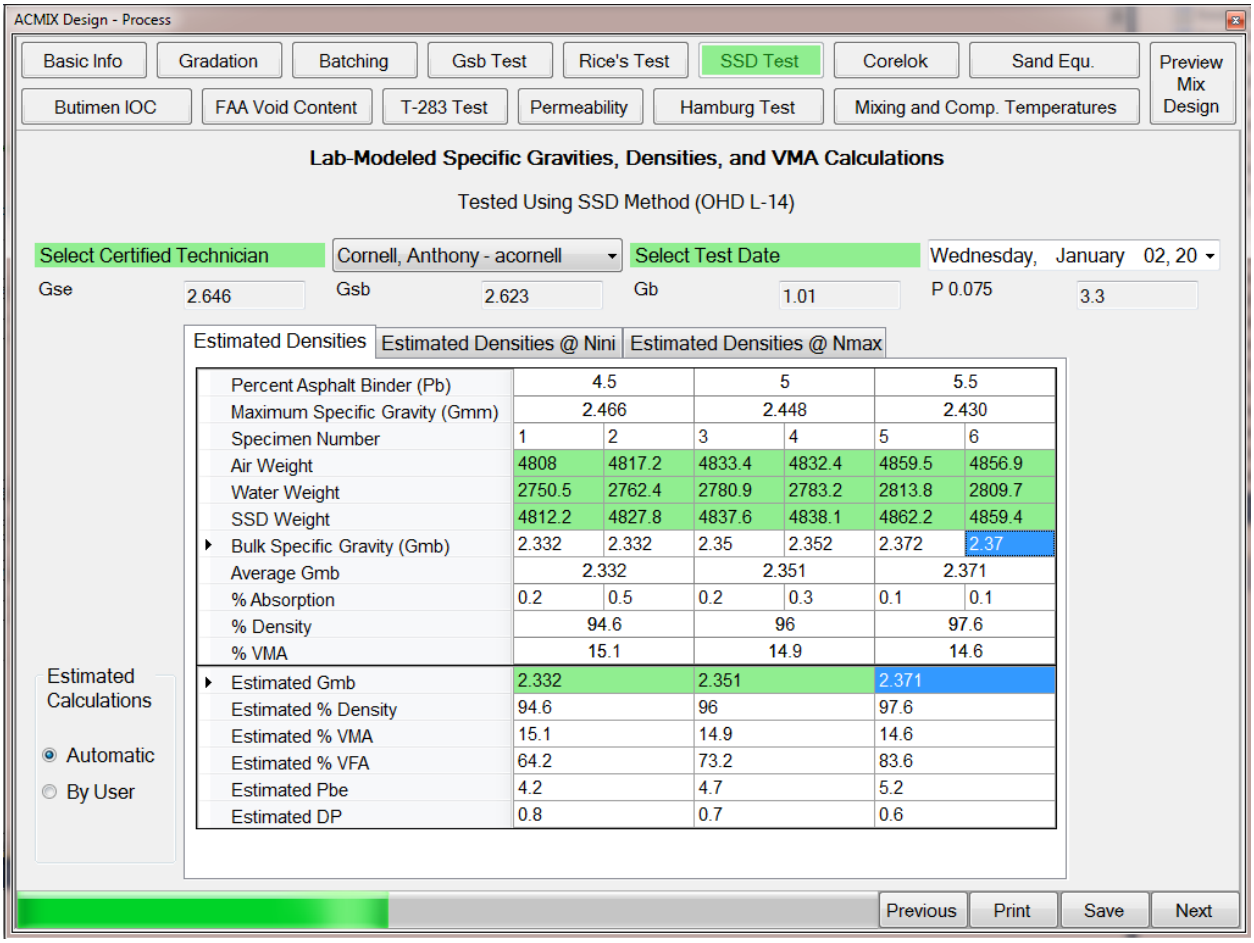


Figure 15a. SSD test tab.

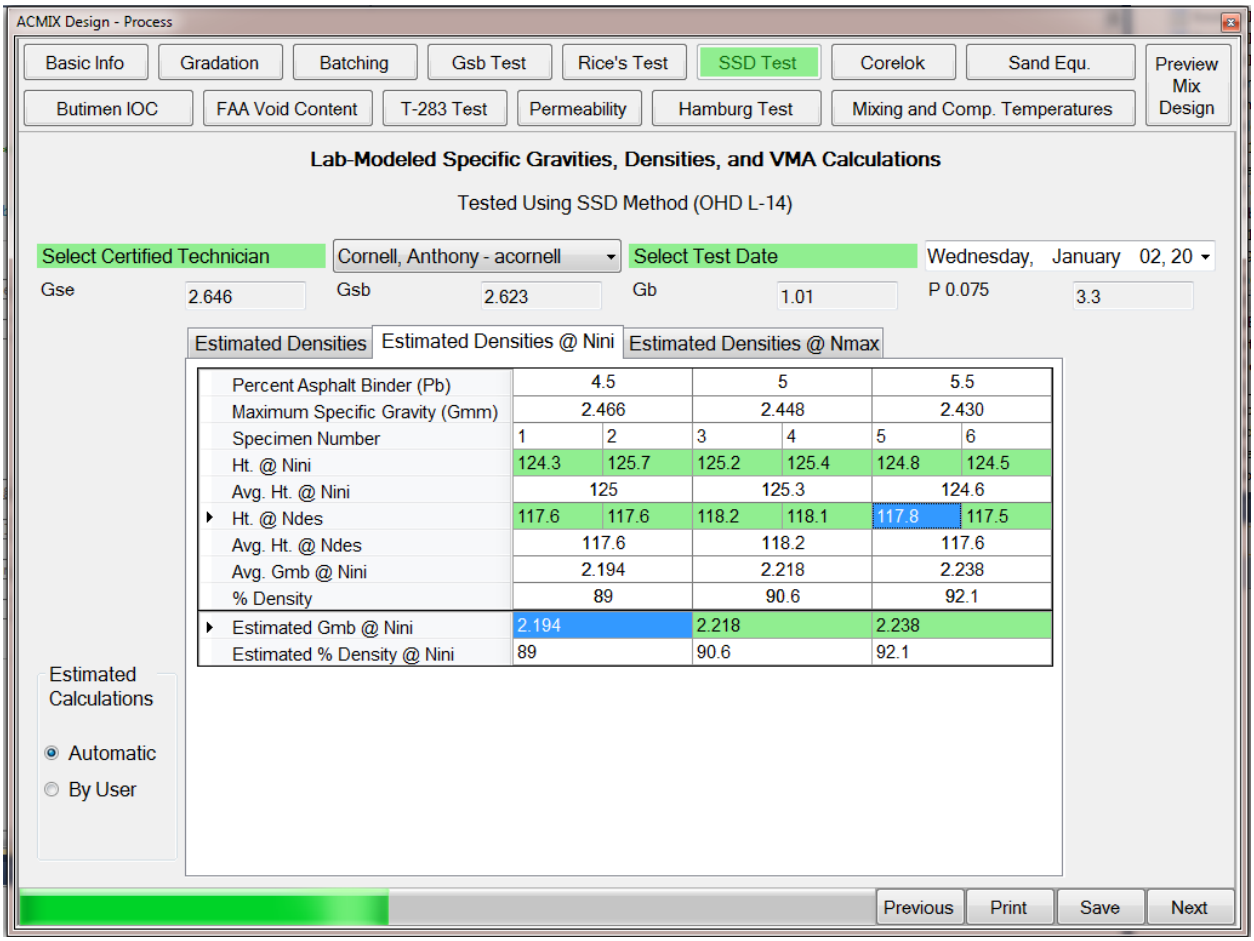


Figure 15b. SSD test tab.

Corelok test tab: Figure 16 shows the Corelok test tab that is used to enter information for test method OHD L-45, specific gravity and unit weight of compacted bituminous mixtures using the CORELOK apparatus.

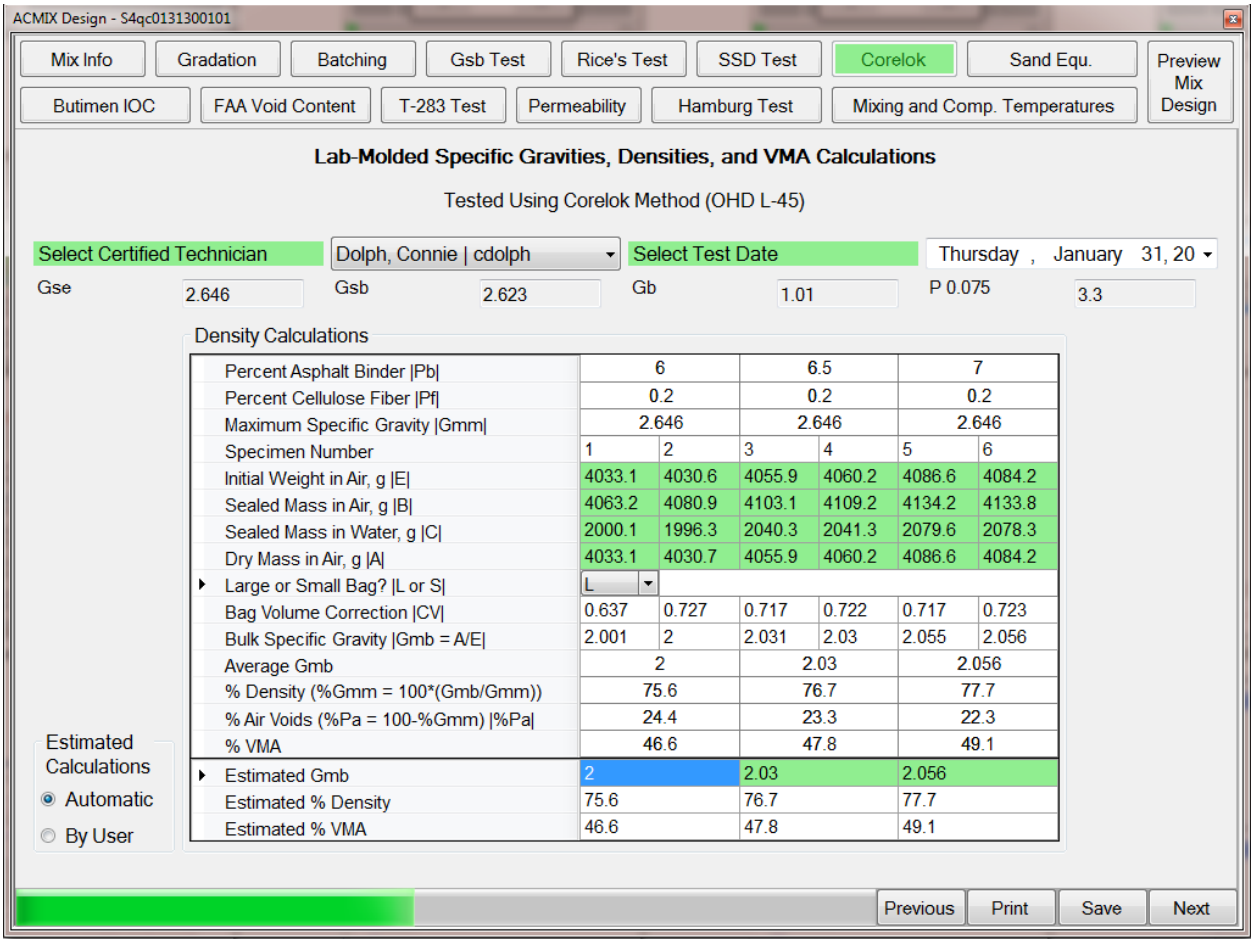


Figure 16. Corelok test tab.

Sand equivalent test tab: Figure 17 shows the sand equivalent test tab that is used to enter information for test method AASHTO T-176, plastic fines in graded aggregates and soils by use of the sand equivalent test.

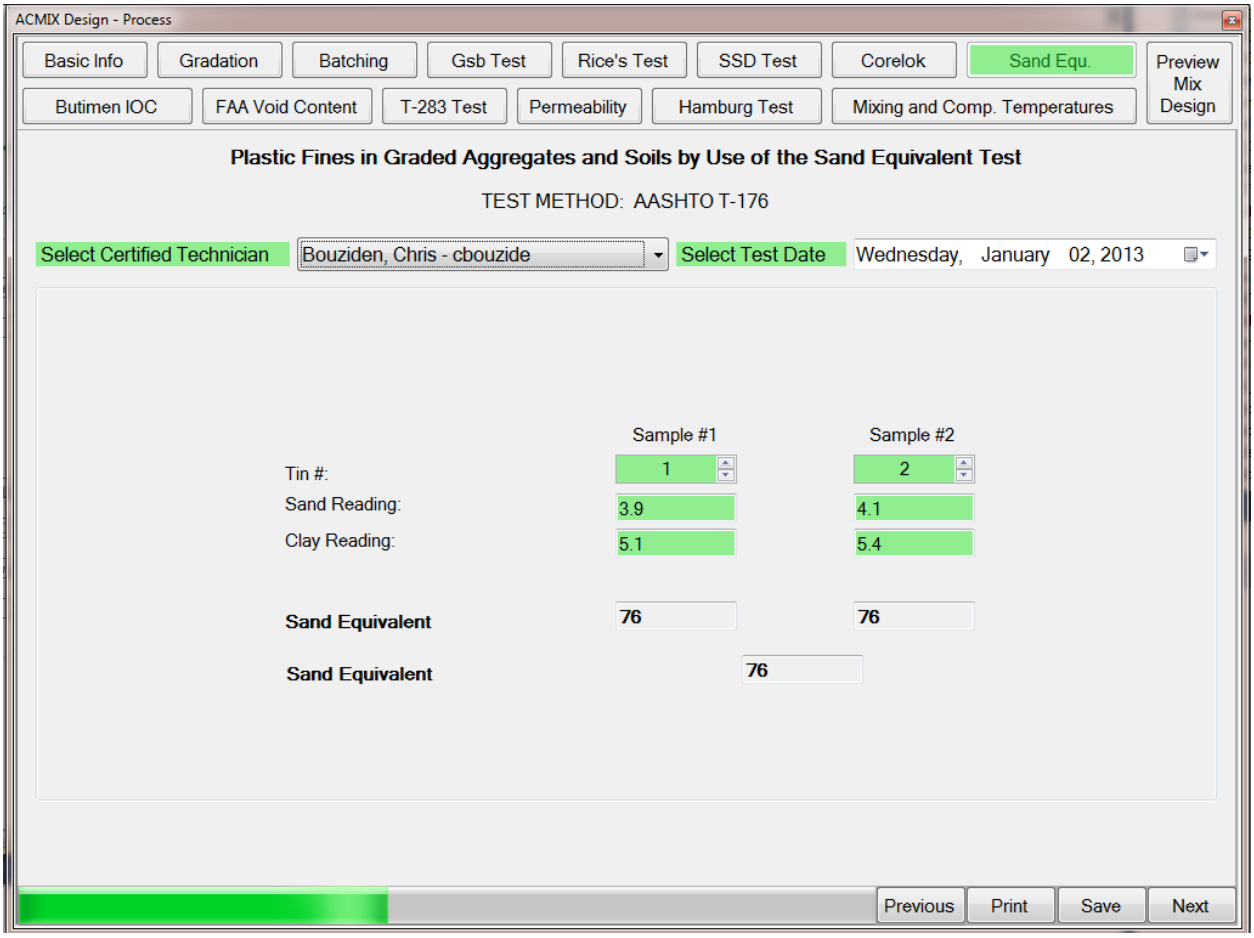


Figure 17. Sand Equivalent test tab

Bitumen IOC test tab: Figure 18 shows the bitumen IOC test tab that is used to enter information for test method OHD L-26, determination of bitumen content in bituminous.

Figure 18. Bitumen IOC test tab.

FAA void content tab: Figure 19 shows the FAA void content tab that is used to enter information for test method AASHTO T-304, uncompacted void content of fine aggregate.

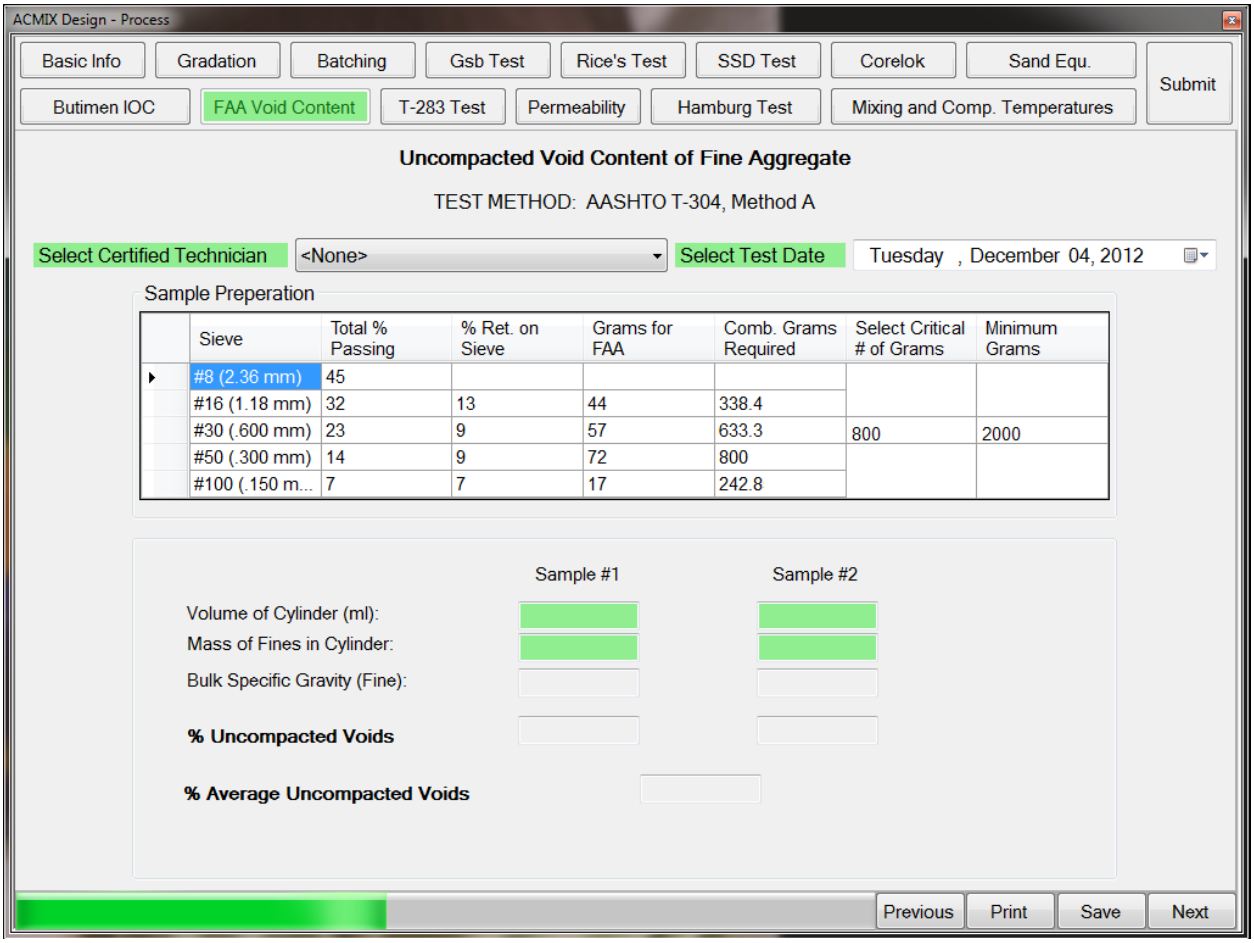


Figure 19. FAA void content tab.

T-283 test tab: Figure 20 shows the T-283 test tab that is used to enter information for test method AASHTO T-283, resistance of compacted bituminous mixture to moisture-induced damage.

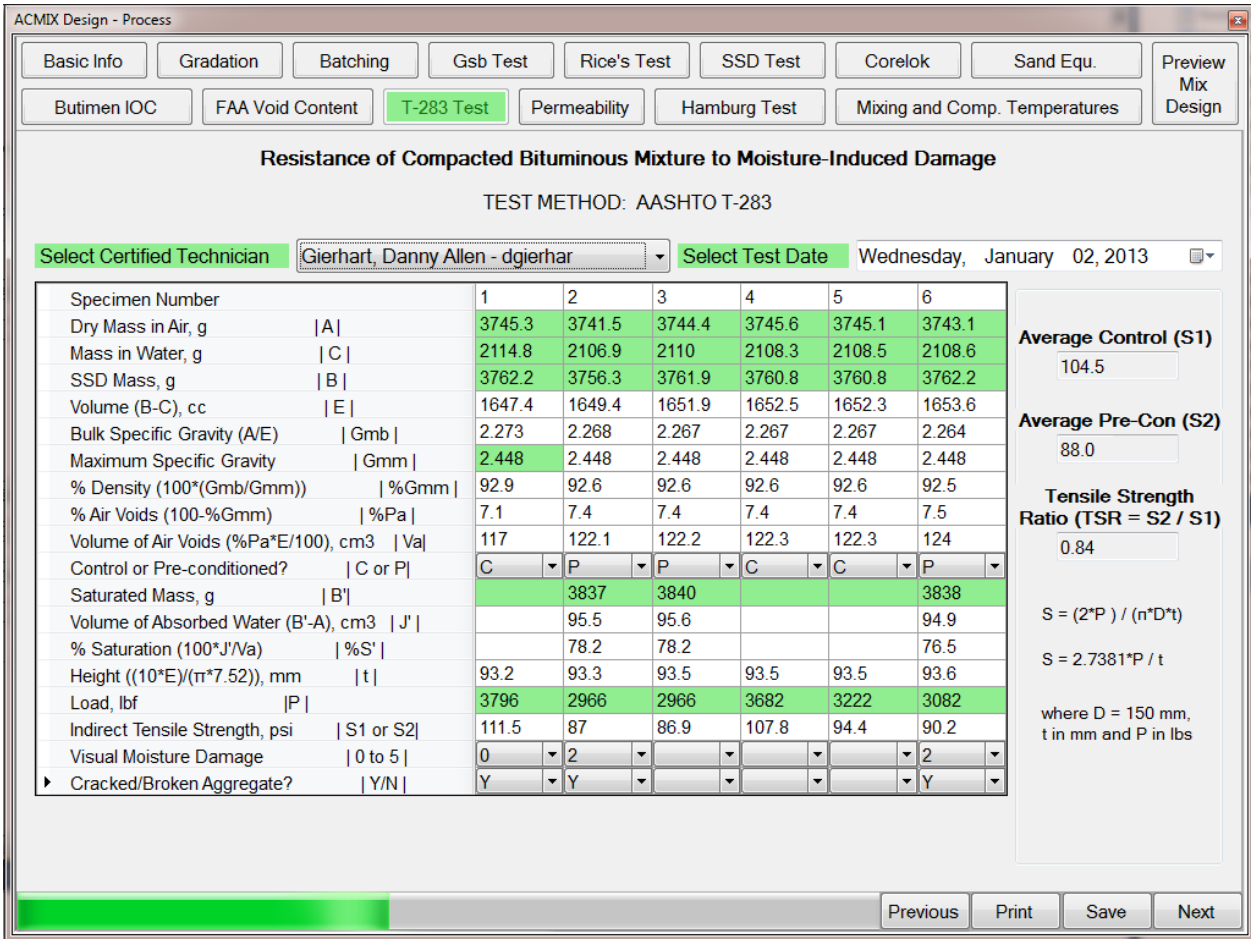


Figure 20. T-283 Test tab.

Permeability test tab: Figure 21 shows the permeability test tab that is used to enter information for test method OHD L-44, measurement of water permeability on compacted paving mixtures.

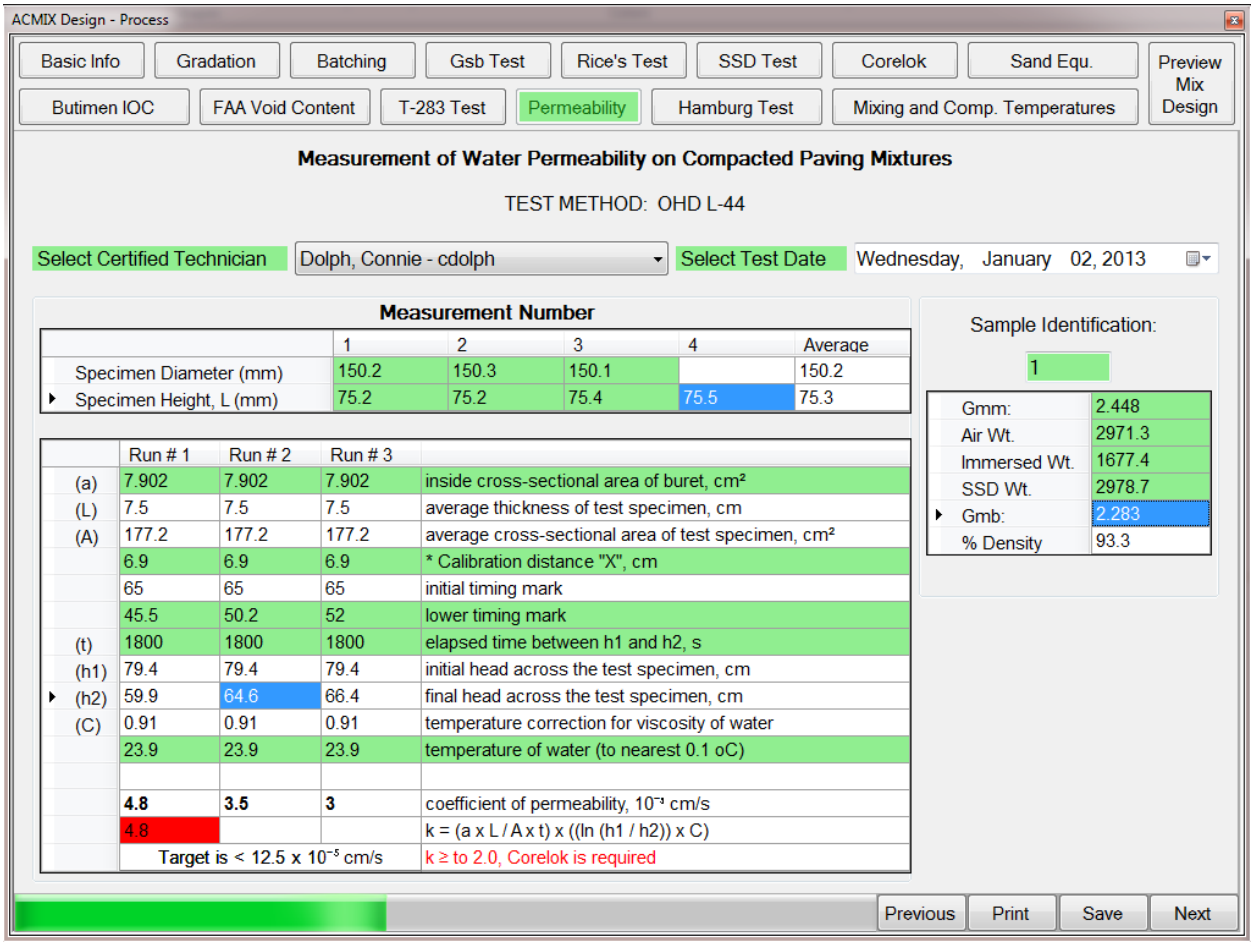


Figure 21. Permeability Test tab.

Hamburg rut test: Figure 22 shows the Hamburg rut test tab that is used to enter information for test method OHD L-55, Hamburg rut testing of compacted Hot Mix Asphalt (HMA).

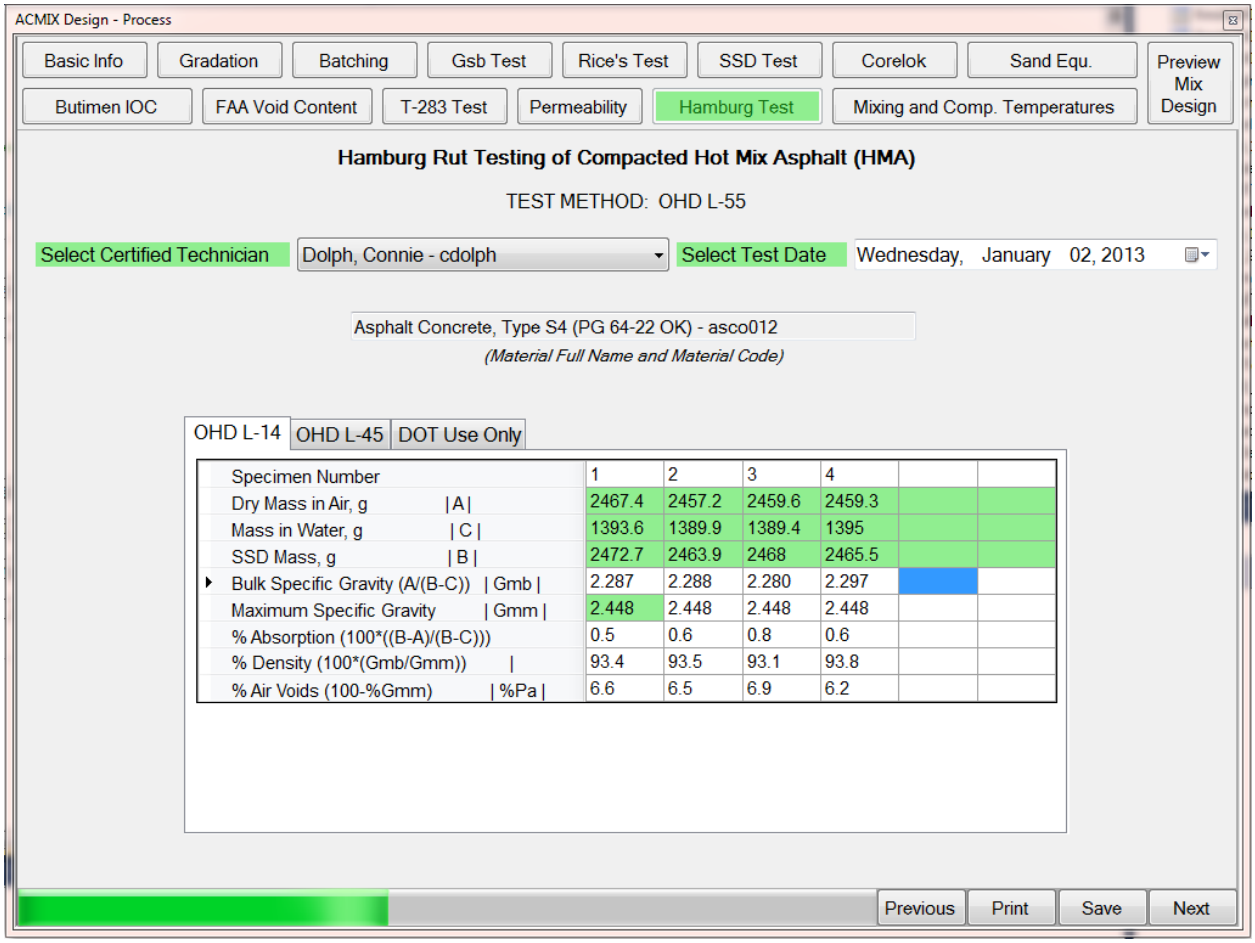


Figure 22. Hamburg rut test.

Mixing and compaction temperatures tab: Figure 23 shows the mixing and compaction temperatures tab that is used to enter information about the temperature limits based on the selected mix type.

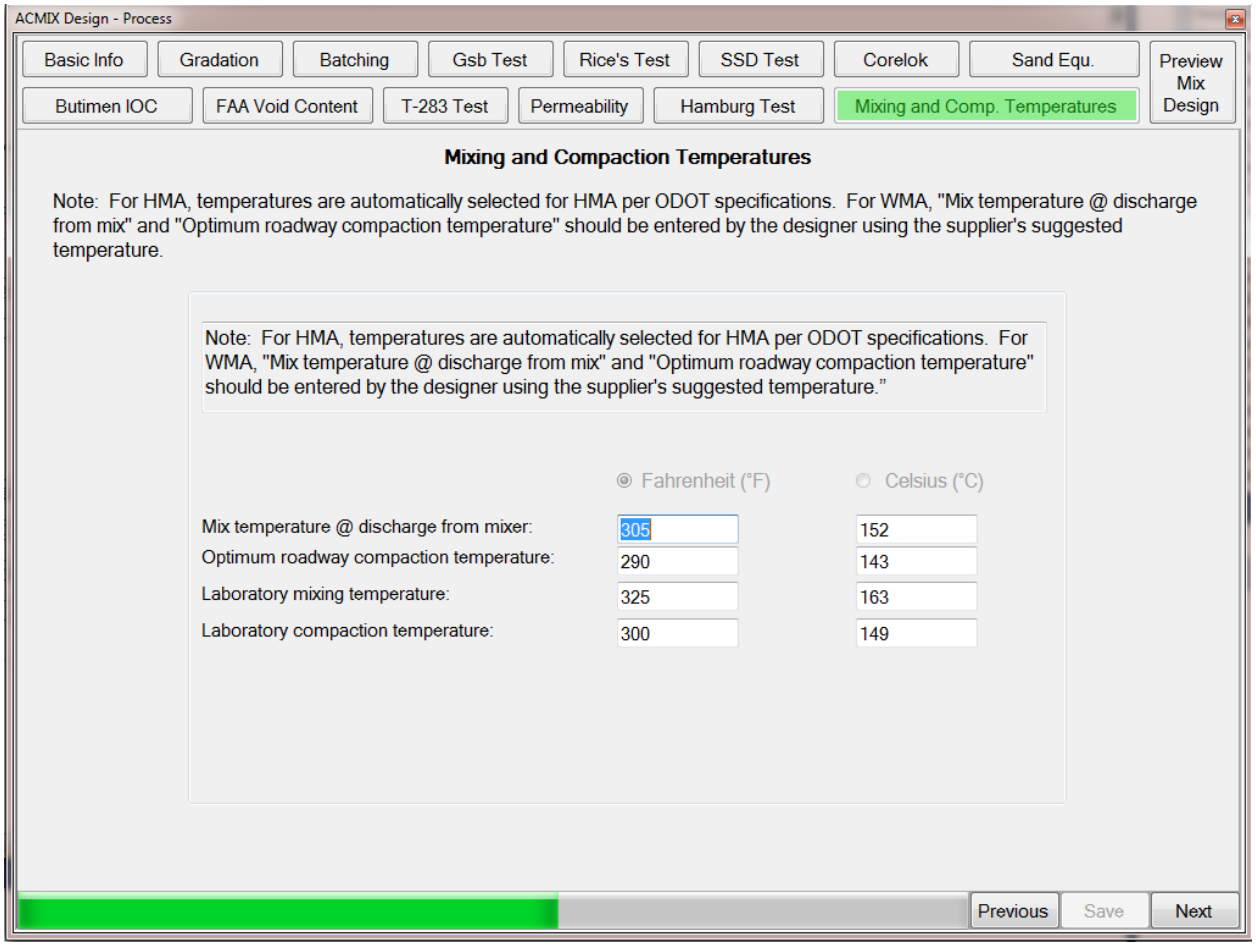


Figure 23. Mixing and Compaction Temperatures tab.

Mix review and submittal form: at any time during the mix design process, the user has access to a summary that shows the final submittal form with limits and requirements (see Figures 24 and 25). The final submittal form is accessible using the "Preview Mix Design" button on any mix design tab (see Figure 10 to 23).

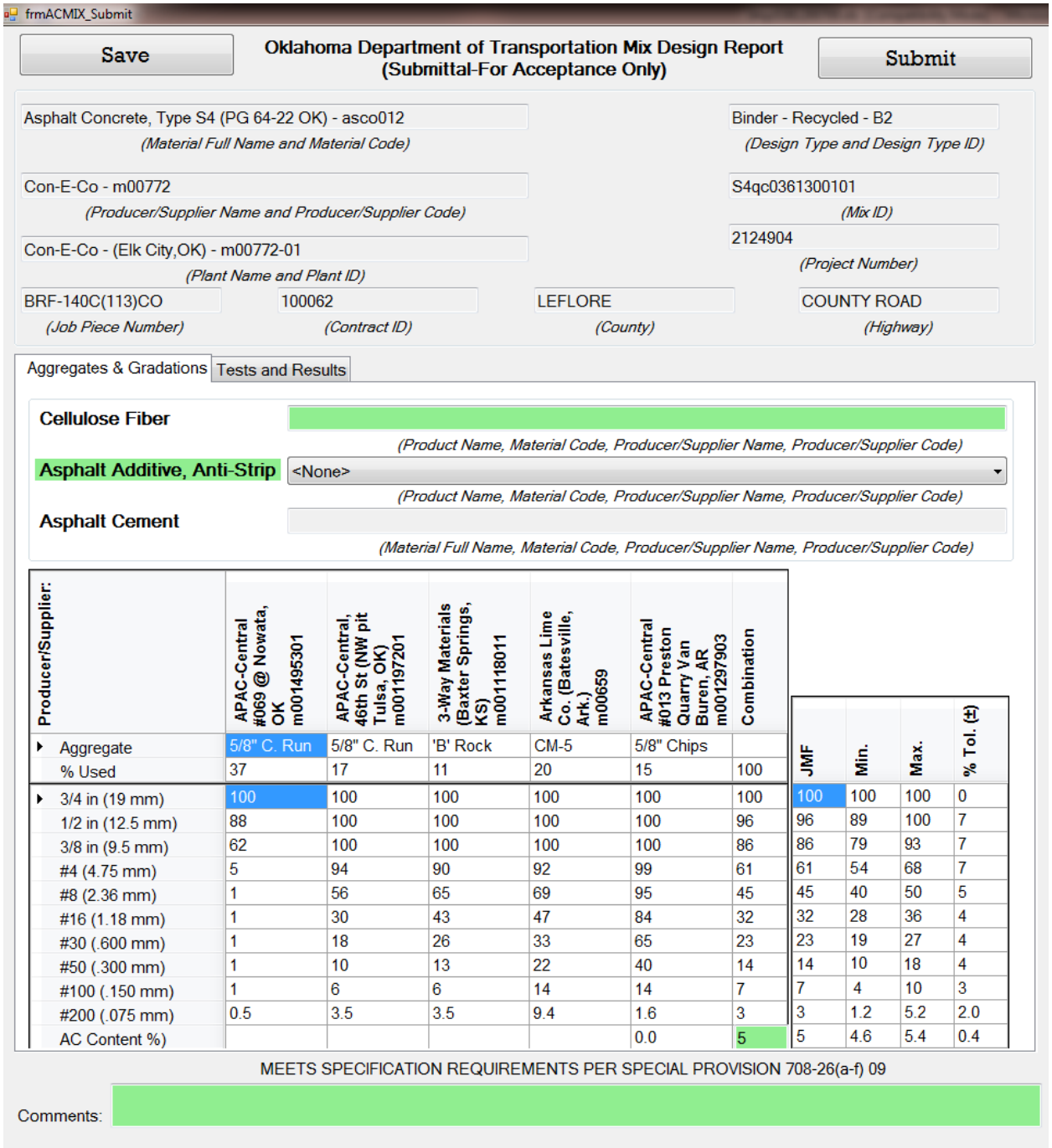


Figure 24. Mix review and submittal form.

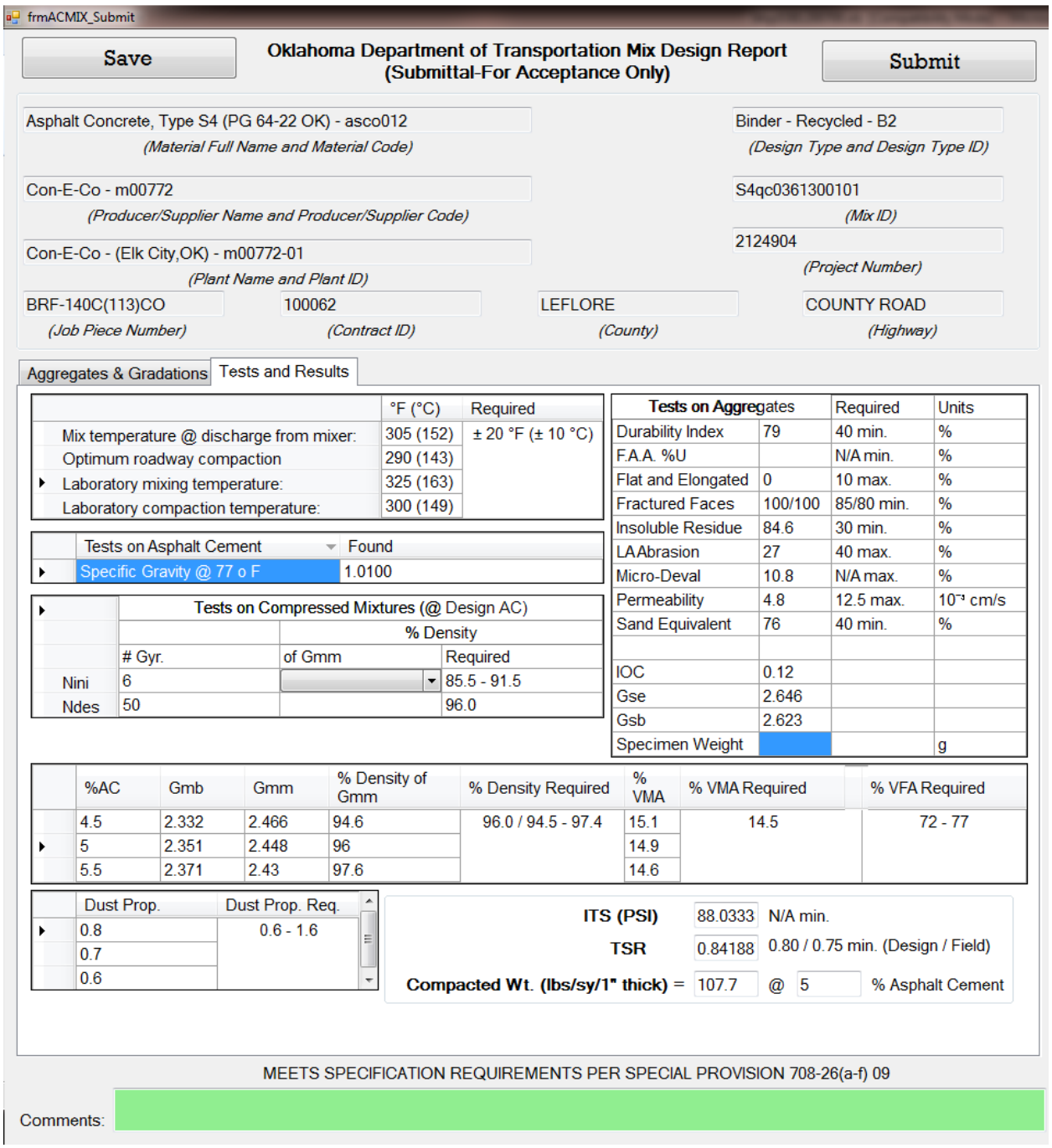


Figure 25. Mix review and submittal form.

Print and print preview functionality: at any time during the mix design process, the user can print one or several tabs or forms of the mix design program (see Figure 26). The print form is accessible using the “Print” button on any mix design tab (see Figure 10 to 23).

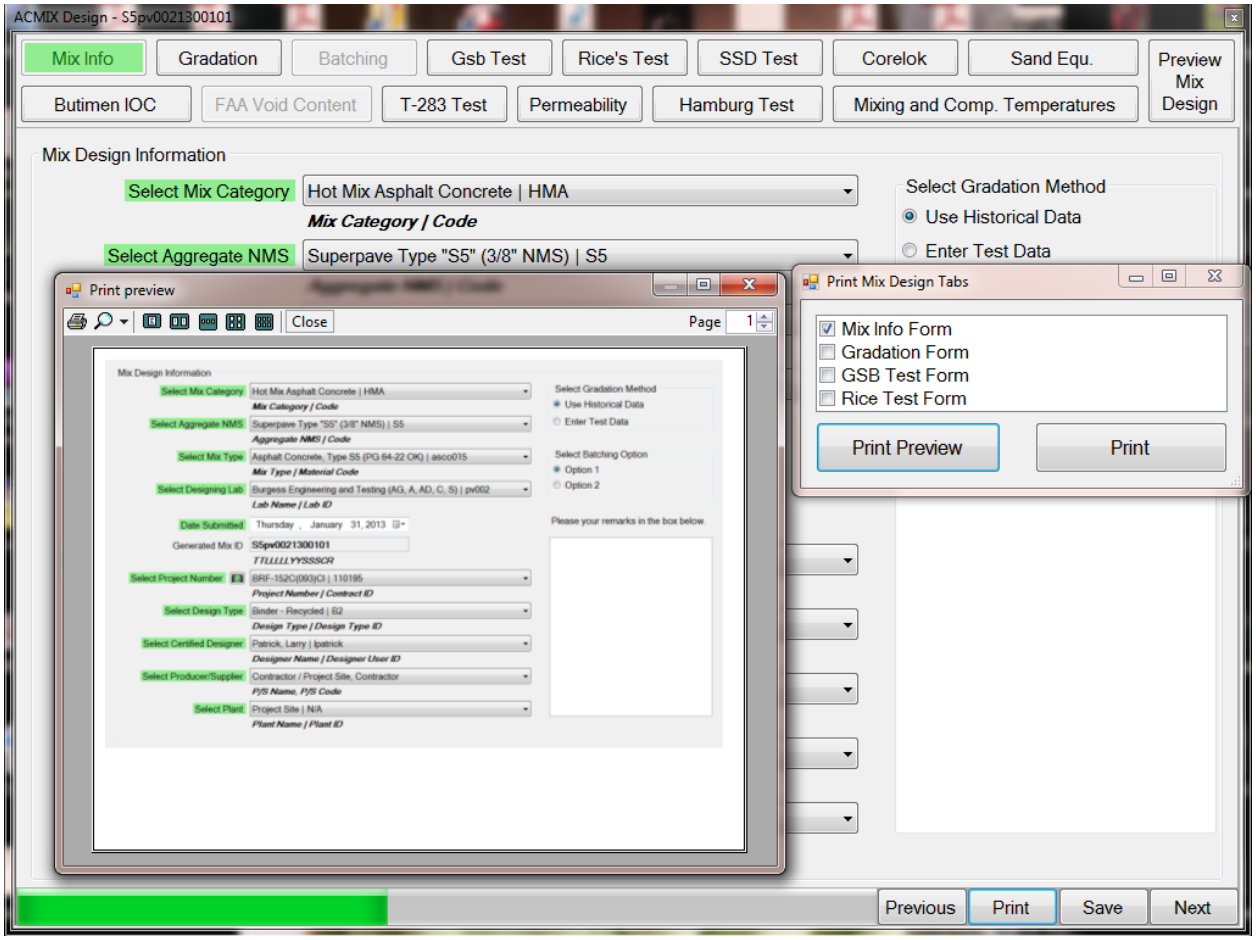


Figure 26. Print and print preview functionality.

7. Conclusions

During this one-year project, a database-driven Windows Application based system was developed to replace the existing Excel-based software that is used by ODOT for asphalt mix design. The new mix design system uses a centralized database approach for increased security, ease of maintenance, upgrades, and backups. The software allows for multiple users from remote locations to simultaneously create and validate mix designs over the internet. In addition, using 2010 Microsoft Visual Studio simplifies future revisions and maintenance of the software. The new mix design software is expected to increase productivity and user satisfaction of both ODOT engineers and the contractors.

8. References

[1] American Association of State Highways and Transportation Officials (2007). Superpave Volumetric Mix Design. AASHTO M323-07, Washington, D.C.

[2] Asphalt Institute. (2001). Superpave Mix Design. Superpave Series No. 2 (SP-02). Asphalt Institute. Lexington, KY.

[3] Cominsky, R., Huber, G.A., Kennedy, T.W., and Anderson, M. (1994), SHRP A-407. The Superpave Mix Design Manual for New Construction and Overlays, Strategic Highway Research Program, National Research Council, Washington, D.C.

[4] Kennedy, T.W., Huber, G.A., Harrigan, E.T., Cominsky, R.J., Hughes, C.S., Quintus, H.V., and Moulthrop, J.S. (1994). Superior Performing Asphalt Pavements (Superpave): The Product of the SHRP Asphalt Research Program. SHRP-A-410, National Research Council, Washington, D.C.

[5] Kentucky Department of Transportation (KYDOT) (2011). Superpave Mix Design Program. http://transportation.ky.gov/materials/SiteManager.htm (Last accessed: April 20, 2011).

[6] McGennis, R.B., Anderson, R.M., Kennedy, T.W. and Solaimanian, M. (1995). Background of Superpave Asphalt Mixture Design and Analysis, Pub. No. FHWA-SA-95-003.

[7] National Asphalt Pavement Association. (1982). Development of Marshall Procedures for Designing Asphalt Paving Mixtures, Information Series 84. National Asphalt Pavement Association. Lanham, MD.

[8] North Carolina Department of Transportation (NCDOT). Superpave Mix Design Spreadsheets. http://www.ncdot.org/doh/operations/dp_chief_eng/constructionunit/paveconst/Asphat_Mgmt/spave/spave0.htm (Last accessed: April 22, 2011)

[9] Oklahoma Department of Transportation (ODOT) (2011). Superpave Mix Design. Oklahoma. http://www.okladot.state.ok.us/materials/acmixportal.htm (Last accessed: March 22, 2011).

[10] Pennsylvania Asphalt Pavement Associations (PAPA, 2011). PA Superpave Mix Design Software. http://www.pahotmix.org/PA_Superpave.asp (Last accessed: April 26, 2011).

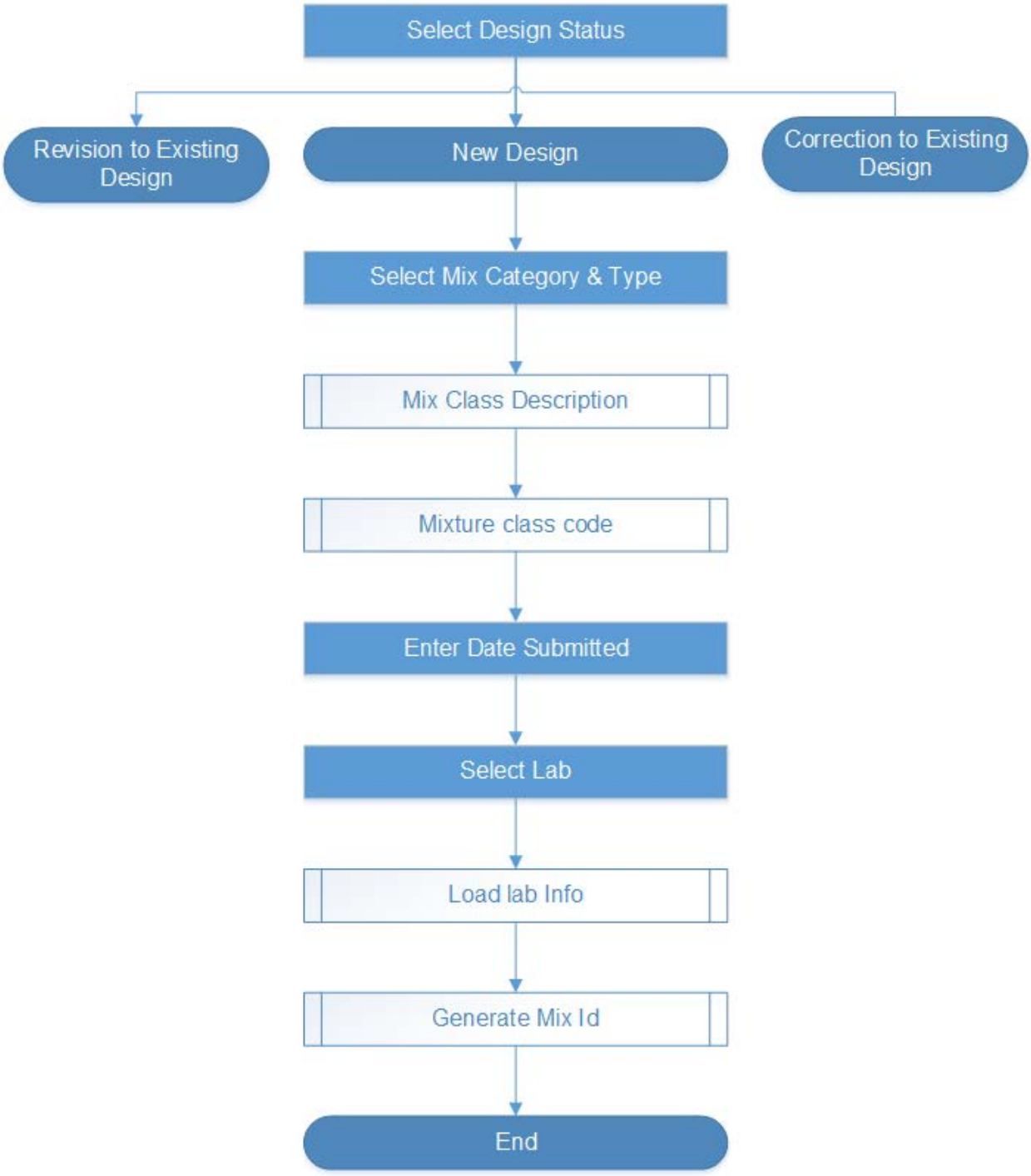
[11] Roberts, F.L.; Kandhal, P.S.; Brown, E.R.; Lee, D.Y. and Kennedy, T.W. (1996). Hot Mix Asphalt Materials, Mixture Design, and Construction. National Asphalt Pavement Association Education Foundation. Lanham, MD.

[12] Tia, M. (2005). Fundamentals and Practice of Asphalt Mixture Design Procedures to Assure Adequate Performance. Proceeding, 13th Conference on Pavement Engineering, Hsin Chu, Taiwan, pp.1-19.

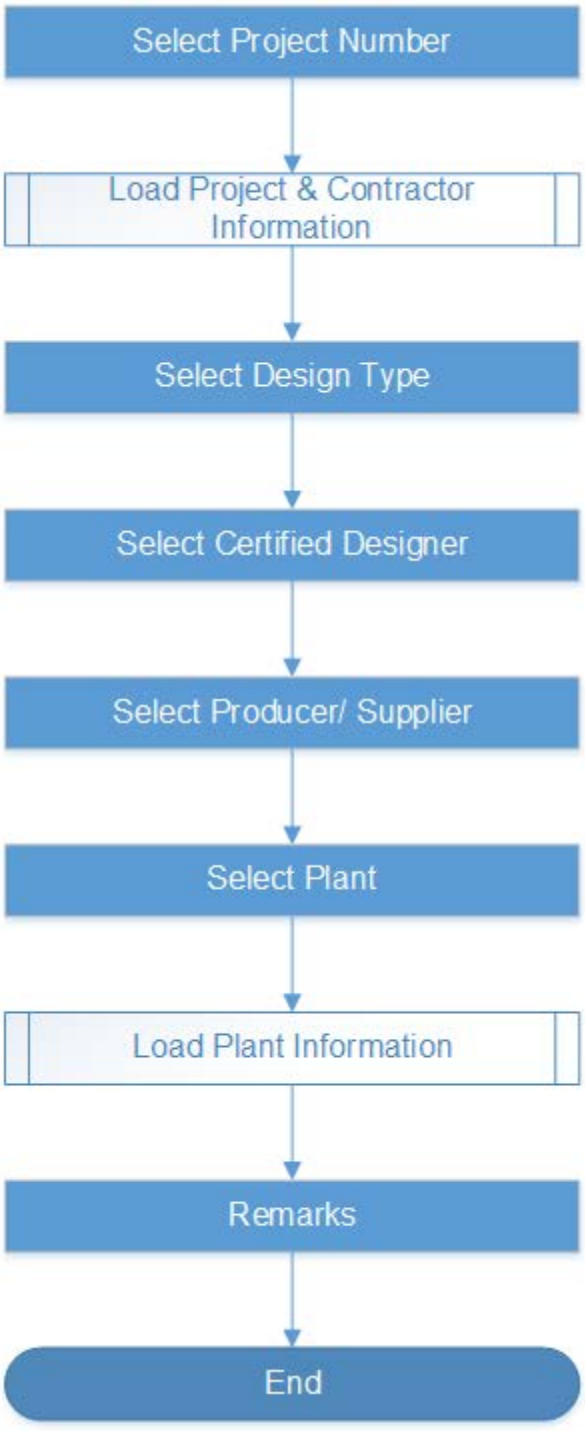
[13] Zaniewski, J. P., and Padula, M. (2003). Automation of the Superpave Mix Design Process for the West Virginia Division of Highways. West Virginia Division of Highways, Charleston, WV.

Appendix A: Detailed Flowcharts of Mix Design Tabs

Mix ID Generation:

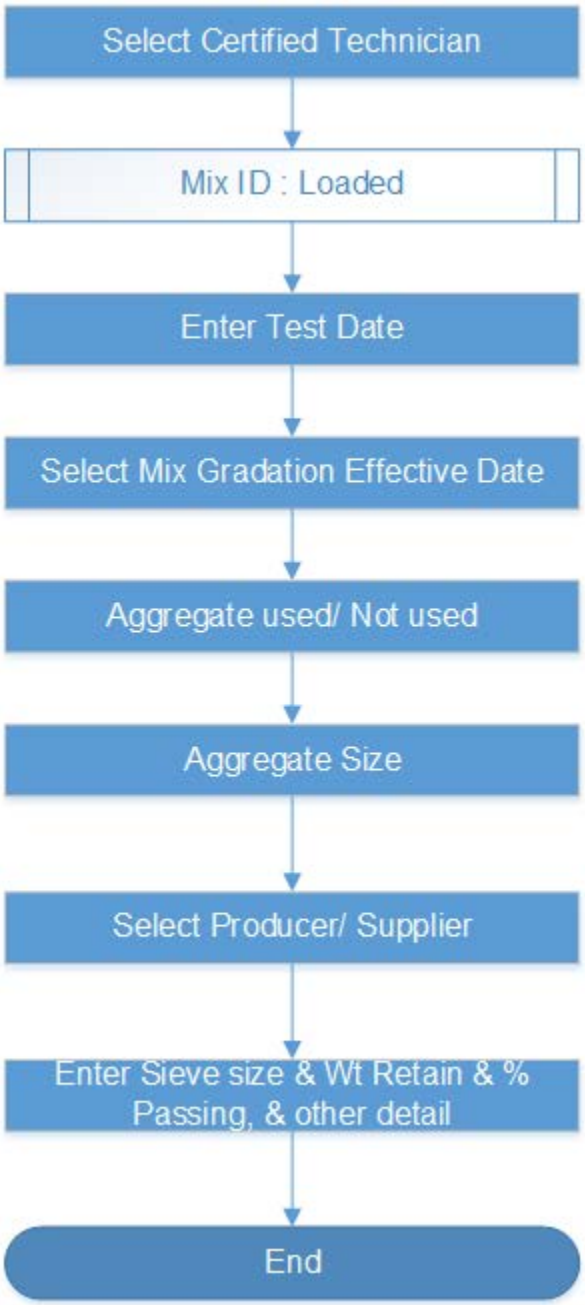


Remarks & Information:

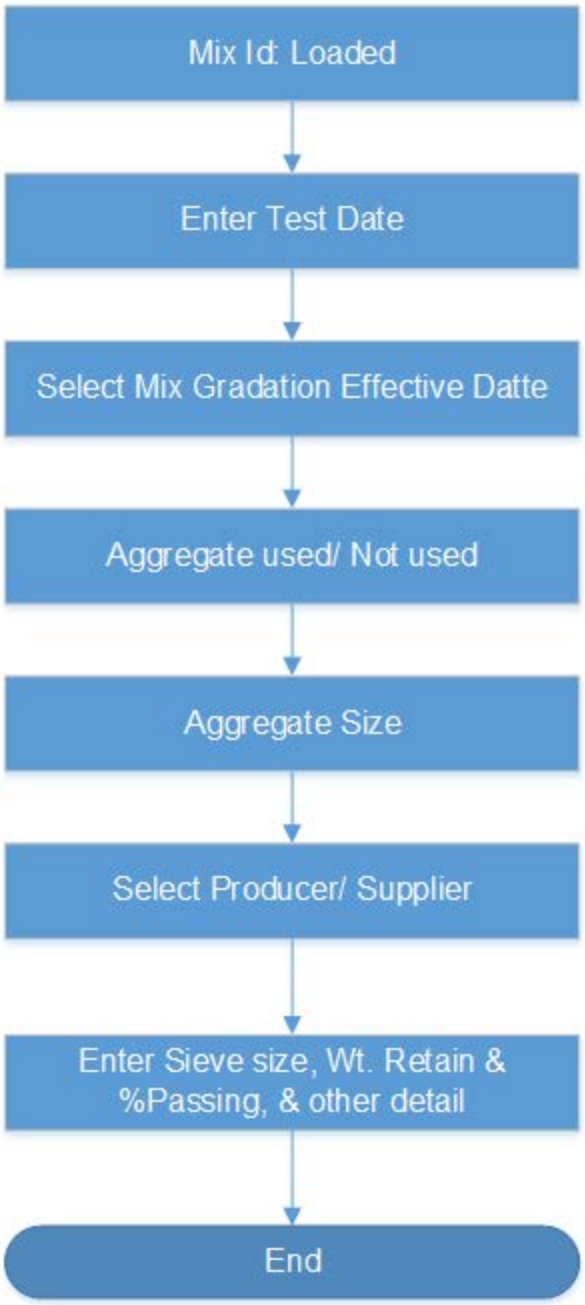


Select Gradation Option:

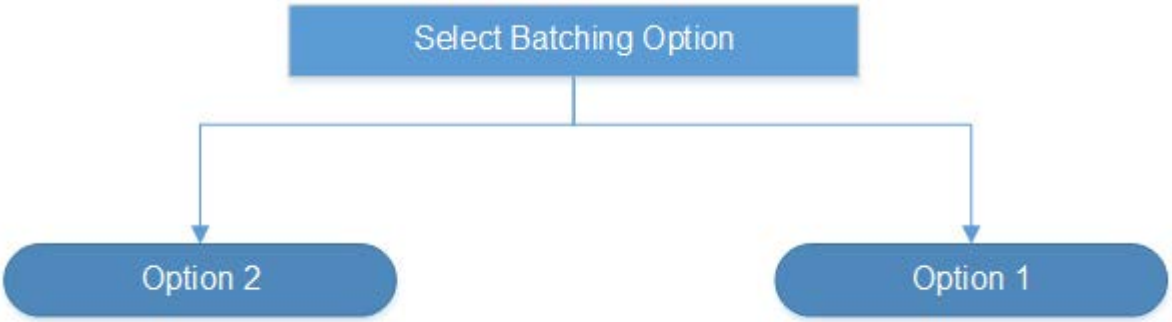
Gradations Enter Test data:



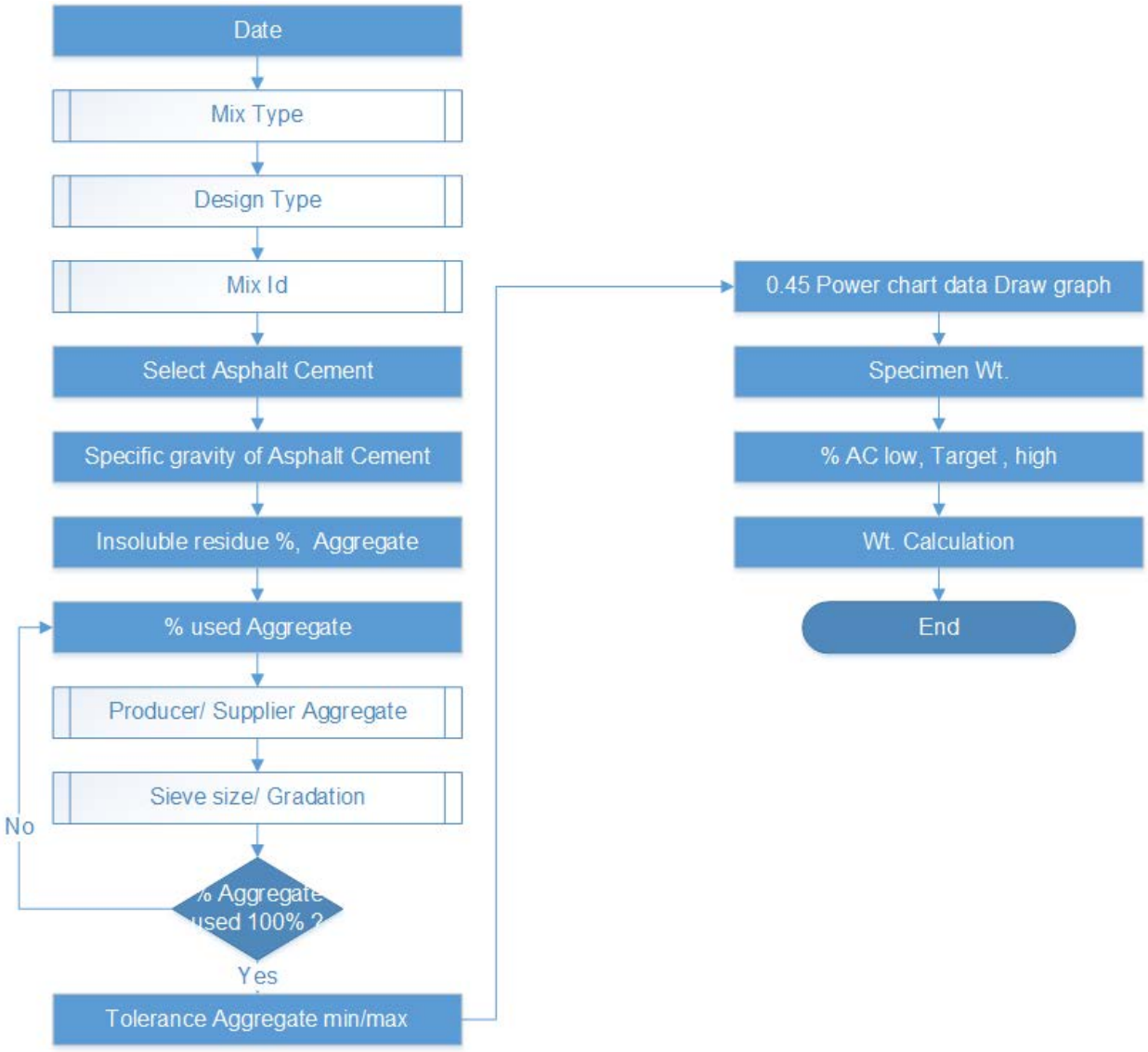
Gradations Hist. Averages:



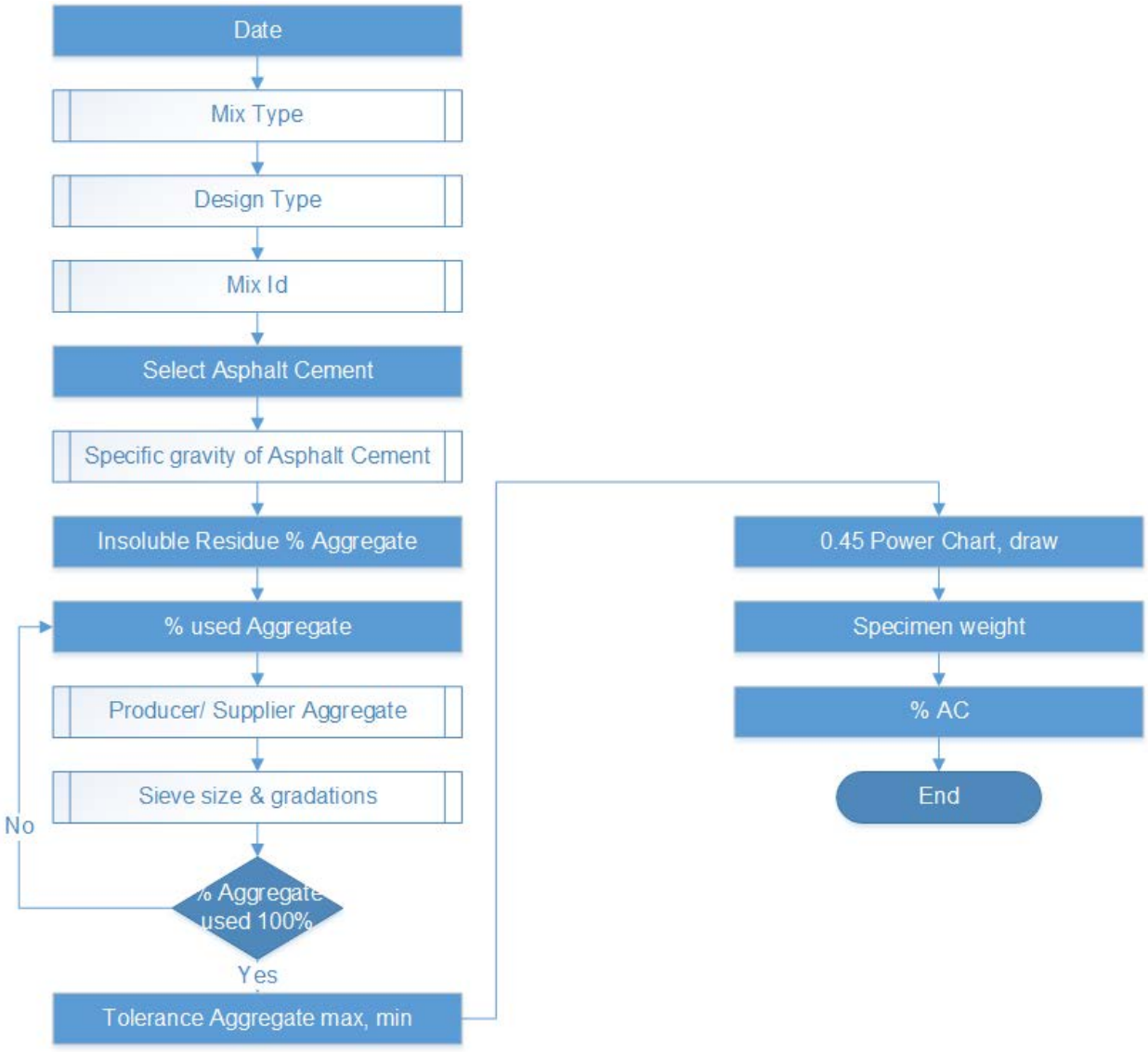
Select Batching Option:



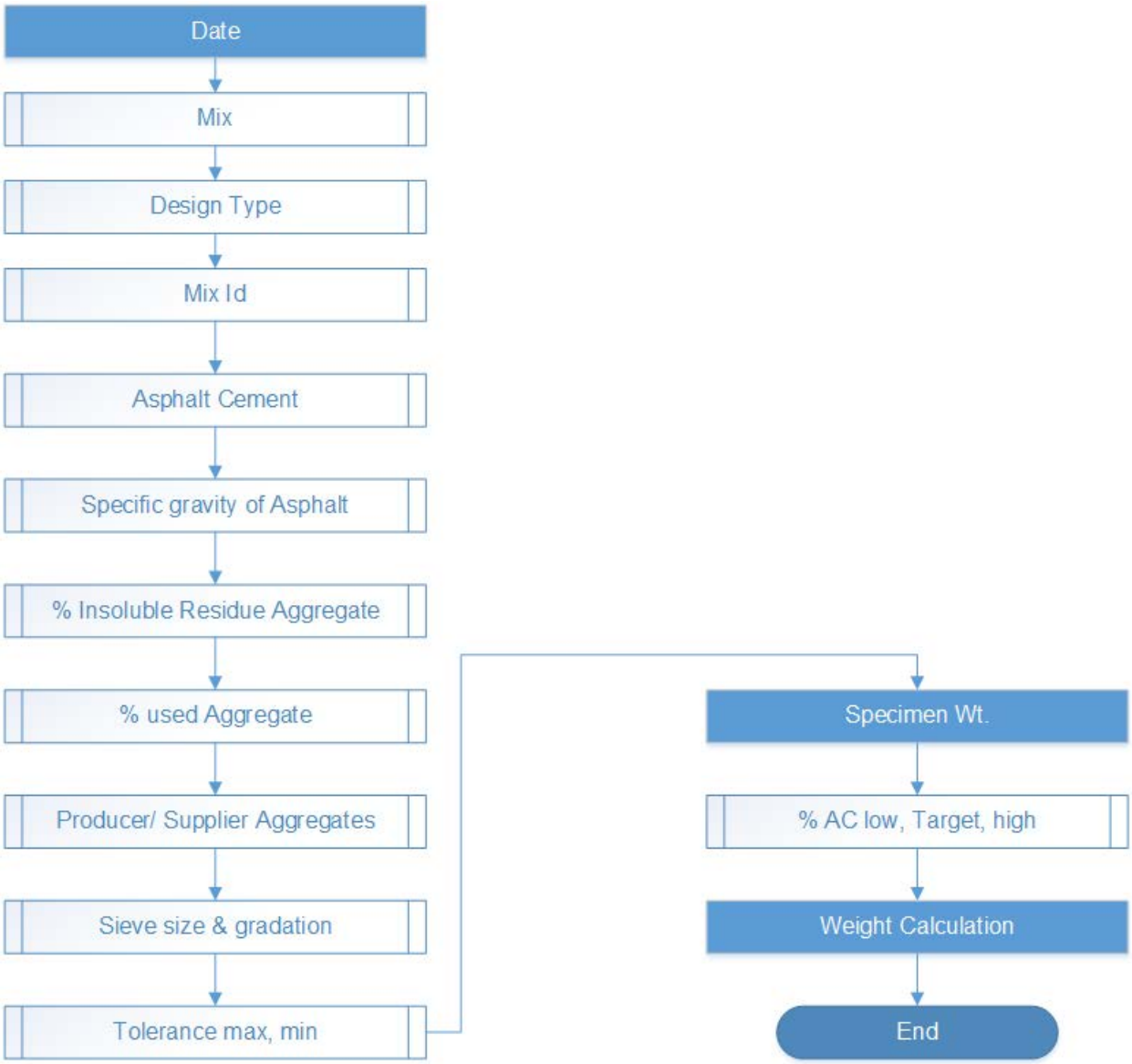
Initial Batching Option-1:



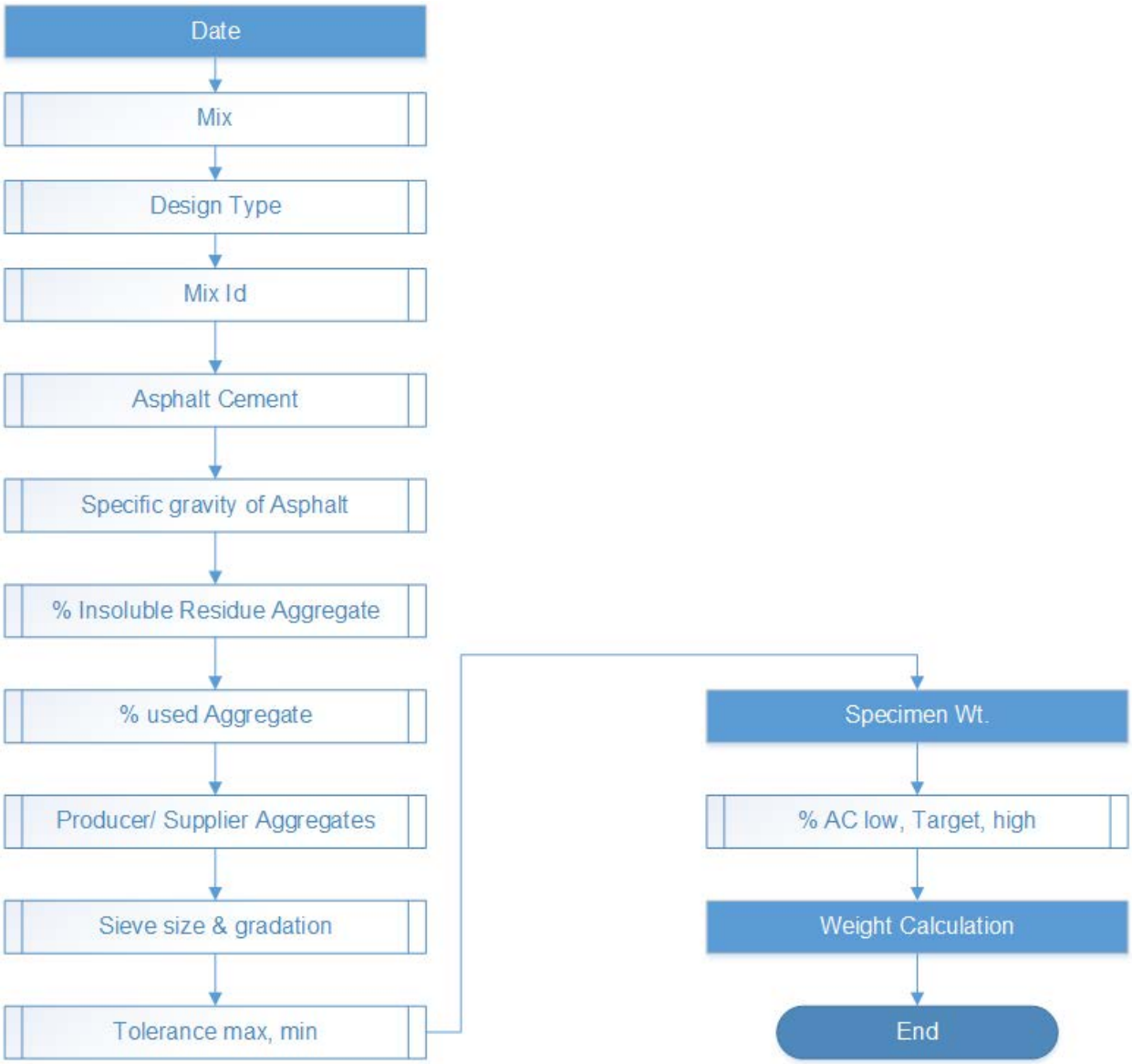
Initial Batching Option-2:



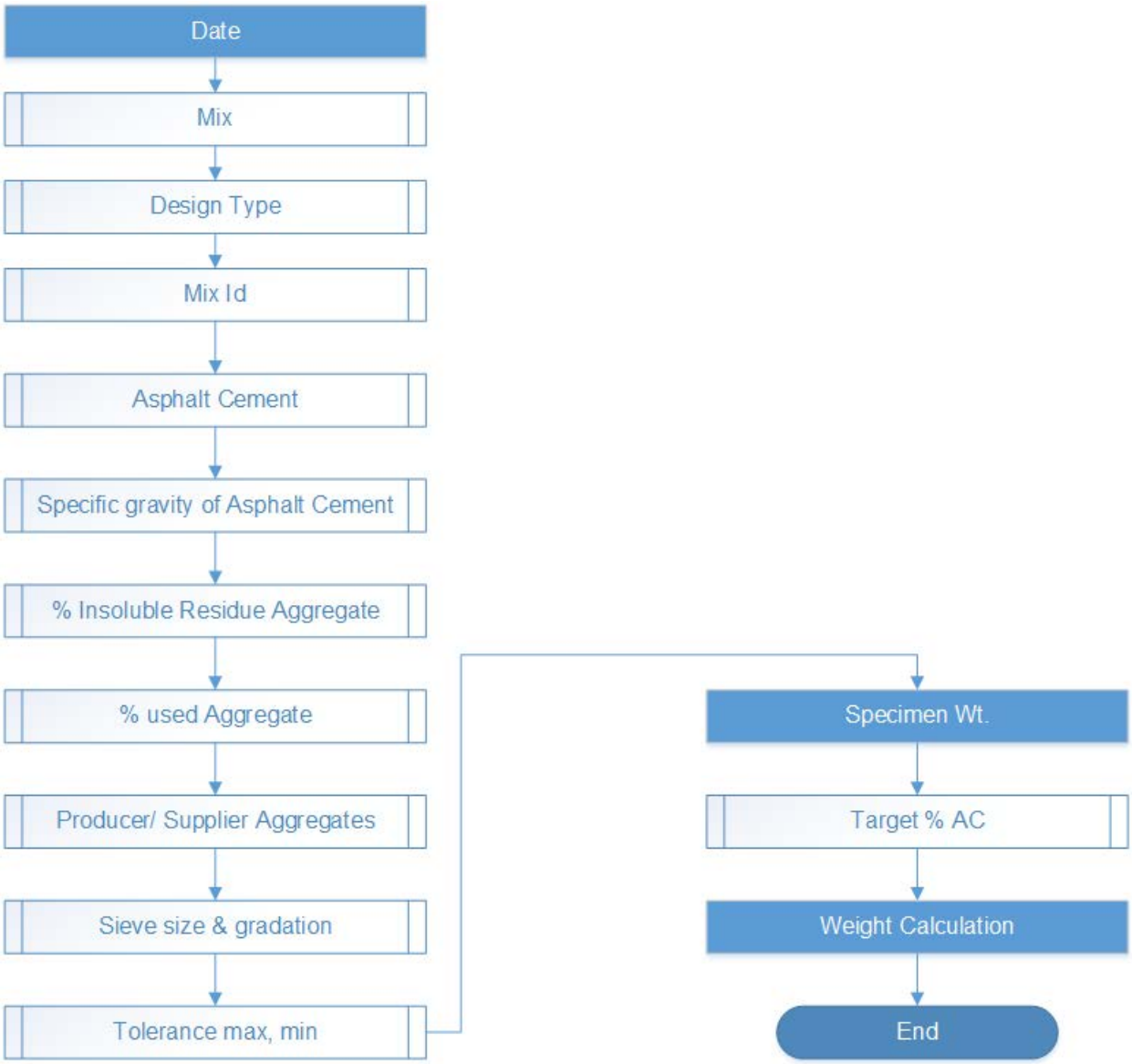
Nmax Batching Option-1:



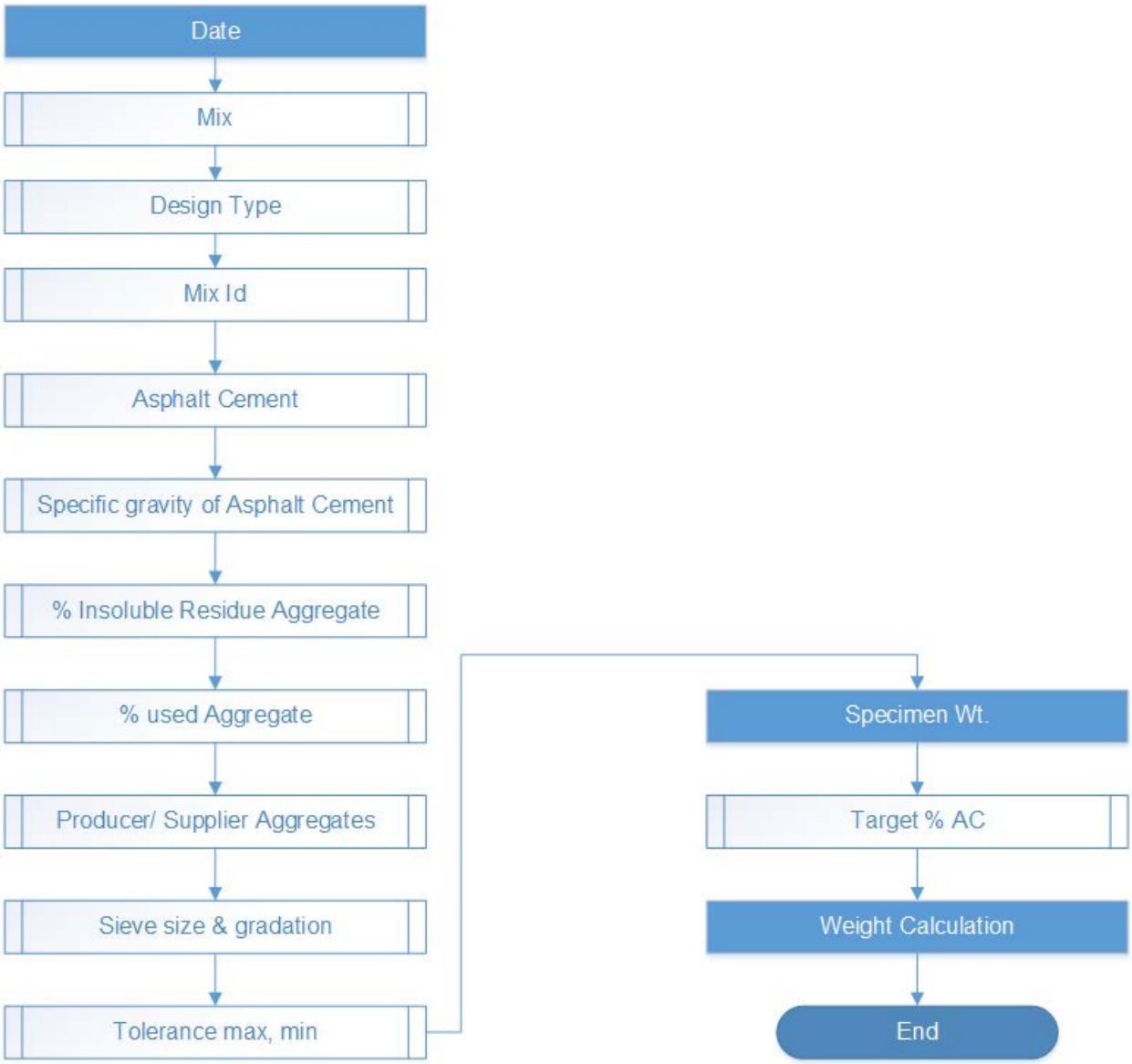
Nmax Batching Option-2:



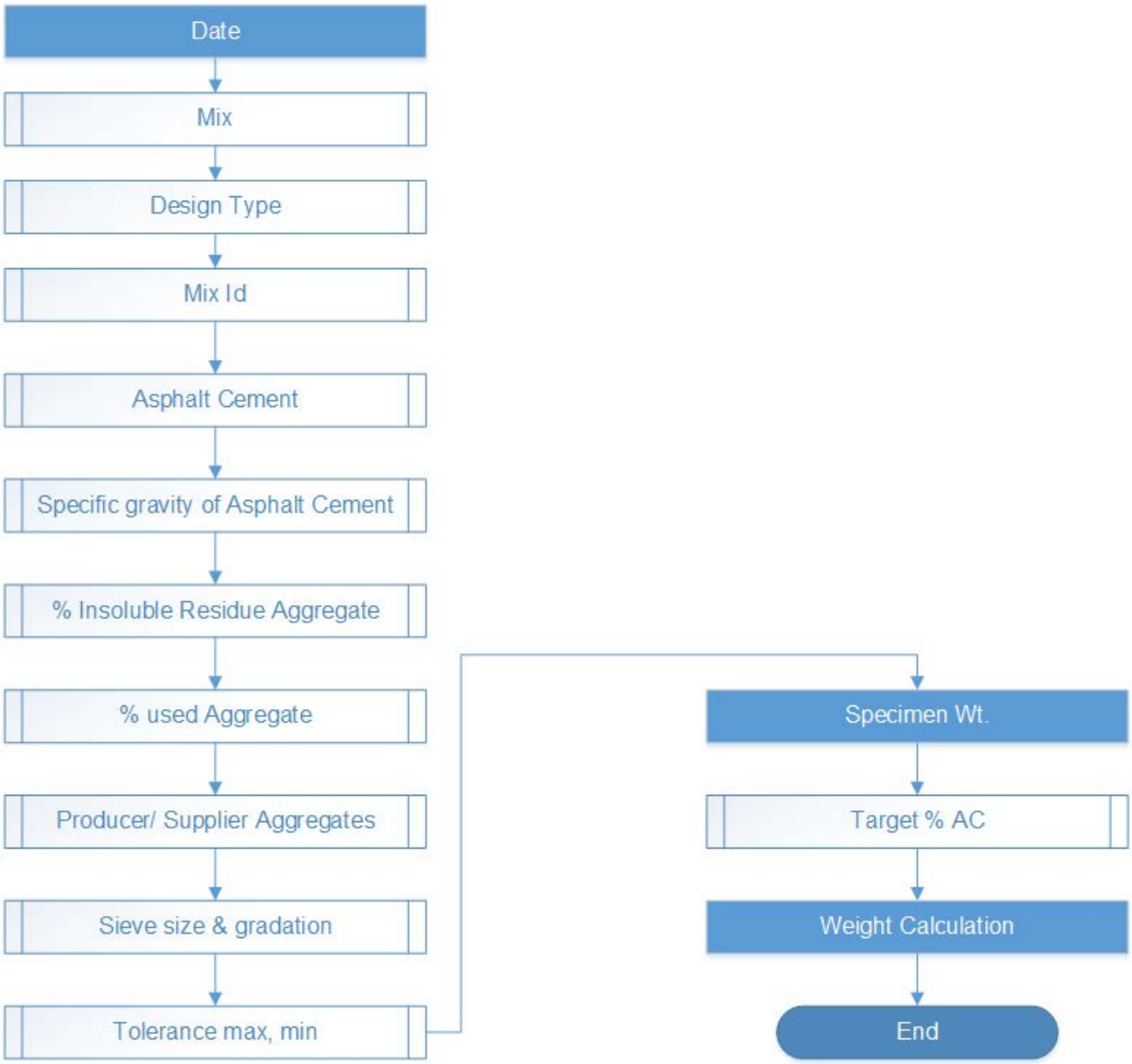
R.S. Batching Option-1:



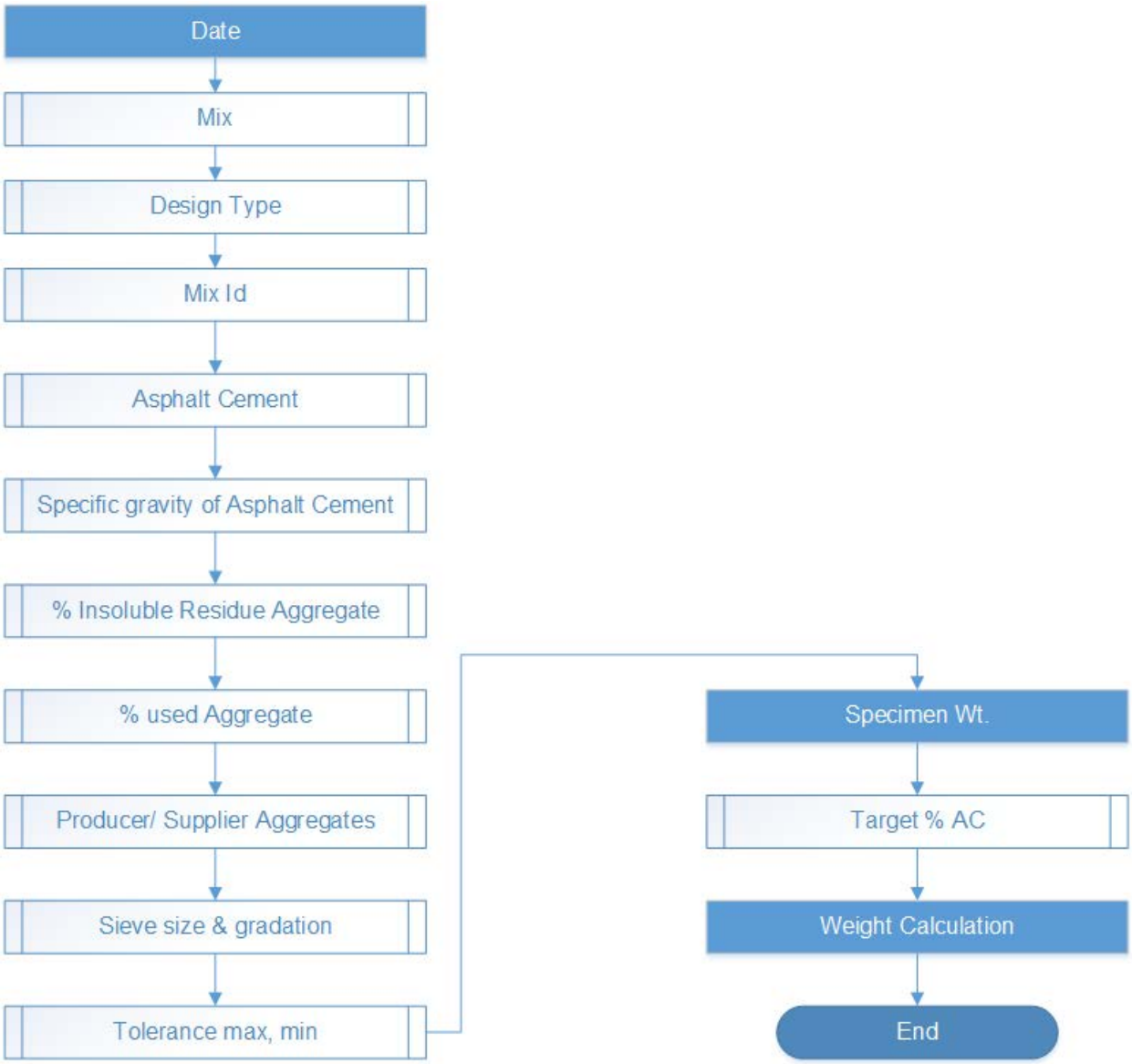
R.S. Batching Option-2:



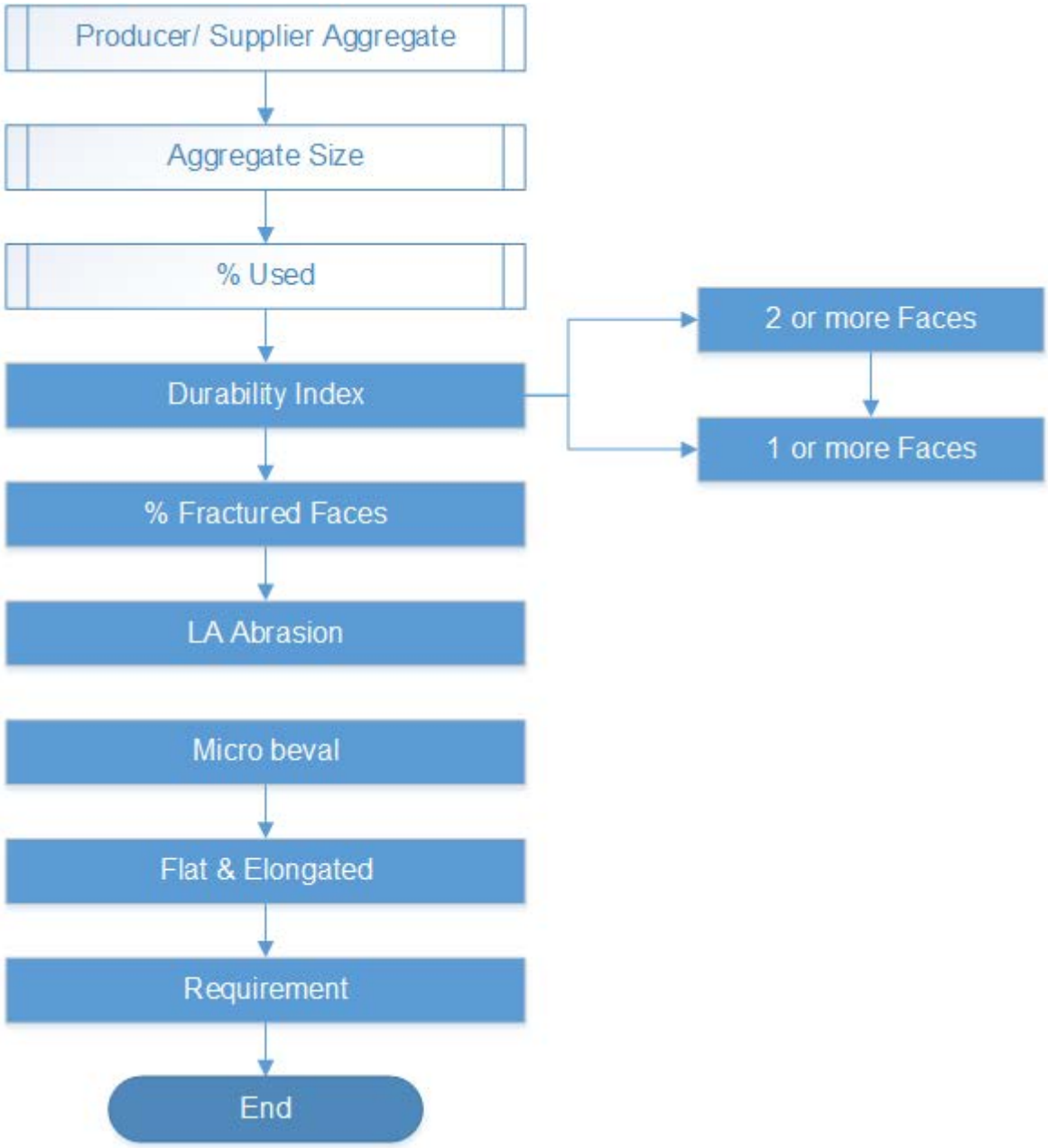
APA Batching Option-1:



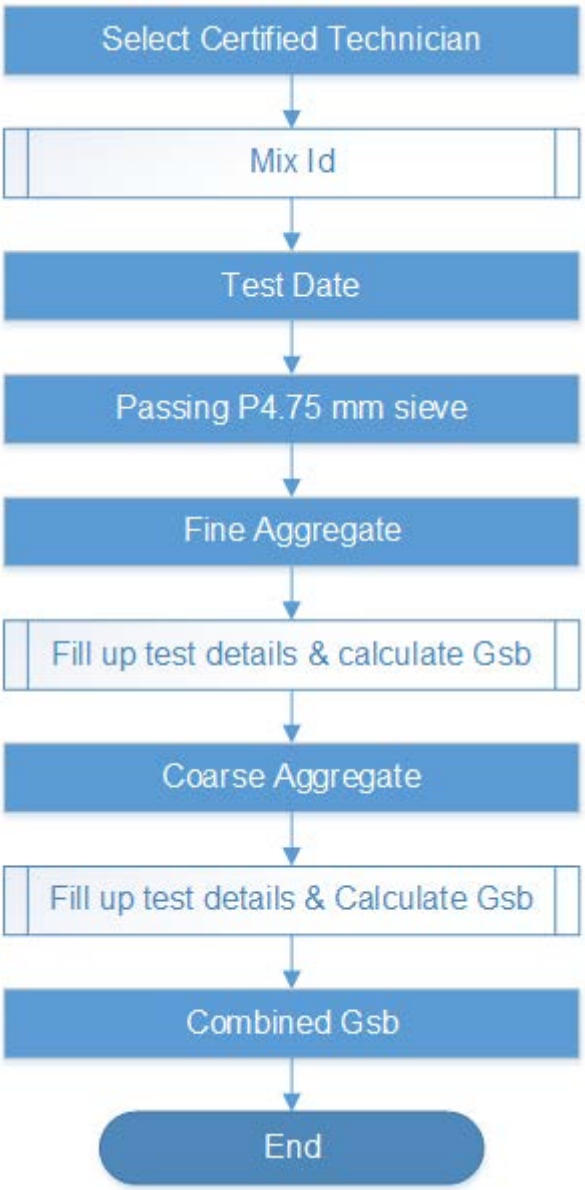
APA Batching Option-2:



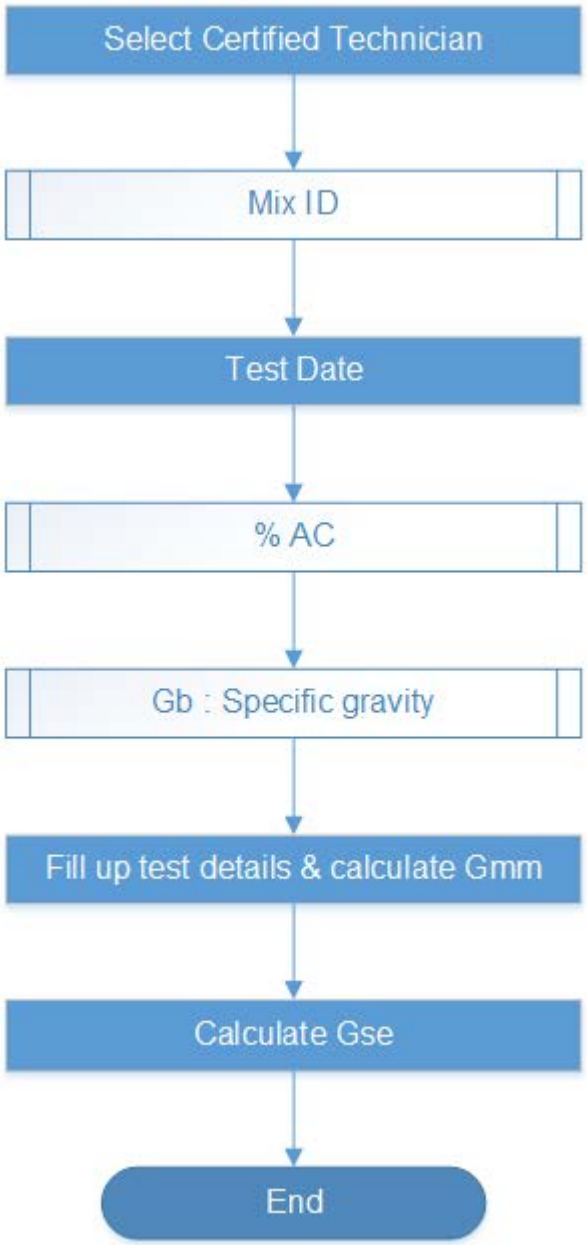
Consensus & Source Properties:



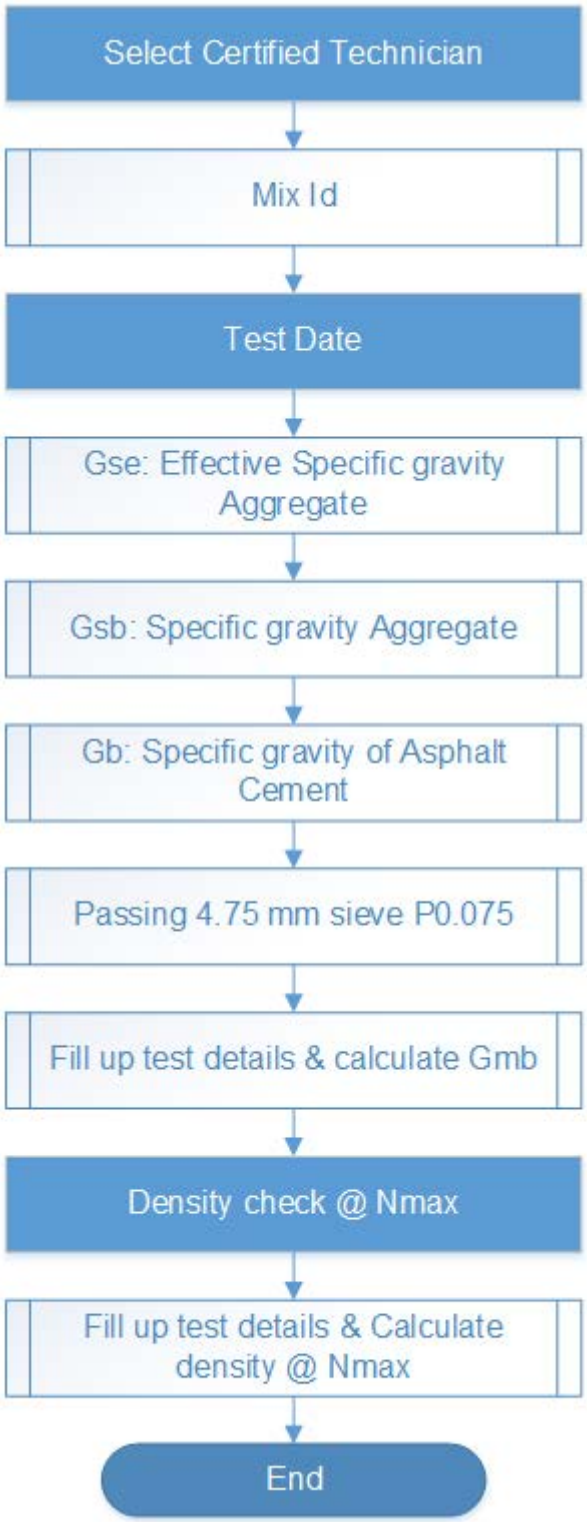
Gsb:


Select Certified Technician
Mix Id
Test Date
Passing P4.75 mm sieve
Fine Aggregate
Fill up test details & calculate Gsb
Coarse Aggregate
Fill up test details & Calculate Gsb
Combined Gsb
End

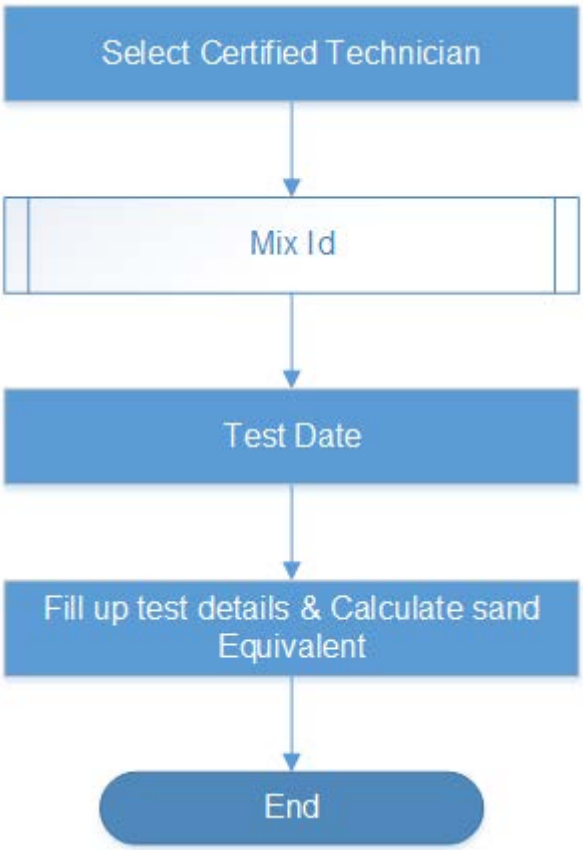
Rice (Gmm):


Select Certified Technician
Mix ID
Test Date
% AC
Gb : Specific gravity
Fill up test details & calculate Gmm
Calculate Gse
End

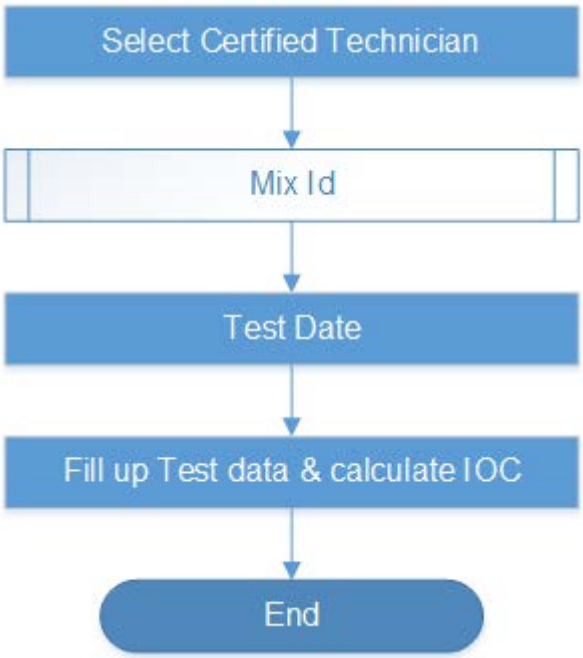
SSD Densities:



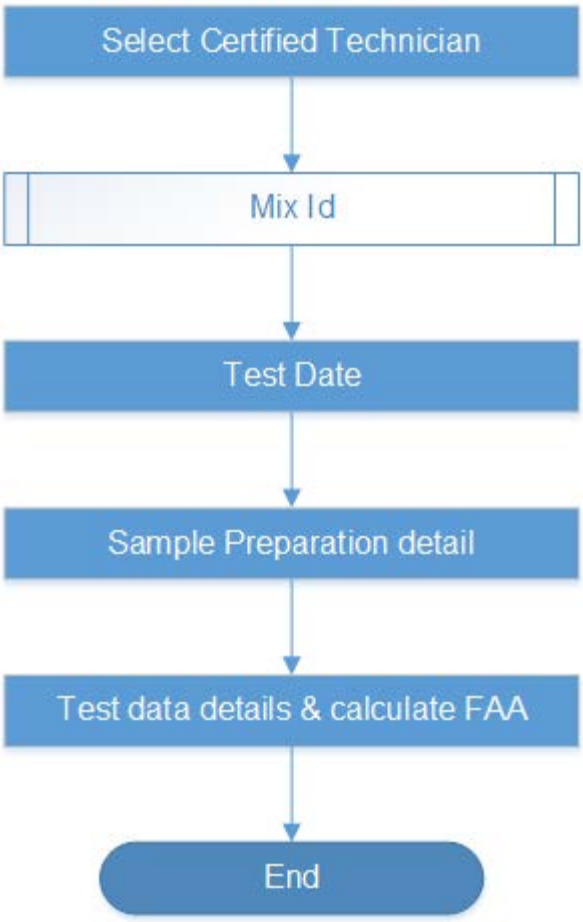
Sand Equivalent:



IOC:

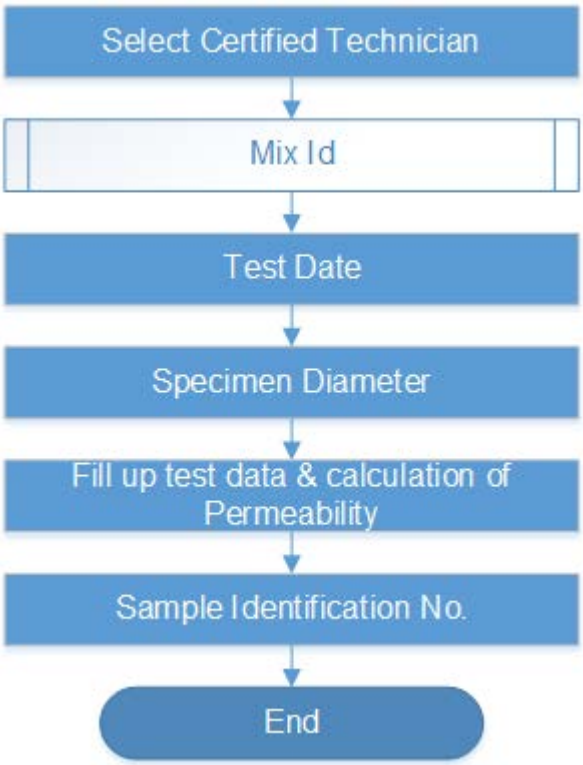

Select Certified Technician
Mix Id
Test Date
Fill up Test data & calculate IOC
End

FAA:

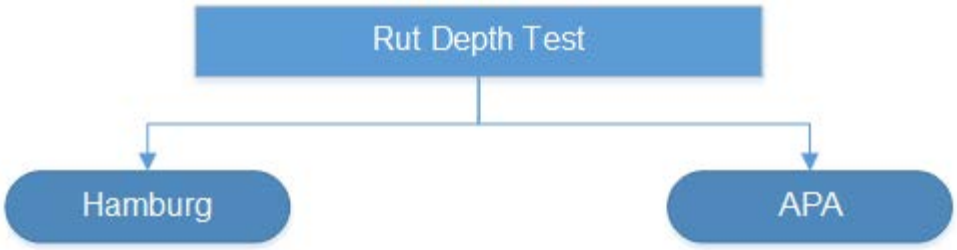

Select Certified Technician
Mix Id
Test Date
Sample Preparation detail
Test data details & calculate FAA
End

Moisture-Induced Damage T-283:

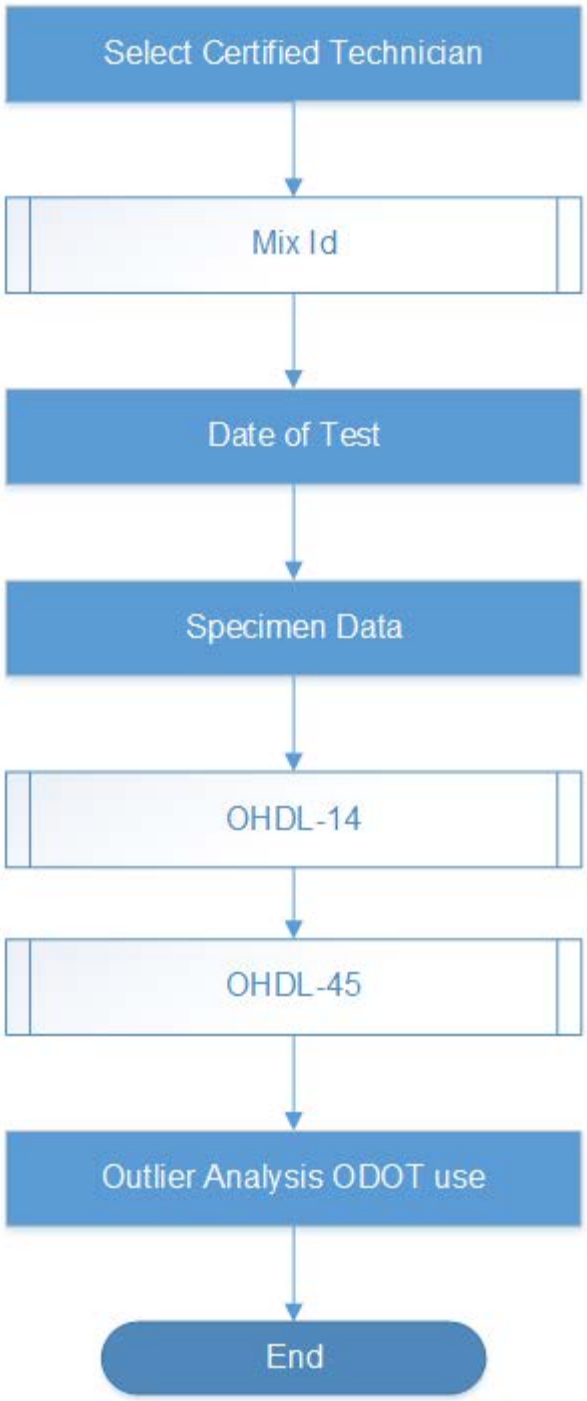
Permeability:



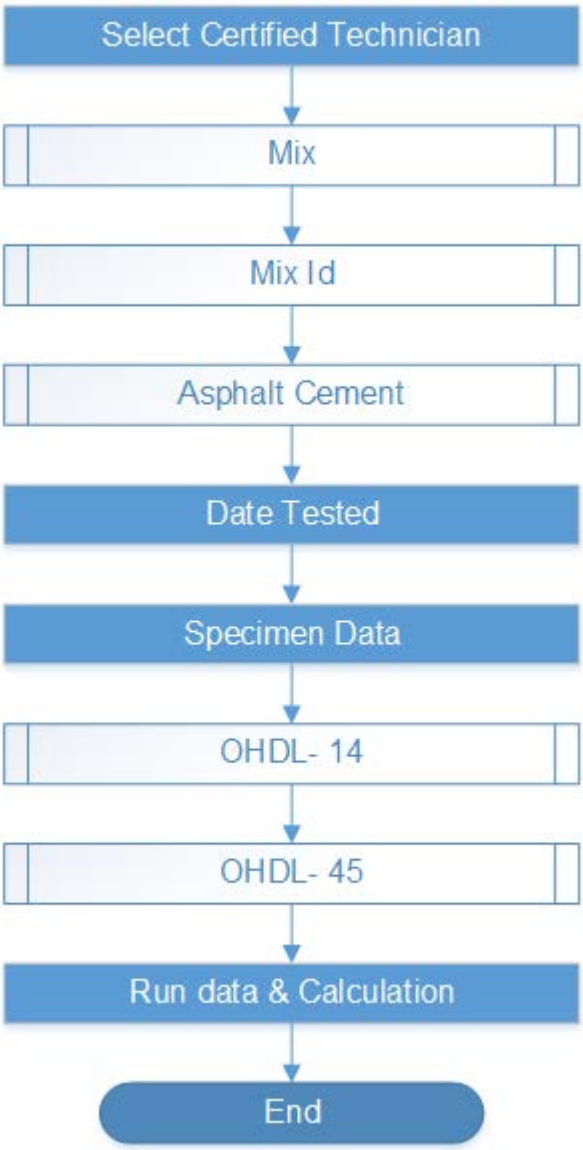
Rut test selection:



APA:

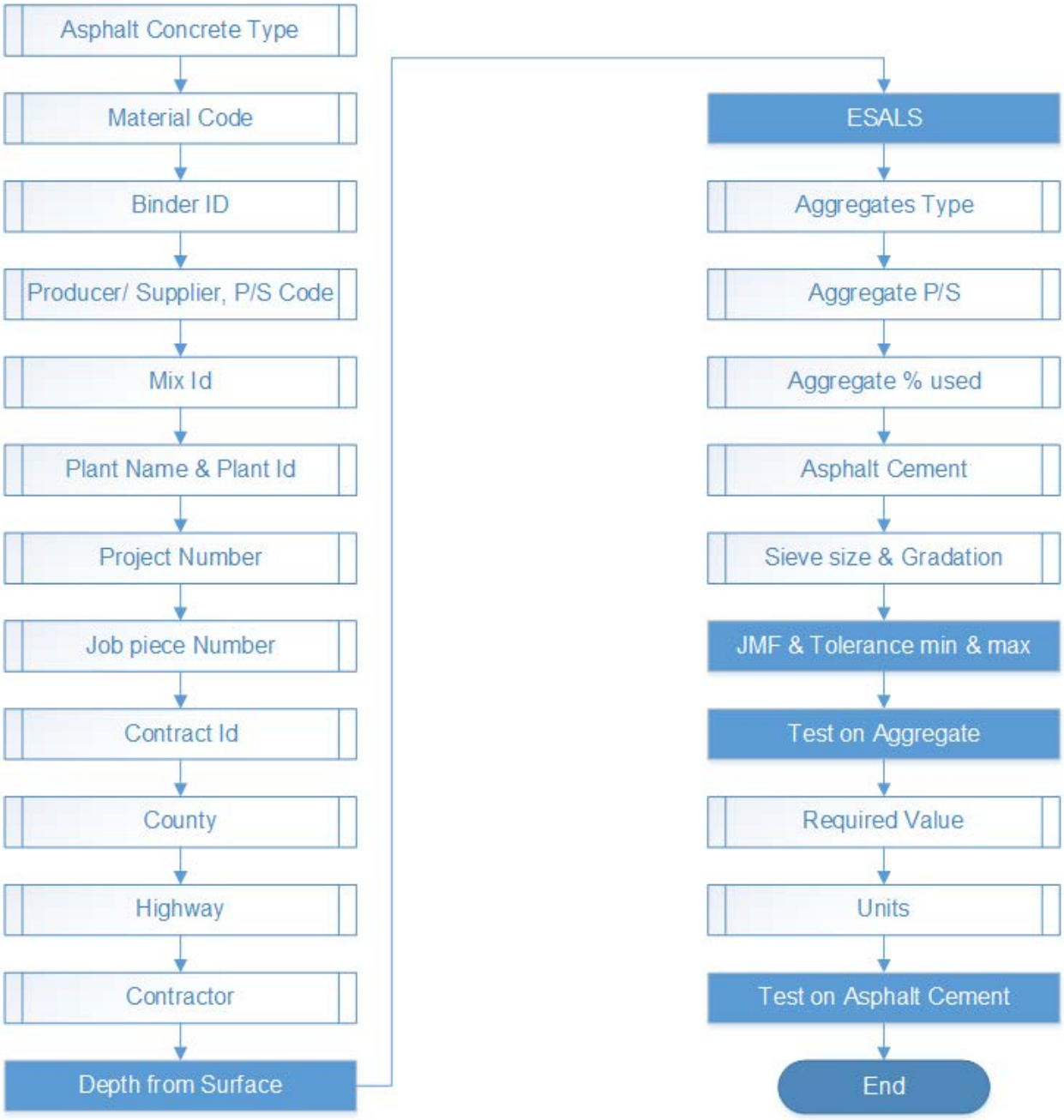

Select Certified Technician
Mix Id
Date of Test
Specimen Data
OHDL-14
OHDL-45
Outlier Analysis ODOT use
End

Hamburg rut test:



Mixing & Computation temperature:

Submittal for Acceptance:



Export Accepted Data:

Appendix B: List of ACMIX Sheets and Function

Module	Total Number of called VBA functions	ID of called VBA functions	Number of in-cell excel equations
1A	22	1; 3; 36; 268; 269; 419; 505; 541; 542; 543; 544; 545; 546; 547; 548; 553; 600; 643; 668; 671; 720; 723;	0
2A	7	3; 42; 359; 504; 562; 731; 920;	7
3A	6	3; 43; 359; 504; 723; 920;	10
4A	5	3; 46; 359; 504; 628;	0
5A	14	3; 359; 504; 629; 700; 702; 704; 706; 708; 710; 712; 714; 918; 920;	137
6A	14	3; 359; 504; 630; 699; 701; 703; 705; 707; 709; 711; 713; 715; 920;	137
7A	5	3; 359; 504; 634; 696;	0
8A	7	3; 142; 359; 504; 535; 635; 920;	231
9A	7	3; 195; 359; 504; 536; 636; 920;	300
10A	7	3; 180; 359; 504; 535; 637; 920;	231
11A	7	3; 230; 359; 504; 536; 638; 920;	300
12A	7	3; 186; 359; 504; 535; 639; 920;	231
13A	7	3; 233; 359; 504; 536; 640; 920;	300
14A	7	3; 136; 359; 504; 535; 610; 920;	231
15A	7	2; 3; 359; 504; 535; 611; 920;	300
16A	6	3; 47; 359; 504; 535; 612;	45
17A	6	3; 125; 359; 504; 535; 615;	13
18A	6	3; 243; 359; 504; 535; 616;	15
19A	7	3; 112; 359; 504; 535; 617; 657;	98
20A	6	3; 248; 359; 504; 535; 618;	4
21A	6	3; 133; 359; 504; 535; 619;	4
22A	6	3; 123; 359; 504; 535; 620;	29
23A	7	3; 255; 359; 504; 535; 621; 920;	63
24A	7	3; 236; 359; 504; 535; 622; 920;	23
25A	6	3; 359; 504; 535; 623; 625;	0
26A	7	3; 37; 359; 504; 535; 624; 920;	84
27A	9	3; 128; 359; 390; 391; 504; 535; 624; 920;	60
28A	5	3; 135; 504; 535; 625;	0
29A	12	3; 250; 359; 504; 527; 535; 554; 626; 642; 692; 695; 920;	269
30A	11	3; 250; 355; 491; 504; 535; 553; 600; 626; 658; 970;	0
This table lists the IDs of the sheets and functions because of space constraints. For more details about the sheets please refer to tables B2 and B3.			

Table B2. ACMIX Design Sheets Description		
1A	Cover Sheet	Instructions
2A	Mix ID Generation (2)	Asphalt Concrete Mix Design ID Generation
3A	Remarks & Information (3)	Asphalt Concrete Mix Design Information and Remarks Submittal Sheet
4A	Select Gradations Option (4)	Stockpile Aggregate Gradations Option to be Used
5A	Gradations-Enter Test Data (5)	Sieve Analysis of Fine and Coarse Aggregates (Current Stockpile Sample Results)
6A	Gradations-Hist. Averages (5a)	Sieve Analysis of Fine and Coarse Aggregates (Historical Average of Stockpile Sample Results)
7A	Select Batching Option (6)	Batching Option to be Used
8A	Init. Batching-Option 1 (7)	Initial Batching Sheet-Option 1 (Combined each stockpile by sieve size)
9A	Init. Batching-Option 2 (7a)	Initial Batching Sheet-Option 2 (Separating each stockpile separately by sieve size)
10A	Nmax Batching-Option 1 (8)	Nmax Batching Sheet Option-1 (Combining each stockpile by sieve size)
11A	Nmax Batching-Option 2 (8a)	Nmax Batching Sheet Option-2(Separating each stockpile separately by sieve size)
12A	R. S. Batching-Option 1 (9)	Retained Strength Batching Sheet Option-1 (Combining each stockpile by sieve size)
13A	R. S. Batching-Option 2 (9a)	Retained Strength Batching Sheet Option-2 (Separating each stockpile separately by sieve size)
14A	APA Batching-Option 1 (10)	APA Batching Sheet Option-1 (Combining each stockpile by sieve size)
15A	APA Batching-Option 2 (10a)	APA Batching Sheet Option-2 (Separating each stockpile separately by sieve size)
16A	Consensus & Source Props. (11)	Estimation of Aggregate Consensus and Source Properties
17A	Gsb (13)	Specific Gravity and Absorption of Fine and Coarse Aggregate
18A	Rice's (14)	Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
19A	SSD Densities (15a)	Lab-Molded Specific Gravities, Densities, and VMA Calculations Tested Using SSD Method
20A	Sand Equivalent (16)	Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test
21A	IOC (17)	Determination of Bitumen Content in Bituminous Paving Mixtures
22A	FAA (18)	Uncompacted Void Content of Fine Aggregate
23A	T-283 (19)	Resistance of Compacted Bituminous Mixture to Moisture-Induced Damage
24A	Permeability (20)	Measurement of Water Permeability on Compacted Paving Mixtures
25A	Select Rut Test (21)	Rut Depth Test to Be Used
26A	APA (21a)	Determining Rutting Susceptibility Using the Asphalt Paving Analyzer
27A	Hamburg (21b)	Hamburg Rut Testing of Compacted Hot Mix Asphalt (HMA)
28A	Mixing & Comp. Temps. (22)	Mixing and Compaction Temperatures
29A	Submittal For Acceptance (23a)	Submittal-For Acceptance Only
30A	Export Accepted Data (24)	For ODOT Materials Division Use Only

Table B3. SM Data Sheets Description.		
1S	SM_DATA	SiteManager Data
2S	INSTRUCTIONS (1)	Asphalt Concrete Mix Design Spreadsheet Operation Instructions
3S	WMA_ADDS	Warm Mix Asphalt (WMA) Technology
4S	Fiber	
5S	Table of Contents	Asphalt Concrete Mix Design Spreadsheet Table of Contents
6S	AGG1	Select Producer/Supplier
7S	AGG2	Select Producer/Supplier
8S	AGG3	Select Producer/Supplier
9S	AGG4	Select Producer/Supplier
10S	AGG5	Select Producer/Supplier
11S	AGG6	Select Producer/Supplier

12S	AGG7	Select Producer/Supplier
13S	AGG8	Select Producer/Supplier
14S	AGG1a	Select Producer/Supplier
15S	AGG2a	Select Producer/Supplier
16S	AGG3a	Select Producer/Supplier
17S	AGG4a	Select Producer/Supplier
18S	AGG5a	Select Producer/Supplier
19S	AGG6a	Select Producer/Supplier
20S	AGG7a	Select Producer/Supplier
21S	AGG8a	Select Producer/Supplier
22S	B) PG Binder Mat'l Types	PG Asphalt Cement Types
23S	PG_AC_PS	PG Asphalt Cement Suppliers
24S	ACEM_PER_MIX_TYP	PG Asphalt Cement Type for Each Asphalt Concrete Mix Type
25S	C) Asph. Conc. List	Asphalt Concrete Types
26S	D) Asph. Conc. Aggr. PS List	Asphalt Concrete Aggregate Producer/Suppliers
27S	E) Mix PS List	Asphalt Concrete Mixture Producer/Suppliers
28S	F) Mix Plant Info	Asphalt Concrete Plant Information
29S	G) Asph. Conc. Aggr.	Asphalt Concrete Aggregate
30S	Aggregate Desc.	Aggregate Descriptions
31S	H) Prod. Tolerances	Mix Design Production Tolerances
32S	I) Grad. Limits	Gradation Limits for All Asphalt Concrete Types
33S	Selected Asph. Conc. Grad. Lim.	
34S	J) All Eff. Dates	Effective Dates for Asphalt Concrete Gradations
35S	K) Effective Dates	Mix Design Gradation Effective Dates
36S	L) Project Information	Asphalt Concrete Project Information
37S	M) Counties	Project Counties
38S	O) Design Types	Mix Design Types
39S	P) Qualf. Des. Tstrs.	Qualified Asphalt Concrete Mix Design Testers List
40S	Q) Qualf. Dsnrs.	Qualified Asphalt Concrete Mix Designers
41S	S) AntiStripAdds	Anti-Strip Additives
42S	T) Qualified Asph. Des. Labs	Qualified Asphalt Design Labs
43S	W) Mix Class Codes	Mixture Class Codes
44S	X) DES_SEQ_NBR	Mix Design Sequence Numbers
45S	Y) YEARS	Years
46S	DAYS_IN_EACH_MONTH	Days In Each Month Determination Sheet
47S	Z) CONTR MIX DES	All Site Manager Contact Asphalt Concrete Mix Designs
48S	Z1) PG_AC_SP_GRAV	Specific Gravity Results of Performance Graded Asphalt Cement
49S	U) SiteManager User List	SiteManager Users
50S	V) Agg. & Des. Properties	Aggregate and Design Properties Requirements

Table B4. ACMIX function names and IDs.

ID	Function Name	ID	Function Name
1	ADDL_INSTRUCTS	488	CPY_PST9
2	APA_BTCH_SHT	489	CPY_PST9a
3	BACK	490	CPY_PSTA
4	CHNG_LNK_SRC	491	CPY_TECH_NMS_FROM_OTH_SPDSHTA
5	CHOS_BATCH_OPT	492	CPY_TECH_NMS_FROM_OTH_SPDSHTB
6	CHOS_GRAD_OPT	493	CTECH_NSEL_13
7	CHOS_RUT_TST	494	CTECH_NSEL_14

8	CLR_OPTBTTNS	495	CTECH_NSEL_15A
9	CLR_SHT_10	496	CTECH_NSEL_15B
10	CLR_SHT_10A	497	CTECH_NSEL_16
11	CLR_SHT_11	498	CTECH_NSEL_17
12	CLR_SHT_13	499	CTECH_NSEL_18
13	CLR_SHT_14	500	CTECH_NSEL_19
14	CLR_SHT_15a	501	CTECH_NSEL_21a
15	CLR_SHT_15b	502	CTECH_NSEL_3
16	CLR_SHT_16	503	CTECH_NSEL_5
17	CLR_SHT_17	504	CVR_SHEET
18	CLR_SHT_18	505	EML_WKB
19	CLR_SHT_19	506	ERROR_NOTF_1
20	CLR_SHT_2	507	ERROR_NOTF_10
21	CLR_SHT_20	508	ERROR_NOTF_11
22	CLR_SHT_21A	509	ERROR_NOTF_12
23	CLR_SHT_21B	510	ERROR_NOTF_13
24	CLR_SHT_23A	511	ERROR_NOTF_14
25	CLR_SHT_23B	512	ERROR_NOTF_15
26	CLR_SHT_24	513	ERROR_NOTF_15A
27	CLR_SHT_3	514	ERROR_NOTF_16
28	CLR_SHT_5	515	ERROR_NOTF_17
29	CLR_SHT_5A	516	ERROR_NOTF_3
30	CLR_SHT_7	517	ERROR_NOTF_3A
31	CLR_SHT_7A	518	ERROR_NOTF_4
32	CLR_SHT_8	519	ERROR_NOTF_4A
33	CLR_SHT_8A	520	ERROR_NOTF_5
34	CLR_SHT_9	521	ERROR_NOTF_5A
35	CLR_SHT_9A	522	ERROR_NOTF_6
36	CLR_SPDSHT	523	ERROR_NOTF_6B
37	COMPL_APAS	524	ERROR_NOTF_7
38	COMPL_APAS_A	525	ERROR_NOTF_8
39	COMPL_APAS_B	526	ERROR_NOTF_9
40	COMPL_APAS_C	527	FRST_STP_REVJMF
41	COMPL_APAS_D	528	FTO
42	COMPL_CELLS_2	529	GEN_NW_MXID
43	COMPL_CELLS_3	530	GEN_NW_MXID1
44	COMPL_CELLS_3A	531	GetBaseName
45	COMPL_CELLS_3B	532	GetFile
46	COMPL_CELLS_4	533	GRAD_SHT_1
47	COMPL_CONSPROPS_A1	534	GRAD_SHT_2
48	COMPL_CONSPROPS_B1	535	GRAPHS
49	COMPL_CONSPROPS_B2	536	HD_UNHD_GRAPHS
50	COMPL_CONSPROPS_B3	537	HDPDFB
51	COMPL_CONSPROPS_B4	538	HDSHT1
52	COMPL_CONSPROPS_B5	539	HDSHT2
53	COMPL_CONSPROPS_B6	540	HDSHT4
54	COMPL_CONSPROPS_B7	541	HLP_CLR_SPDSHT
55	COMPL_CONSPROPS_B8	542	HLP_CPY_FRO_OTH_SPDSHT
56	COMPL_CONSPROPS_C1	543	HLP_EML_SPDSHT
57	COMPL_CONSPROPS_C2	544	HLP_OPN_SMDATA

58	COMPL_CONSPROPS_C3	545	HLP_PRNT_SPEC_SBM_RPT
59	COMPL_CONSPROPS_C4	546	HLP_PST_TO_OTH_SPDSHT
60	COMPL_CONSPROPS_C5	547	HLP_UPD_REFS
61	COMPL_CONSPROPS_C6	548	HLP_UPDCONF_VER
62	COMPL_CONSPROPS_C7	549	IfError
63	COMPL_CONSPROPS_C8	550	ImportFilesUnprotectedCells
64	COMPL_CONSPROPS_D1	551	INIT_BTCH_SHT
65	COMPL_CONSPROPS_D2	552	IsWorkbookOpen
66	COMPL_CONSPROPS_D3	553	LNK_2
67	COMPL_CONSPROPS_D4	554	MAKE_NEW_DES
68	COMPL_CONSPROPS_D5	555	MakePDFb
69	COMPL_CONSPROPS_D6	556	MakePublic
70	COMPL_CONSPROPS_D7	557	MAXM
71	COMPL_CONSPROPS_D8	558	MOD_SEQ_NBR_A
72	COMPL_CONSPROPS_E1	559	MOD_SEQ_NBR_B
73	COMPL_CONSPROPS_E2	560	MOD_SEQ_NBR_C
74	COMPL_CONSPROPS_E3	561	MOD_SEQ_NBR_D
75	COMPL_CONSPROPS_E4	562	MOD_SEQ_NBR_PRL
76	COMPL_CONSPROPS_E5	563	MOD_SEQ_NBR_PRL_1
77	COMPL_CONSPROPS_E6	564	MOD_SEQ_NBR_PRL_2
78	COMPL_CONSPROPS_E7	565	MOD_SEQ_NBR_PRL_3
79	COMPL_CONSPROPS_E8	566	MOD_SEQ_NBR_PRL_4
80	COMPL_CONSPROPS_F1	567	MOVE_TO_TOP_CELL
81	COMPL_CONSPROPS_F2	568	MRG_CLS10
82	COMPL_CONSPROPS_F3	569	MRG_CLS10a
83	COMPL_CONSPROPS_F4	570	MRG_CLS13
84	COMPL_CONSPROPS_F5	571	MRG_CLS14
85	COMPL_CONSPROPS_F6	572	MRG_CLS15a
86	COMPL_CONSPROPS_F7	573	MRG_CLS15b
87	COMPL_CONSPROPS_F8	574	MRG_CLS16
88	COMPL_CONSPROPS_G1	575	MRG_CLS17
89	COMPL_CONSPROPS_G2	576	MRG_CLS18
90	COMPL_CONSPROPS_G3	577	MRG_CLS19
91	COMPL_CONSPROPS_G4	578	MRG_CLS2
92	COMPL_CONSPROPS_G5	579	MRG_CLS20
93	COMPL_CONSPROPS_G6	580	MRG_CLS21a
94	COMPL_CONSPROPS_G7	581	MRG_CLS21b
95	COMPL_CONSPROPS_G8	582	MRG_CLS23a
96	COMPL_CONSPROPS_H1	583	MRG_CLS23b
97	COMPL_CONSPROPS_H2	584	MRG_CLS3
98	COMPL_CONSPROPS_H3	585	MRG_CLS4
99	COMPL_CONSPROPS_H4	586	MRG_CLS5
100	COMPL_CONSPROPS_H5	587	MRG_CLS5a
101	COMPL_CONSPROPS_H6	588	MRG_CLS6
102	COMPL_CONSPROPS_H7	589	MRG_CLS7
103	COMPL_CONSPROPS_H8	590	MRG_CLS7a
104	COMPL_CONSPROPS_I1	591	MRG_CLS8
105	COMPL_CONSPROPS_I2	592	MRG_CLS8a
106	COMPL_CONSPROPS_I3	593	MRG_CLS9
107	COMPL_CONSPROPS_I4	594	MRG_CLS9a

108	COMPL_CONSPROPS_I5	595	MRG_CLSA
109	COMPL_CONSPROPS_I6	596	MySub
110	COMPL_CONSPROPS_I7	597	NMAX_BTCH_SHT
111	COMPL_CONSPROPS_I8	598	OPN_FLNM
112	COMPL_DENS	599	OPN_IMP_FL
113	COMPL_DENS_1	600	OPN_SMDATA
114	COMPL_DENS_A	601	PREV_ON_GRAPHS_A1
115	COMPL_DENS_A_1	602	PREV_ON_GRAPHS_A2
116	COMPL_DENS_B	603	PREV_ON_GRAPHS_B1
117	COMPL_DENS_B_1	604	PREV_ON_GRAPHS_B2
118	COMPL_DENS_C	605	PREV_ON_GRAPHS_C1
119	COMPL_DENS_C_1	606	PREV_ON_GRAPHS_C2
120	COMPL_DENS_D	607	PREV_ON_GRAPHS_D1
121	COMPL_DENS_E	608	PREV_ON_GRAPHS_D2
122	COMPL_DENS_F	609	PREV_ON_GRAPHS_E1
123	COMPL_FAAS	610	PREV_SHEET10_1
124	COMPL_FAAS_A	611	PREV_SHEET10_2
125	COMPL_GSBS	612	PREV_SHEET11
126	COMPL_GSBS_A	613	PREV_SHEET11_1
127	COMPL_GSBS_B	614	PREV_SHEET11_2
128	COMPL_HAMB	615	PREV_SHEET13
129	COMPL_HAMB_A	616	PREV_SHEET14
130	COMPL_HAMB_B	617	PREV_SHEET15
131	COMPL_HAMB_C	618	PREV_SHEET16
132	COMPL_HAMB_D	619	PREV_SHEET17
133	COMPL_IOCS	620	PREV_SHEET18
134	COMPL_IOCS_A	621	PREV_SHEET19
135	COMPL_MIXCOMP_TEMPS	622	PREV_SHEET20
136	COMPL_OPT1_APABS	623	PREV_SHEET21
137	COMPL_OPT1_APABS_A	624	PREV_SHEET21ab
138	COMPL_OPT1_APABS_B	625	PREV_SHEET22
139	COMPL_OPT1_APABS_G	626	PREV_SHEET23a
140	COMPL_OPT1_APABS_G1	627	PREV_SHEET23c
141	COMPL_OPT1_APABS_H	628	PREV_SHEET4
142	COMPL_OPT1_IBS	629	PREV_SHEET5
143	COMPL_OPT1_IBS_A	630	PREV_SHEET5a
144	COMPL_OPT1_IBS_B1	631	PREV_SHEET6
145	COMPL_OPT1_IBS_B2	632	PREV_SHEET6_1
146	COMPL_OPT1_IBS_B3	633	PREV_SHEET6_2
147	COMPL_OPT1_IBS_B4	634	PREV_SHEET6_NC1
148	COMPL_OPT1_IBS_B5	635	PREV_SHEET7
149	COMPL_OPT1_IBS_B6	636	PREV_SHEET7a
150	COMPL_OPT1_IBS_B7	637	PREV_SHEET8_1
151	COMPL_OPT1_IBS_B8	638	PREV_SHEET8_2
152	COMPL_OPT1_IBS_C1	639	PREV_SHEET9_1
153	COMPL_OPT1_IBS_C2	640	PREV_SHEET9_2
154	COMPL_OPT1_IBS_C3	641	PRNT_ACTV_SHT
155	COMPL_OPT1_IBS_C4	642	PRNT_ALL_ACTV_SHTS
156	COMPL_OPT1_IBS_C5	643	PRNT_SHT
157	COMPL_OPT1_IBS_C6	644	PROB1

158	COMPL_OPT1_IBS_C7	645	PROB10
159	COMPL_OPT1_IBS_C8	646	PROB12
160	COMPL_OPT1_IBS_D1	647	PROB2
161	COMPL_OPT1_IBS_D2	648	PROB3
162	COMPL_OPT1_IBS_D3	649	PROB5
163	COMPL_OPT1_IBS_D4	650	PROB6
164	COMPL_OPT1_IBS_D5	651	PROB7
165	COMPL_OPT1_IBS_D6	652	PROB8
166	COMPL_OPT1_IBS_D7	653	PROB9
167	COMPL_OPT1_IBS_D8	654	PROBA
168	COMPL_OPT1_IBS_E1	655	PROBB
169	COMPL_OPT1_IBS_E2	656	PROBC
170	COMPL_OPT1_IBS_E3	657	PROC_CRLK
171	COMPL_OPT1_IBS_E4	658	PROD_PDF_DOCA
172	COMPL_OPT1_IBS_E5	659	PROD_PDF_DOCB
173	COMPL_OPT1_IBS_E6	660	PROT_SHEET
174	COMPL_OPT1_IBS_E7	661	PROT_SHEET_OV
175	COMPL_OPT1_IBS_E8	662	PROTECT_WBK
176	COMPL_OPT1_IBS_F	663	PRT_ALL_SHTS
177	COMPL_OPT1_IBS_G	664	PRT_GRDN_SHTS
178	COMPL_OPT1_IBS_G1	665	PST_TO_CV
179	COMPL_OPT1_IBS_H	666	PST_TO_OTH_SPDSHT
180	COMPL_OPT1_NMBS	667	PST_TO_OTH_SPDSHT_CV
181	COMPL_OPT1_NMBS_A	668	PST_TO_OTH_SPDSHT_PREL
182	COMPL_OPT1_NMBS_F	669	PST_TRANS_SHT_FROM
183	COMPL_OPT1_NMBS_G	670	PST_TRANS_SHT_TO
184	COMPL_OPT1_NMBS_G1	671	REFSH_REFS
185	COMPL_OPT1_NMBS_H	672	REFSH_REFS1
186	COMPL_OPT1_RSBS	673	REFSH_REFS2
187	COMPL_OPT1_RSBS_A	674	REFSH_REFS3
188	COMPL_OPT1_RSBS_F	675	REFSH_REFS4
189	COMPL_OPT1_RSBS_G	676	REFSH_REFS5
190	COMPL_OPT1_RSBS_G1	677	REFSH_REFS6
191	COMPL_OPT1_RSBS_H	678	REFSH_REFS7
192	COMPL_OPT2_APABS	679	REV_GRDN1
193	COMPL_OPT2_APABS_A	680	REV_GRDN10
194	COMPL_OPT2_APABS_B	681	REV_GRDN11
195	COMPL_OPT2_IBS	682	REV_GRDN12
196	COMPL_OPT2_IBS_A	683	REV_GRDN13
197	COMPL_OPT2_IBS_B1	684	REV_GRDN2
198	COMPL_OPT2_IBS_B2	685	REV_GRDN3
199	COMPL_OPT2_IBS_B3	686	REV_GRDN4
200	COMPL_OPT2_IBS_B4	687	REV_GRDN5
201	COMPL_OPT2_IBS_B5	688	REV_GRDN6
202	COMPL_OPT2_IBS_B6	689	REV_GRDN7
203	COMPL_OPT2_IBS_B7	690	REV_GRDN8
204	COMPL_OPT2_IBS_B8	691	REV_GRDN9
205	COMPL_OPT2_IBS_C1	692	REV_JMF
206	COMPL_OPT2_IBS_C2	693	REV_JMF_1
207	COMPL_OPT2_IBS_C3	694	RS_BTCH_SHT

208	COMPL_OPT2_IBS_C4	695	SCND_STP_REVJMF
209	COMPL_OPT2_IBS_C5	696	SEL_BATCH_SHEET
210	COMPL_OPT2_IBS_C6	697	SEL_BTCH_OPT_SHT
211	COMPL_OPT2_IBS_C7	698	SEL_BTCH_OPT_SHT_NC1
212	COMPL_OPT2_IBS_C8	699	SEL_BTCH_OPT_SHT_NC2
213	COMPL_OPT2_IBS_D1	700	SEL_CELLS_1
214	COMPL_OPT2_IBS_D2	701	SEL_CELLS_1_1
215	COMPL_OPT2_IBS_D3	702	SEL_CELLS_2
216	COMPL_OPT2_IBS_D4	703	SEL_CELLS_2_1
217	COMPL_OPT2_IBS_D5	704	SEL_CELLS_3
218	COMPL_OPT2_IBS_D6	705	SEL_CELLS_3_1
219	COMPL_OPT2_IBS_D7	706	SEL_CELLS_4
220	COMPL_OPT2_IBS_D8	707	SEL_CELLS_4_1
221	COMPL_OPT2_IBS_E1	708	SEL_CELLS_5
222	COMPL_OPT2_IBS_E2	709	SEL_CELLS_5_1
223	COMPL_OPT2_IBS_E3	710	SEL_CELLS_6
224	COMPL_OPT2_IBS_E4	711	SEL_CELLS_6_1
225	COMPL_OPT2_IBS_E5	712	SEL_CELLS_7
226	COMPL_OPT2_IBS_E6	713	SEL_CELLS_7_1
227	COMPL_OPT2_IBS_E7	714	SEL_CELLS_8
228	COMPL_OPT2_IBS_E8	715	SEL_CELLS_8_1
229	COMPL_OPT2_IBS_F	716	SEL_GRADS_SHEET
230	COMPL_OPT2_NMBS	717	SEL_GRAPH_SHEET
231	COMPL_OPT2_NMBS_A	718	SEL_GSB_SHT
232	COMPL_OPT2_NMBS_B	719	SEL_PREV_BATCH_SHEET
233	COMPL_OPT2_RSBS	720	SEL_SHEET1
234	COMPL_OPT2_RSBS_A	721	SEL_SHEET10
235	COMPL_OPT2_RSBS_B	722	SEL_SHEET10A
236	COMPL_PERMS	723	SEL_SHEET2
237	COMPL_PERMS_A	724	SEL_SHEET24
238	COMPL_PERMS_B	725	SEL_SHEET7
239	COMPL_PERMS_C	726	SEL_SHEET7A
240	COMPL_PERMS_D	727	SEL_SHEET8
241	COMPL_PERMS_E	728	SEL_SHEET8A
242	COMPL_PERMS_F	729	SEL_SHEET9
243	COMPL_RICES	730	SEL_SHEET9A
244	COMPL_RICES_A	731	SELECT_SHEET23a
245	COMPL_RICES_B	732	SELECT_SHEET23a1
246	COMPL_RICES_C	733	ShowErrMsg
247	COMPL_RUTOPT1	734	SHW_GRAD_SHT
248	COMPL_SES	735	SMD_OPCL
249	COMPL_SES_A	736	SpeedOff
250	COMPL_SUBMFAPPRS	737	SpeedOn
251	COMPL_SUBMFAPPRS_A	738	SpeedUp
252	COMPL_SUBMFAPPRS_B	739	SVAS
253	COMPL_SUBMFAPPRS_C	740	SVS_ACTIVE_1
254	COMPL_SUBMFAPPRS_D	741	SVS_ACTIVE_1A
255	COMPL_T283S	742	SVS_ACTIVE_2
256	COMPL_T283S_A	743	SVS_ACTIVE_2A
257	COMPL_T283S_B	744	SVS_ACTIVE_3

258	COMPL_T283S_C	745	SVS_ACTIVE_3A
259	COMPL_T283S_D1	746	SVS_ACTIVE_4
260	COMPL_T283S_D2	747	SVS_ACTIVE_4A
261	COMPL_T283S_D3	748	SVS_ACTIVE_5
262	COMPL_T283S_D4	749	SVS_ACTIVE_5A
263	COMPL_T283S_D5	750	SVS_ACTIVE_6
264	COMPL_T283S_D6	751	SVS_ACTIVE_6A
265	COMPL_T283S_E	752	SVS_ACTIVE_7
266	COMPL_T283S_F	753	SVS_ACTIVE_7A
267	COMPL_T283S_G	754	SVS_ACTIVE_8
268	CONF_VER	755	SVS_ACTIVE_8A
269	CONF_VER_MSG	756	TDATE_NENT_13
270	CONFMT_CONSPROP	757	TDATE_NENT_14
271	CONFMT_CONSPROP_1A	758	TDATE_NENT_15A
272	CONFMT_CONSPROP_1B	759	TDATE_NENT_15B
273	CONFMT_CONSPROP_1C	760	TDATE_NENT_16
274	CONFMT_CONSPROP_1D	761	TDATE_NENT_17
275	CONFMT_CONSPROP_1E	762	TDATE_NENT_18
276	CONFMT_CONSPROP_1F	763	TDATE_NENT_19
277	CONFMT_CONSPROP_1G	764	TDATE_NENT_20
278	CONFMT_CONSPROP_1H	765	TDATE_NENT_21a
279	CONFMT_CONSPROP_2A	766	TDATE_NENT_21b
280	CONFMT_CONSPROP_2B	767	TDATE_NENT_5
281	CONFMT_CONSPROP_2C	768	TDATE_NENT_5A
282	CONFMT_CONSPROP_2D	769	TDATE_NENT_7
283	CONFMT_CONSPROP_2E	770	TDATE_NENT_7A
284	CONFMT_CONSPROP_2F	771	TDATE_NENT_8
285	CONFMT_CONSPROP_2G	772	TDATE_NENT_8A
286	CONFMT_CONSPROP_2H	773	TDATE_NENT_9
287	CONFMT_CONSPROP_3A	774	TDATE_NENT_9A
288	CONFMT_CONSPROP_3B	775	TEST_PASS_1_1
289	CONFMT_CONSPROP_3C	776	TEST_PASS_1_2
290	CONFMT_CONSPROP_3D	777	TEST_PASS_1_3
291	CONFMT_CONSPROP_3E	778	TEST_PASS_1_4
292	CONFMT_CONSPROP_3F	779	TEST_PASS_1_5
293	CONFMT_CONSPROP_3G	780	TEST_PASS_1_6
294	CONFMT_CONSPROP_3H	781	TEST_PASS_1_7
295	CONFMT_CONSPROP_4A	782	TEST_PASS_1_8
296	CONFMT_CONSPROP_4B	783	TEST_PASS_1A_1
297	CONFMT_CONSPROP_4C	784	TEST_PASS_1A_2
298	CONFMT_CONSPROP_4D	785	TEST_PASS_1A_3
299	CONFMT_CONSPROP_4E	786	TEST_PASS_1A_4
300	CONFMT_CONSPROP_4F	787	TEST_PASS_1A_5
301	CONFMT_CONSPROP_4G	788	TEST_PASS_1A_6
302	CONFMT_CONSPROP_4H	789	TEST_PASS_1A_7
303	CONFMT_CONSPROP_5A	790	TEST_PASS_1A_8
304	CONFMT_CONSPROP_5B	791	TEST_PASS_2_1
305	CONFMT_CONSPROP_5C	792	TEST_PASS_2_2
306	CONFMT_CONSPROP_5D	793	TEST_PASS_2_3
307	CONFMT_CONSPROP_5E	794	TEST_PASS_2_4

308	CONFMT_CONSPROP_5F	795	TEST_PASS_2_5
309	CONFMT_CONSPROP_5G	796	TEST_PASS_2_6
310	CONFMT_CONSPROP_5H	797	TEST_PASS_2_7
311	CONFMT_CONSPROP_6A	798	TEST_PASS_2_8
312	CONFMT_CONSPROP_6B	799	TEST_PASS_2A_1
313	CONFMT_CONSPROP_6C	800	TEST_PASS_2A_2
314	CONFMT_CONSPROP_6D	801	TEST_PASS_2A_3
315	CONFMT_CONSPROP_6E	802	TEST_PASS_2A_4
316	CONFMT_CONSPROP_6F	803	TEST_PASS_2A_5
317	CONFMT_CONSPROP_6G	804	TEST_PASS_2A_6
318	CONFMT_CONSPROP_6H	805	TEST_PASS_2A_7
319	CONFMT_CONSPROP_7A	806	TEST_PASS_2A_8
320	CONFMT_CONSPROP_7AF	807	TEST_PASS_3_1
321	CONFMT_CONSPROP_7AP	808	TEST_PASS_3_2
322	CONFMT_CONSPROP_7B	809	TEST_PASS_3_3
323	CONFMT_CONSPROP_7BF	810	TEST_PASS_3_4
324	CONFMT_CONSPROP_7BP	811	TEST_PASS_3_5
325	CONFMT_CONSPROP_7C	812	TEST_PASS_3_6
326	CONFMT_CONSPROP_7CF	813	TEST_PASS_3_7
327	CONFMT_CONSPROP_7CP	814	TEST_PASS_3_8
328	CONFMT_CONSPROP_7D	815	TEST_PASS_3A_1
329	CONFMT_CONSPROP_7DF	816	TEST_PASS_3A_2
330	CONFMT_CONSPROP_7DP	817	TEST_PASS_3A_3
331	CONFMT_CONSPROP_7E	818	TEST_PASS_3A_4
332	CONFMT_CONSPROP_7EF	819	TEST_PASS_3A_5
333	CONFMT_CONSPROP_7EP	820	TEST_PASS_3A_6
334	CONFMT_CONSPROP_7F	821	TEST_PASS_3A_7
335	CONFMT_CONSPROP_7FF	822	TEST_PASS_3A_8
336	CONFMT_CONSPROP_7FP	823	TEST_PASS_4_1
337	CONFMT_CONSPROP_7G	824	TEST_PASS_4_2
338	CONFMT_CONSPROP_7GF	825	TEST_PASS_4_3
339	CONFMT_CONSPROP_7GP	826	TEST_PASS_4_4
340	CONFMT_CONSPROP_7H	827	TEST_PASS_4_5
341	CONFMT_CONSPROP_7HF	828	TEST_PASS_4_6
342	CONFMT_CONSPROP_7HP	829	TEST_PASS_4_7
343	CONFMT_CONSPROP_A	830	TEST_PASS_4_8
344	CONFMT_CONSPROP_B	831	TEST_PASS_4A_1
345	CONFMT_CONSPROP_C	832	TEST_PASS_4A_2
346	CONFMT_CONSPROP_D	833	TEST_PASS_4A_3
347	CONFMT_CONSPROP_E	834	TEST_PASS_4A_4
348	CONFMT_CONSPROP_F	835	TEST_PASS_4A_5
349	CONFMT_CONSPROP_G	836	TEST_PASS_4A_6
350	CONFMT_CONSPROP_H	837	TEST_PASS_4A_7
351	COPY_FR_OTH_SPDSHT_CV	838	TEST_PASS_4A_8
352	COPY_FR_OTH_SPDSHT_OV	839	TEST_PASS_5_1
353	CORRECT_NOTF	840	TEST_PASS_5_2
354	CPY_ALL_CV	841	TEST_PASS_5_3
355	CPY_ALL_DATA_RGDLSS	842	TEST_PASS_5_4
356	CPY_ALL_OV	843	TEST_PASS_5_5
357	CPY_BETW_CV	844	TEST_PASS_5_6

358	CPY_BETW_OV	845	TEST_PASS_5_7
359	CPY_FR_OTH_SPDSHT_PREL	846	TEST_PASS_5_8
360	CPY_FR_OTH_SPDSHT10	847	TEST_PASS_5A_1
361	CPY_FR_OTH_SPDSHT10_OV	848	TEST_PASS_5A_2
362	CPY_FR_OTH_SPDSHT10a	849	TEST_PASS_5A_3
363	CPY_FR_OTH_SPDSHT10a_OV	850	TEST_PASS_5A_4
364	CPY_FR_OTH_SPDSHT11	851	TEST_PASS_5A_5
365	CPY_FR_OTH_SPDSHT11_OV	852	TEST_PASS_5A_6
366	CPY_FR_OTH_SPDSHT13	853	TEST_PASS_5A_7
367	CPY_FR_OTH_SPDSHT13_OV	854	TEST_PASS_5A_8
368	CPY_FR_OTH_SPDSHT14	855	TEST_PASS_6_1
369	CPY_FR_OTH_SPDSHT14_OV	856	TEST_PASS_6_2
370	CPY_FR_OTH_SPDSHT15a	857	TEST_PASS_6_3
371	CPY_FR_OTH_SPDSHT15a_OV	858	TEST_PASS_6_4
372	CPY_FR_OTH_SPDSHT15b	859	TEST_PASS_6_5
373	CPY_FR_OTH_SPDSHT15b_OV	860	TEST_PASS_6_6
374	CPY_FR_OTH_SPDSHT16	861	TEST_PASS_6_7
375	CPY_FR_OTH_SPDSHT16_OV	862	TEST_PASS_6_8
376	CPY_FR_OTH_SPDSHT17	863	TEST_PASS_6A_1
377	CPY_FR_OTH_SPDSHT17_OV	864	TEST_PASS_6A_2
378	CPY_FR_OTH_SPDSHT18	865	TEST_PASS_6A_3
379	CPY_FR_OTH_SPDSHT18_OV	866	TEST_PASS_6A_4
380	CPY_FR_OTH_SPDSHT19	867	TEST_PASS_6A_5
381	CPY_FR_OTH_SPDSHT19_OV	868	TEST_PASS_6A_6
382	CPY_FR_OTH_SPDSHT2	869	TEST_PASS_6A_7
383	CPY_FR_OTH_SPDSHT2_OV	870	TEST_PASS_6A_8
384	CPY_FR_OTH_SPDSHT20	871	TEST_PASS_7_1
385	CPY_FR_OTH_SPDSHT20_OV	872	TEST_PASS_7_2
386	CPY_FR_OTH_SPDSHT21	873	TEST_PASS_7_3
387	CPY_FR_OTH_SPDSHT21_OV	874	TEST_PASS_7_4
388	CPY_FR_OTH_SPDSHT21a	875	TEST_PASS_7_5
389	CPY_FR_OTH_SPDSHT21a_OV	876	TEST_PASS_7_6
390	CPY_FR_OTH_SPDSHT21ab_OHDL14	877	TEST_PASS_7_7
391	CPY_FR_OTH_SPDSHT21ab_OHDL45	878	TEST_PASS_7_8
392	CPY_FR_OTH_SPDSHT21b	879	TEST_PASS_7A_1
393	CPY_FR_OTH_SPDSHT21b_OV	880	TEST_PASS_7A_2
394	CPY_FR_OTH_SPDSHT23a	881	TEST_PASS_7A_3
395	CPY_FR_OTH_SPDSHT23a_OV	882	TEST_PASS_7A_4
396	CPY_FR_OTH_SPDSHT3	883	TEST_PASS_7A_5
397	CPY_FR_OTH_SPDSHT3_OV	884	TEST_PASS_7A_6
398	CPY_FR_OTH_SPDSHT4	885	TEST_PASS_7A_7
399	CPY_FR_OTH_SPDSHT4_OV	886	TEST_PASS_7A_8
400	CPY_FR_OTH_SPDSHT5	887	TEST_PASS_8_1
401	CPY_FR_OTH_SPDSHT5_OV	888	TEST_PASS_8_2
402	CPY_FR_OTH_SPDSHT5a	889	TEST_PASS_8_3
403	CPY_FR_OTH_SPDSHT5a_OV	890	TEST_PASS_8_4
404	CPY_FR_OTH_SPDSHT6	891	TEST_PASS_8_5
405	CPY_FR_OTH_SPDSHT6_OV	892	TEST_PASS_8_6
406	CPY_FR_OTH_SPDSHT7	893	TEST_PASS_8_7
407	CPY_FR_OTH_SPDSHT7_OV	894	TEST_PASS_8_8

408	CPY_FR_OTH_SPDSHT7a	895	TEST_PASS_8A_1
409	CPY_FR_OTH_SPDSHT7a_OV	896	TEST_PASS_8A_2
410	CPY_FR_OTH_SPDSHT8	897	TEST_PASS_8A_3
411	CPY_FR_OTH_SPDSHT8_OV	898	TEST_PASS_8A_4
412	CPY_FR_OTH_SPDSHT8a	899	TEST_PASS_8A_5
413	CPY_FR_OTH_SPDSHT8a_OV	900	TEST_PASS_8A_6
414	CPY_FR_OTH_SPDSHT9	901	TEST_PASS_8A_7
415	CPY_FR_OTH_SPDSHT9_OV	902	TEST_PASS_8A_8
416	CPY_FR_OTH_SPDSHT9a	903	TEST_SMPL_INFO_1
417	CPY_FR_OTH_SPDSHT9a_OV	904	TEST_SMPL_INFO_1A
418	CPY_FROM_OTH_SPDSHT	905	TEST_SMPL_INFO_2
419	CPY_FROM_OTH_SPDSHT_PREL	906	TEST_SMPL_INFO_2A
420	CPY_GRAD_DTLS	907	TEST_SMPL_INFO_3
421	CPY_JMF_REVS_DETLS	908	TEST_SMPL_INFO_3A
422	CPY_JMF_REVS_DETLS_1	909	TEST_SMPL_INFO_4
423	CPY_PREV_JMF_VALS	910	TEST_SMPL_INFO_4A
424	CPY_PST_TO_MDES_SPDSHT10	911	TEST_SMPL_INFO_5
425	CPY_PST_TO_MDES_SPDSHT10a	912	TEST_SMPL_INFO_5A
426	CPY_PST_TO_MDES_SPDSHT11	913	TEST_SMPL_INFO_6
427	CPY_PST_TO_MDES_SPDSHT13	914	TEST_SMPL_INFO_6A
428	CPY_PST_TO_MDES_SPDSHT14	915	TEST_SMPL_INFO_7
429	CPY_PST_TO_MDES_SPDSHT15a	916	TEST_SMPL_INFO_7A
430	CPY_PST_TO_MDES_SPDSHT15b	917	TEST_SMPL_INFO_8
431	CPY_PST_TO_MDES_SPDSHT16	918	TEST_SMPL_INFO_8A
432	CPY_PST_TO_MDES_SPDSHT17	919	Testing
433	CPY_PST_TO_MDES_SPDSHT18	920	TOP_ANY_SHEET
434	CPY_PST_TO_MDES_SPDSHT19	921	TRANS_SHT
435	CPY_PST_TO_MDES_SPDSHT2	922	UHDPDFb
436	CPY_PST_TO_MDES_SPDSHT20	923	UHDSHT1
437	CPY_PST_TO_MDES_SPDSHT21	924	UHDSHT2
438	CPY_PST_TO_MDES_SPDSHT21a	925	UHDSHT4
439	CPY_PST_TO_MDES_SPDSHT21ab_OHDL14	926	UNDO_ALL_REV
440	CPY_PST_TO_MDES_SPDSHT21ab_OHDL45	927	UNDO_LAST_REV
441	CPY_PST_TO_MDES_SPDSHT21b	928	UNL_CD
442	CPY_PST_TO_MDES_SPDSHT23a	929	UNMRG_CLS10
443	CPY_PST_TO_MDES_SPDSHT23b_CV	930	UNMRG_CLS10a
444	CPY_PST_TO_MDES_SPDSHT23b_OV	931	UNMRG_CLS13
445	CPY_PST_TO_MDES_SPDSHT3	932	UNMRG_CLS14
446	CPY_PST_TO_MDES_SPDSHT4	933	UNMRG_CLS15a
447	CPY_PST_TO_MDES_SPDSHT5	934	UNMRG_CLS15b
448	CPY_PST_TO_MDES_SPDSHT5a	935	UNMRG_CLS16
449	CPY_PST_TO_MDES_SPDSHT6	936	UNMRG_CLS17
450	CPY_PST_TO_MDES_SPDSHT7	937	UNMRG_CLS18
451	CPY_PST_TO_MDES_SPDSHT7a	938	UNMRG_CLS19
452	CPY_PST_TO_MDES_SPDSHT8	939	UNMRG_CLS2
453	CPY_PST_TO_MDES_SPDSHT8a	940	UNMRG_CLS20
454	CPY_PST_TO_MDES_SPDSHT9	941	UNMRG_CLS21a
455	CPY_PST_TO_MDES_SPDSHT9a	942	UNMRG_CLS21b
456	CPY_PST_TO_MDES_SPDSHTA	943	UNMRG_CLS23a
457	CPY_PST10	944	UNMRG_CLS23b

458	CPY_PST10a	945	UNMRG_CLS3
459	CPY_PST11	946	UNMRG_CLS4
460	CPY_PST13	947	UNMRG_CLS5
461	CPY_PST14	948	UNMRG_CLS5a
462	CPY_PST15a	949	UNMRG_CLS6
463	CPY_PST15b	950	UNMRG_CLS7
464	CPY_PST16	951	UNMRG_CLS7a
465	CPY_PST17	952	UNMRG_CLS8
466	CPY_PST18	953	UNMRG_CLS8a
467	CPY_PST19	954	UNMRG_CLS9
468	CPY_PST2	955	UNMRG_CLS9a
469	CPY_PST20	956	UNMRG_CLSA
470	CPY_PST21	957	UNP_ALL_SHTS
471	CPY_PST21_OV	958	UNP_JMF_REV_DTLS
472	CPY_PST21a	959	UNPR_GRDN_SHTS
473	CPY_PST21ab_OHDL14	960	UNPR_GRDN_SHTSA_CV
474	CPY_PST21ab_OHDL45	961	UNPR_GRDN_SHTSA_OV
475	CPY_PST21b	962	UNPROT_SHEET
476	CPY_PST23a	963	UNPROT_SHEET_OV
477	CPY_PST23b	964	UNPROTECT_WBK
478	CPY_PST23b_OV	965	UNPROTECT_WBK_OV
479	CPY_PST3	966	UPDATE_TBL
480	CPY_PST4	967	UPDATE_TBL1
481	CPY_PST5	968	UPDATE_TBL2
482	CPY_PST5a	969	UPDATE_TBL4
483	CPY_PST6	970	UPDATE_TBLSA
484	CPY_PST7	971	UPDATE_TBLSB
485	CPY_PST7a	972	USED_RSLTS_1
486	CPY_PST8	973	USED_RSLTS_2
487	CPY_PST8a		

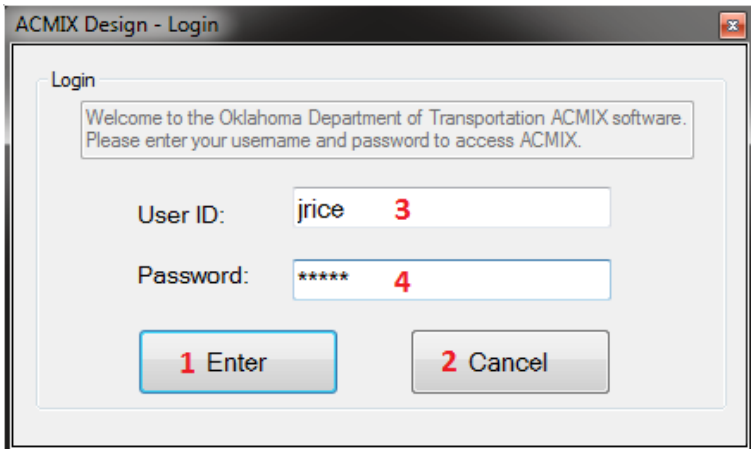
Table B5. SM_Data querries.			
Query Used in SM_DATA	**Query Descriptions**	**Table(s) Involved**	**Unique Table List**
WMA_ADDS	Warm mix Asphalt (qual028)	SMDB_T_APPRD_MATL	SMDB_T_APPRD_MATL
		SMDB_T_PRODR_	SMDB_T_PRODR_
		SMDB_T_PRODR_SUPP_MATL	SMDB_T_PRODR_SUPP_MATL
		SMDB_T_MATL	SMDB_T_PRODR_SUPP
FIBR	fiber material + P/S	SMDB_T_PRODR_SUPP_MATL	SMDB_T_MATL
		SMDB_T_MATL	SMDB_T_MATL_GRDN_DTL
		SMDB_T_PRODR_SUPP	SMDB_T_BIT_CONC_MIXBLND
PG_AC_TYPES	Active Asphaltic Cement Types (acem001, acem002, acem003)	SMDB_T_MATL	SMDB_T_PRODR_SUPP_PLANT
PG_AC_PS	all distinct Asphaltic Cement material with producer/supplier info	SMDB_T_PRODR_SUPP_MATL	SMDB_T_CD_TBL_DTL
		SMDB_T_MATL	SMDB_T_BIT_CONC_MIXBLND
		SMDB_T_PRODR_SUPP	AGGR_TYPS
PG_AC_PS_EA_2	return All Asphalt Concrete (PFCSMA, UTBWC, and OG)	SMDB_T_MATL_GRDN_DTL	SIEVES_TOLS
		SMDB_T_PRODR_	TOL_VALS
		SMDB_T_PRODR_SUPP_MATL	SIEVES_INFO
		SMDB_T_MATL	SMDB_T_ADDR
MATERIALS	all Asphalt Concrete materials (codes starts with 'asco') excludes the one with fullname 'Asphalt Concrete, Micro Surf*' and not asco004 and asco005	SMDB_T_MATL_GRDN_DTL	SMDB_T_CONT
		SMDB_T_MATL	SMDB_T_VEND
PSLIST_AGGR_2	all distinct P/S for superpave materials (qual018 and qual019)	SMDB_T_MATL	SMDB_T_CD_TBL_DTL
		SMDB_T_PRODR_	SMDB_T_TST_PRSN_QUALFN
		SMDB_T_PRODR_SUPP_MATL	SMDB_T_MATL_USER
PSLIST_MIX	al distinct P/S for mix	SMDB_T_BIT_CONC_MIXBLND	SMDB_T_QUALF_LAB
		SMDB_T_PRODR_SUPP	SMDB_T_LAB_QUALFN
PS_PLNTS_INFO	all contract/project plant info with look up descriptions for plant info	SMDB_T_PRODR_SUPP_PLANT	SMDB_T_ADDR
		SMDB_T_CD_TBL_DTL	MIX_CLASS_CDS
AGGRS	all material codes with full name starts with "Asphalt Concrete Aggregate".	SMDB_T_BIT_CONC_MIXBLND	SEQ_NBR
		SMDB_T_MATL	YR_LT_DGT
AGGR_TYPS	all aggregate brand name. This is a table info instead of query	AGGR_TYPS	YR_RT_DGT
SIEVES_TOLS	table. sieve sizes for all asphalt concrete with TOLERANCE fk with TOL_VAl	SIEVES_TOLS	SMDB_T_SUPERPAVE
		TOL_VALS	
GRADATION_1	gradation testing info for all Asphalt Concrete materials, with all MATERIAL attributes and all SIEVE attributes. CD_DESC here is the Sieve sizes description	SMDB_T_MATL_GRDN_DTL	SMDB_T_USER_G
		SMDB_T_MATL	DES_PROPS_OF_AGGS
		SIEVES_INFO	
		SMDB_T_CD_TBL_DTL	

Table B5. SM_Data querries.			
Query Used in SM_DATA	**Query Descriptions**	**Table(s) Involved**	**Unique Table List**
GRADATION_EFF_DT	all effective dates of Asphalt Concrete materials , a matl_cd can have more than 1 effective dates	SMDB_T_MATL_GRDN_DTL	
		SMDB_T_MATL	
EFF_DATES_SPECIFIC	distinct gradation_effective dates for Asphalt Concrete materials (no matl_cd)	SMDB_T_MATL_GRDN_DTL	
		SMDB_T_MATL	
COMB_PRIM_CONTRCTR_INFO	all active contracts for Asphalt or Asphalt/Concrete combined highways with full address listed. CD_DESC in this query is the county info.	SMDB_T_ADDR	
		SMDB_T_CD_TBL_DTL	
		SMDB_T_CONT	
		SMDB_T_VEND	
COUNTIES	all counties in OK, county name and county codes. There are 77 counties, with 2 more values are MULTIPLE CO. and STATEWIDE	SMDB_T_CD_TBL_DTL	
MIX_TYPS	definitions for Mix Design Types (MIXDSN)	SMDB_T_CD_TBL_DTL	
QUALIF_AMDS1A	distinct active qualified Asphalt Mix Design Lev. 1 (AMD1) and Asphalt Mix Design Lev. 2 (AMD2) technician user_id and name	SMDB_T_TST_PRSN_QUALFN	
		SMDB_T_MATL_USER	
		SMDB_T_CD_TBL_DTL	
QUALIF_AMDS2A	all active qualified Asphalt Mix Design Lev. 2 (AMD2) technician user_id and name	SMDB_T_CD_TBL_DTL	
		SMDB_T_MATL_USER	
		SMDB_T_CD_TBL_DTL	
ANTI_STRIP_ADDS	all approved anti strip address materials(code: addi003) that are not yet expired at query time with producer/supplier info, effective date, and expiration date.	SMDB_T_APPRD_MATL	
		SMDB_T_PRODR_SUPP	
		SMDB_T_PRODR_SUPP_MATL	
		SMDB_T_MATL	
QUALF_LABS_SPMD	active qualified superpave labs (lab_id begins with py and qc, and lab qualification = SPMD)with expanded address (type COMP)	SMDB_T_QUALF_LAB	
		SMDB_T_LAB_QUALFN	
		SMDB_T_ADDR	
SM_MIX_CLASS_CDS	returns mix-id, mix-desc, matl_cd for all Asphalt Concrete materials (codes starts with 'asco') excludes the one with fullname 'Asphalt Concrete, Micro Surf*'	MIX_CLASS_CDS	
		SMDB_T_MATL_GRDN_DTL	
		SMDB_T_MATL	
SEQ_NBR	table. Number 001 - 999	SEQ_NBR	
YR_LT_DGT	table. Number 0 - 9	YR_LT_DGT	
YR_RT_DGT	table. Number 0 - 9	YR_RT_DGT	
CONTR_MIX_DESIGNS_2	all superpave table data with mix-id splitted into combination of other data such as qualified lab id, sequence number…etc	SMDB_T_SUPERPAVE	
PG_AC_SPG_RSLTS_2	missing query, use to on SM_DATA.xls sheet Z1) PG_AC_SP_GRAV - specify gravity result of performance graded Asphalt Cement (within past year)		
SM_USERS	SM users which belongs to materials group (MATSTA) and central lab	SMDB_T_USER_G	
		SMDB_T_MATL_USER	

Table B5. SM_Data querries.			
Query Used in SM_DATA	**Query Descriptions**	**Table(s) Involved**	**Unique Table List**
		SMDB_T_TST_PRSN_QUALFN	
DES_PROPS_OF_AGGS	table. Aggregation properties of all asphalt concrete	DES_PROPS_OF_AGGS	

Appendix C: Windows Forms and Function Calls of New Mix Design Program

Login Form



Description

The Login form gives access to the ACMIX software

Input : UserId, Password

Output : Main window form

Methods:

1) btnEnter_Click- Checks whether the user is legal or illegal by comparing the userid and password to database

2) btnCancel_Click- Closes the Application

3) txtUserID_Enter- This Event Selects all the text entered in the UserId field using txtUserid_SelectAll ()

4) txtPassword_Enter- This Event Selects all the text entered in Password field using txtPassword_SelectAll ()

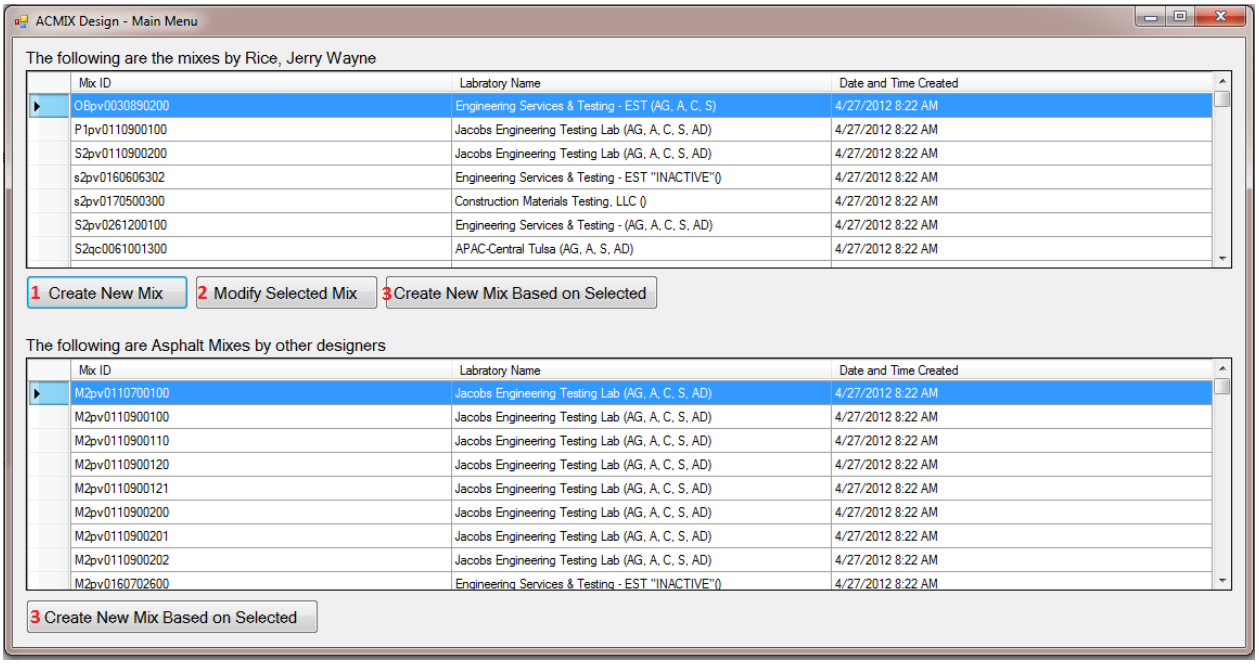
5) txtPassword_KeyDown- This Event Detect a Enter or Escape key down inside the Password textbox

Errors:

When UserId=NULL and Password=NULL then message "Please make sure you enter a valid username and password" pops out

When UserId or Password is not Legal then message "User name or password is not correct" pops out

Main Form



Description

After Successful Login, user have an access to Windows Main Form that displays the users and other designers mix design and provides an option to Create new mix designs or modify the existing ones.

Methods

1) btnCreate_Click

When "Create New Mix" button is clicked by the user it initiates a new instant of the Windows form to create a new mix design

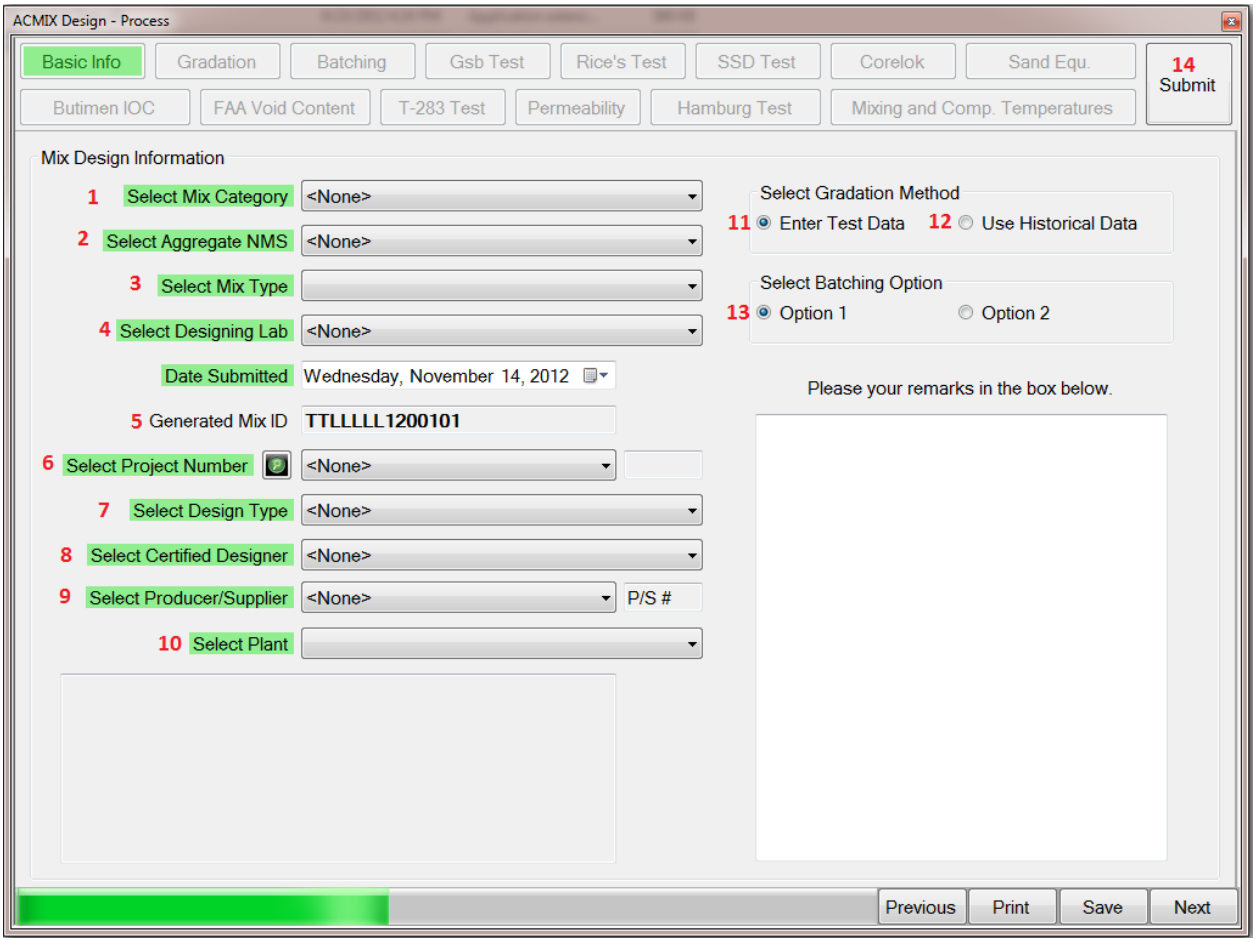
frmACMIX_Process.ShowDialog()- allows user to modify the design

2) btnCreate_Modify

When "Modify Selected Mix" button is clicked it initiates a form with data from the selected mix design to be modified

md_idMixDesign - Opens a table with details of the design
frmACMIX_Process.ShowDialog()- Allows user to modify the design

Basic Info Tab



Description

This widow is initiated when user tries to create a new Mix Design or Modify existing one allowing the user to enter general Mix design information

Methods

1) populateCmbSelectMixCategory()
Retrieve data from the database and populate the SelectMixCategory ComboBox
Events:
cmbSelectMixCategory_SelectedIndexChanged- Archives a change in the selected item of cmbSelectMixCategory

2) populateCmbSelectAggregateNMS()
Retrieve data from the database and populate the SelectAggregateNMS ComboBox
Events:
cmbSelectAggregateNMS_SelectedIndexChanged()- Archive a change in the selected item of cmbSelectAggregateNMS

3) populateCmbSelectMixtype()
Retrieve data from the database and populate the SelectMixType ComboBox
Events:
cmbSelectMixType_SelectedIndexChanged() -Archive a change in the selected item of cmbSelectMixType

4) populateCmbSelectLab()
Retrieve data from the database and populate the SelectMixLab ComboBox
Events:
cmbSelectLab_SelectedIndexChanged()-Archive a change in the selected item of cmbSelectLab

5) GenerateMixID()
Generate a mix design ID based on "TTLLLLLYYSSSCR" format
Input Variables : TT, LLLLL, YY, SSS, C, R
Output Variables: MixId

6) populateCmbSelectProject()
Retrieve data from the database and populate the SelectProject ComboBox
Events:
cmbSelectProject_SelectedIndexChanged()-Archive a change in the selected item of cmbSelectProject

7) populateCmbSelectDesignType()
Retrieve data from the database and populate the SelectDesignType ComboBox
Events:
cmbSelectDesignType_SelectedIndexChanged()-Archive a change in the selected item of cmbSelectDesignType

8) populateCmbSelectDesigner()
Retrieve data from the database and populate the SelectDesigner ComboBox
Events:
cmbSelectDesigner_SelectedIndexChanged()-Archive a change in the selected item of cmbSelectDesigner

9) populateCmbSelectProducer()
Retrieve data from the database and populate the SelectProducer ComboBox
Events:
cmbSelectProducer_SelectedIndexChanged()-Archive a change in the selected item of cmbSelectProducer
Methods:
populateCmbSelectPlant()-Retrieve data from the database and populate the SelectPlant ComboBox
Events:
cmbSelectPlant_SelectedIndexChanged()-Archive a change in the selected item of cmbSelectPlant

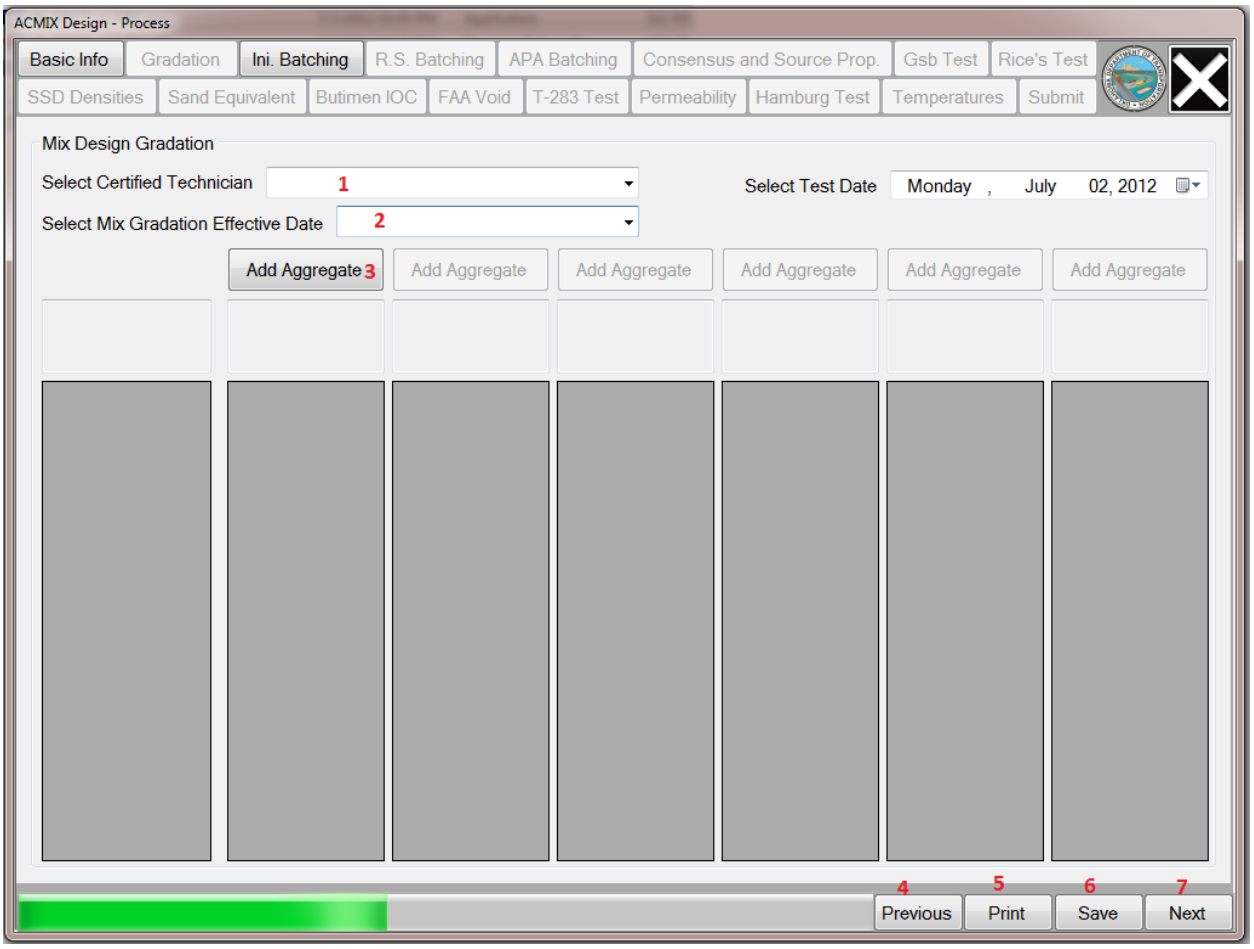
10) rbGradationTestData_CheckedChanged- Detect a radio button change in rbGradationTestData and Set the appropriate gradation method

11) rbHistoricalData_CheckedChanged- Detect a radio button change in rbHistoricalData and Set the appropriate gradation method

12) rbBatchingOption2_CheckedChanged- Detect a radio button change in rbBatchingOption2 and Set the appropriate batching option

13) btnPrevious_Click- Moves to previous tab
14) btnPrint_Click- Calls the printing form to print the Mix Design
15) btnSave_Click- Save changes to the database over the internet
16) btnNext_Click- Move to Next Tab

Gradation Tab



This form Populates the data using the below methods:

1) populateCmbCertifiedTechnician()-Populates the certified technician data in the drop down box.

2) populateCmbGradationEffectiveDate()-Populates the Gradation effective date in the drop down box.

3) If ADDAGGREGATE button is clicked, then this event will be handled by the "btnAddAggregate1_Click" function.

Submethod

AddAggGradation() method- This will open a new window called as AGGINPUT(frmagginput.vb)

SubMethods

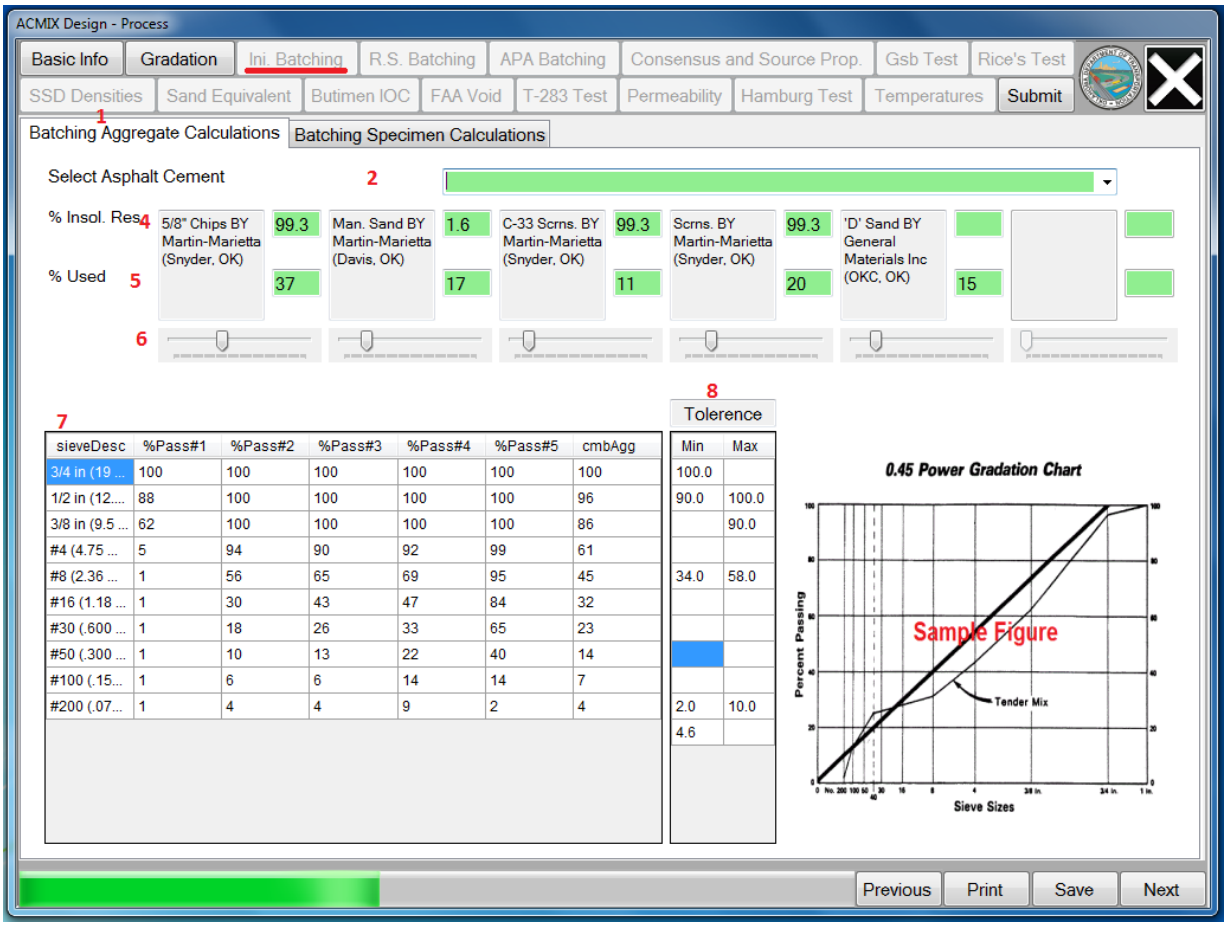
populate_cmbAggType()- populates the Aggregate Type in the comboBox.

populate_cmbAggProducer()- populates the Producer data/ producer Id data in the ComoBox.

btnInsert_Click()- Inserts all the data to the Gradation List Box.

4) btnPrevious_Click- Moves to previous tab
5) btnPrint_Click- Calls the printing form to print the Mix Design
6) btnSave_Click- Save changes to the database over the internet
7) btnNext_Click- Move to Next Tab

BatchingTab



This form enables the user to Calculate Batchin Aggregate Calculations and Batching Specimen Calculations.

Methods

1) populateBatchingOption()-populate Batching option selection dependent controls. Also allows the user to Modify the appropriate controls based on the selected batching option

subMethods:(For Batching option 1)

populate_dgvGilsonWt_Opt1()-Populate dgvGilsonWt DataGridView with the appropriate data from the database for batching option 1 calculations.

dgvGilsonWt_CellPainting- Override the cell painting method of the dgvJMF control for vertical text format in the headers

populate_dgvBatchingWtCalc_Opt1()-Populate dgvBatchingWtCalc DataGridView with the appropriate data from the database for batching option 1 calculations.

SubMethods: (For Batching Option 2)

populate_dgvGilsonWt_Opt2()-Populate dgvGilsonWt DataGridView with the appropriate data from the database for batching option 2 calculations.

dgvGilsonWt_CellPainting- Override the cell painting method of the dgvJMF control for vertical text format in the headers

populate_dgvBatchingWtCalc_Opt2()-Populate dgvBatchingWtCalc DataGridView with the appropriate data from the database for batching option 2 calculations.

2)populateCmbSelectAsphaltCement()-Retrieve data from the database and populate the cmbSelectAsphaltCement ComboBox

cmbSelectAsphaltCement_SelectedIndexChanged- Detect a change in the selected value of the asphalt cement.

3)txtRAP_TextChanged- Detect RAP value changed and perform the appropriate calculations

4)txtInsolRes_TextChanged_1- Detect insoluble residue value changed and perform the appropriate calculations.

5)txtPercentUsed1_TextChanged- Percent used is changed for aggregate 1.
txtPercentUsed2_TextChanged- Percent used is changed for aggregate 2
txtPercentUsed3_TextChanged- Percent used is changed for aggregate 3
txtPercentUsed4_TextChanged- Percent used is changed for aggregate 4
txtPercentUsed5_TextChanged- Percent used is changed for aggregate 5
txtPercentUsed6_TextChanged- Percent used is changed for aggregate 6

SubMethod

AggPtUsedChanged()-Update the batching calculations once the percentage used value of an aggregate is changed.

SubMethod

CalcCombAggPt()-Perform batching combination percentage calculations.
UpdateSandEquivalentTBL()-Perform sand equivalent calculations for the batching tab.
ImportCombAgg()-Import batching combination percentage for batching calculations.
CalBatchingWT()-Perform batching calculations.

SubMethod

calculatePtLossAndWaterWt- Calculate the loss percent and water weight.

CalBatchingWTLastCol()-Calculate the batching weights column.

6) tbUsed1_Scroll- Percent used is changed for aggregate 1.
tbUsed2_Scroll- Percent used is changed for aggregate 2.
tbUsed3_Scroll- Percent used is changed for aggregate 3.
tbUsed4_Scroll- Percent used is changed for aggregate 4.
tbUsed5_Scroll- Percent used is changed for aggregate 5.

tbUsed6_Scroll- Percent used is changed for aggregate 6.

7) populate_dgvBatchingGradation()-Populate dgvBatchingGradation DataGridView with the appropriate data from the database.

8) populate_dgvTolerence()-Populate tblTolerance DataGridView with the appropriate data from the database.

9) populate_dgvSandEquivalent()-Populate dgvSandEquivalent DataGridView with the appropriate data from the database.

10) populate_dgvACperWt()-Populate dgvACperWt DataGridView with the appropriate data from the database.

dgvACperWt_CellFormatting- Override the cell formatting method of the dgvACperWt control for appropriate decimal number rounding.

cmbFiber_SelectedIndexChanged- Detect a change in the selected value of percent fiber.

11) dgvBatchingWtCalc_CellValueChanged- Perform the appropriate calculation upon a cell value change in dgvBatchingWtCalc.

dgvBatchingWtCalc_DataError- Detects an error and acts accordingly

SubMethod

CalBatchingWT()- Performs Batching Calculations.

SubMethod

calculatePtLossAndWaterWt()-Calculate the loss percent and water weight

dgvWtCalculations_VisibleChanged- Detect if dgvWtCalculations is visible.

SubMethod

BatchingWeightCellsPainting()- Update calculations only when the dgvWtCalculations is visible.

SubMethod

ImportCombAgg()-Import batching combination percentage for batching calculations.

12) populate_dgvConSrcProp()-Populate dgvConSrcProp DataGridView with the appropriate data from the database.

populate_dgvConSrcPropRequirements()-Populate dgvConSrcPropRequirements DataGridView with the appropriate data from the database.

dgvConSrcProp1_CellPainting- Override the cell painting method of the dgvConSrcProp1 control for vertical text format in the headers.

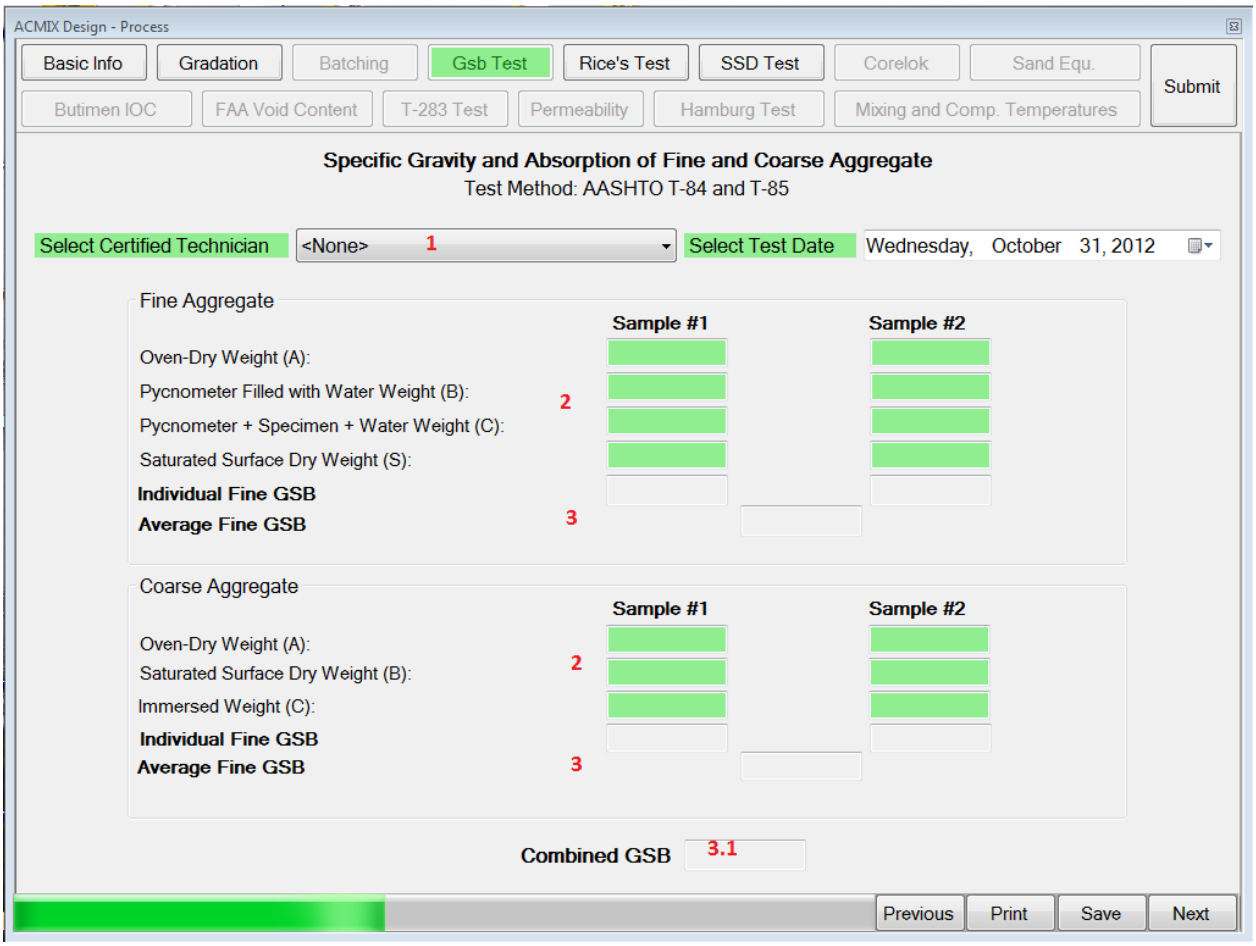
dgvConSrcProp2_DataError- Detect data type errors in dgvConSrcProp2 DataGridView and act accordingly.

dgvConSrcProp2_CellValueChanged- Perform the appropriate calculation upon a cell value change in dgvConSrcProp2.

13) dgvBatchingGradation_CellPainting- Override the cell painting method of the dgvJMF control for vertical text format in the headers.

dgvBatchingGradation_CellFormatting- Override the cell formatting method of the dgvBatchingGradation control for appropriate decimal number rounding and color coding.

Gsb Test Tab



Description

This Gsb Test button enables the user to calculate the Specific Gravity and Absorption of Fine and Coarse Aggregate.

Methods

1) populateCmbCertifiedTechnician()- Populates the Certified TEchnician data into the combobox.

2) txtBox_TextChanged_1, - This Event detects a change in the Textbox of Sample #1, Sample #2 and calls the method calculateGSB()

3) CalculateGSB()-Execute the fields Individual Fine GSB and Average Fine GSB with the appropriate calculations by calling the Methods calculateFineGSB(),calculateCoarseGSB()

SubMethod

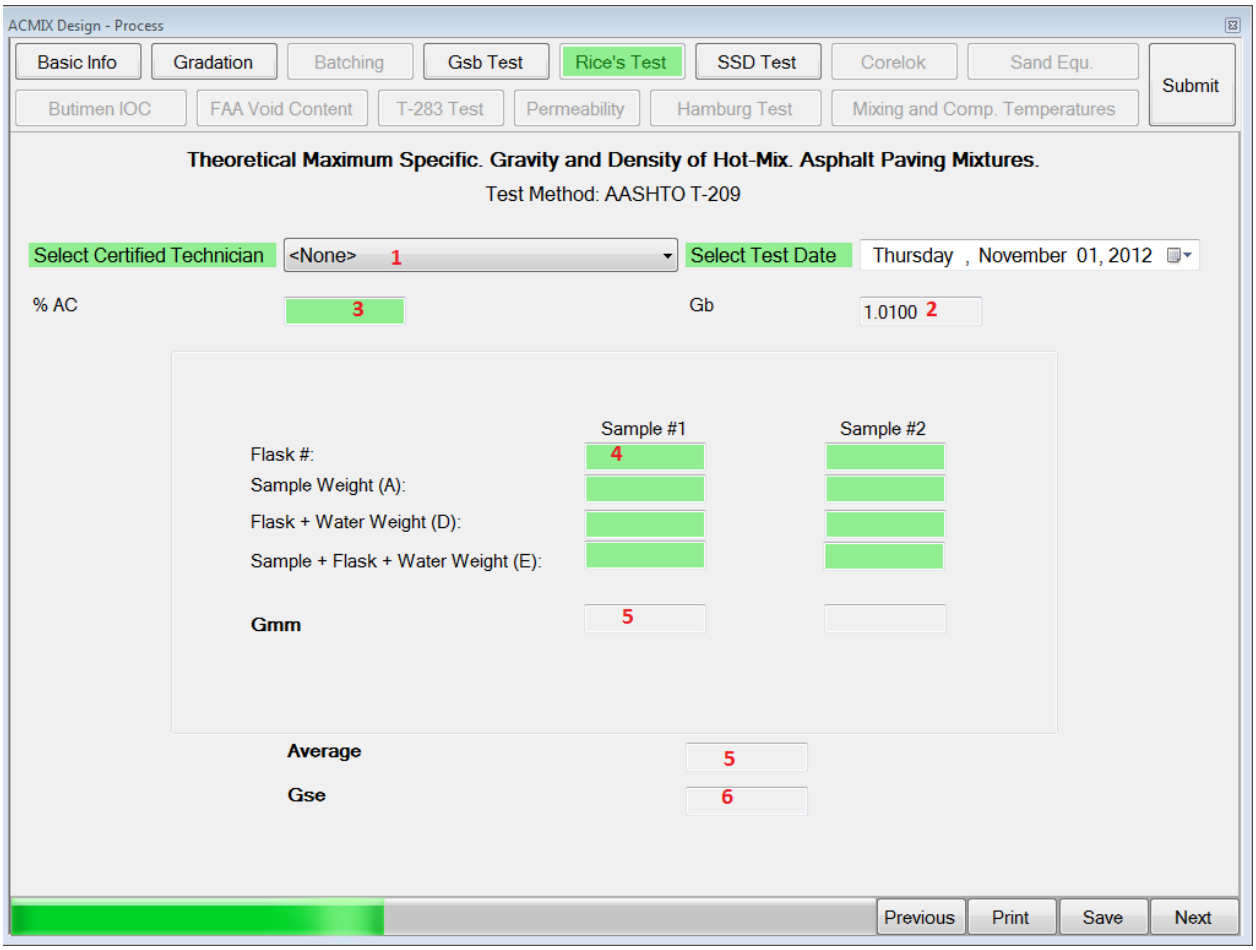
calculateFineGSB()- Calculates the FineGsb and AverageGsb by applying Mathematical Formulae

calculateCoarseGSB()- Calculates the CoarseGsb and AverageGsb by applying Mathematical Formulae

3) txtFine_AverageGSB_TextChanged- This Event Detects a change in the Textbox AverageGsb and calls the method CalculateGsb()

3.1) CalculateGsb()- Calcucates the Combined Gsb

Rice's Test Tab



Description

Rice's Test tab enables the user to calculate Gse values.

Methods

1) populateCmbCertifiedTechnician()- Populates the Certified Techniician Data in the ComboBox.

2) populateFiber()- Populates the fields with appropriate data and controls based on the MixtypeCode

3) txtPtAC_TextChanged- This Event Detects a Change in the %AC textbox and if the Value is less the 100 then it Updates the JMF Value.

4) nudflaskNumber2_ValueChanged_1- This Event Detects a Change in the field Flask (Numeric Updown) and calls the method Calculate_Gse()

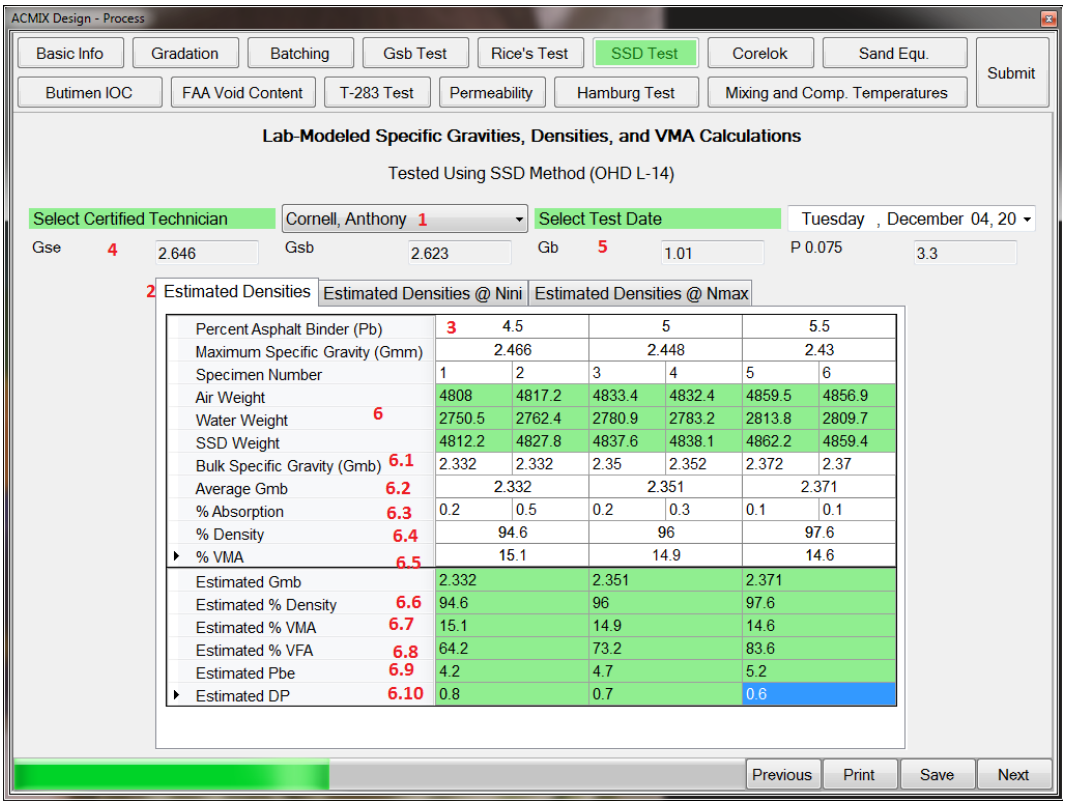
5) CalculateGmm()- Checks if the fields flask, Sample Weight, Flask+ WaterWeight, Sample+ Flask+ WaterWeight are not empty and calculates Gmm, and Average Gmm.

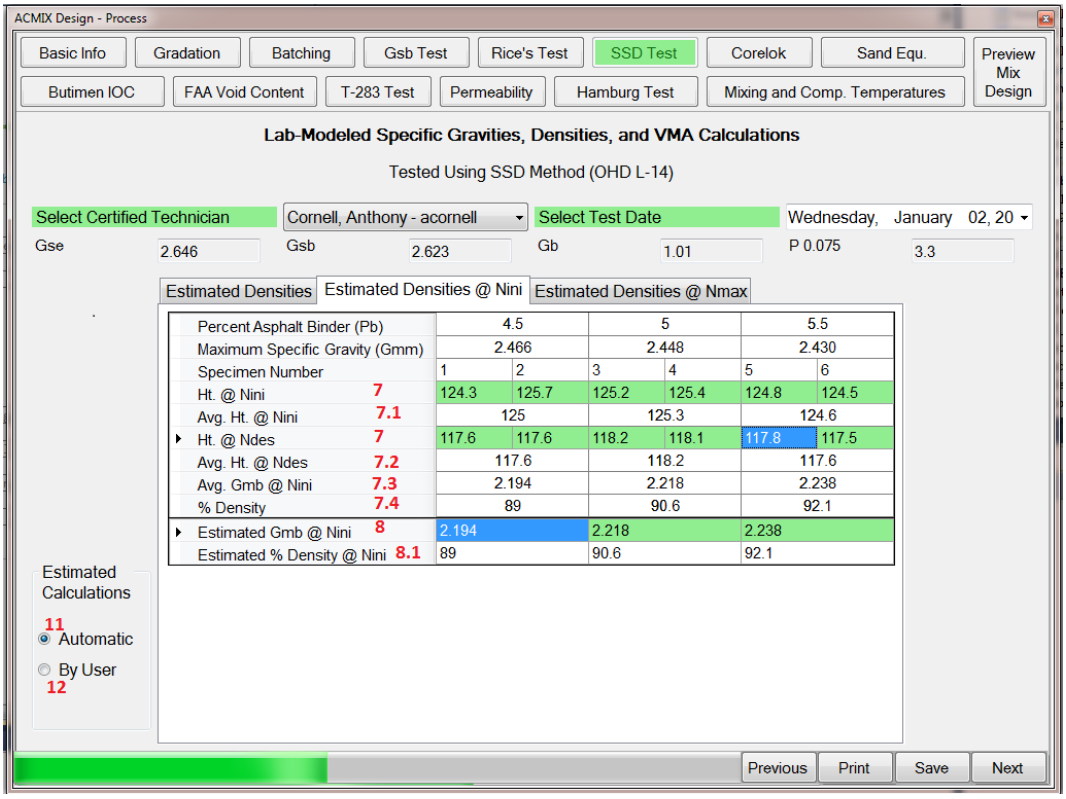
6) calculateGse()- First Calls Method CalculateGmm() and Checks if the %Ac, Gb and Average Gmm are not Null and calculates Gse

SubMethod

CalculateGmm()

SSD Test Tab


ACMIX Design - Process
Basic Info
Gradation
Batching
Gsb Test
Rice's Test
SSD Test
Corelok
Sand Equ.
Submit
Butimen IOC
FAA Void Content
T-283 Test
Permeability
Hamburg Test
Mixing and Comp. Temperatures
Lab-Modeled Specific Gravities, Densities, and VMA Calculations
Tested Using SSD Method (OHD L-14)
Select Certified Technician
Cornell, Anthony
1
Select Test Date
Tuesday , December 04, 20
Gse
4
2.646
Gsb
2.623
Gb
5
1.01
P 0.075
3.3
2
Estimated Densities
Estimated Densities @ Nini
Estimated Densities @ Nmax
Percent Asphalt Binder (Pb)
3
4.5
5
5.5
Maximum Specific Gravity (Gmm)
2.466
2.448
2.43
Specimen Number
1
2
3
4
5
6
Air Weight
4808
4817.2
4833.4
4832.4
4859.5
4856.9
Water Weight
6
2750.5
2762.4
2780.9
2783.2
2813.8
2809.7
SSD Weight
4812.2
4827.8
4837.6
4838.1
4862.2
4859.4
Bulk Specific Gravity (Gmb)
6.1
2.332
2.332
2.35
2.352
2.372
2.37
Average Gmb
6.2
2.332
2.351
2.371
% Absorption
6.3
0.2
0.5
0.2
0.3
0.1
0.1
% Density
6.4
94.6
96
97.6
% VMA
6.5
15.1
14.9
14.6
Estimated Gmb
2.332
2.351
2.371
Estimated % Density
6.6
94.6
96
97.6
Estimated % VMA
6.7
15.1
14.9
14.6
Estimated % VFA
6.8
64.2
73.2
83.6
Estimated Pbe
6.9
4.2
4.7
5.2
Estimated DP
6.10
0.8
0.7
0.6
Previous
Print
Save
Next


ACMIX Design - Process
Basic Info
Gradation
Batching
Gsb Test
Rice's Test
SSD Test
Corelok
Sand Equ.
Preview Mix Design
Butimen IOC
FAA Void Content
T-283 Test
Permeability
Hamburg Test
Mixing and Comp. Temperatures
Lab-Modeled Specific Gravities, Densities, and VMA Calculations
Tested Using SSD Method (OHD L-14)
Select Certified Technician
Cornell, Anthony - acornell
Select Test Date
Wednesday, January 02, 20
Gse
2.646
Gsb
2.623
Gb
1.01
P 0.075
3.3
Estimated Densities
Estimated Densities @ Nini
Estimated Densities @ Nmax
Percent Asphalt Binder (Pb)
4.5
5
5.5
Maximum Specific Gravity (Gmm)
2.466
2.448
2.430
Specimen Number
1
2
3
4
5
6
Ht. @ Nini
7
124.3
125.7
125.2
125.4
124.8
124.5
Avg. Ht. @ Nini
7.1
125
125.3
124.6
Ht. @ Ndes
7
117.6
117.6
118.2
118.1
117.8
117.5
Avg. Ht. @ Ndes
7.2
117.6
118.2
117.6
Avg. Gmb @ Nini
7.3
2.194
2.218
2.238
% Density
7.4
89
90.6
92.1
Estimated Gmb @ Nini
8
2.194
2.218
2.238
Estimated % Density @ Nini
8.1
89
90.6
92.1
Estimated Calculations
11
Automatic
By User
12
Previous
Print
Save
Next

Description

This form Enables you to calculate Estimated Densities of Nini and Nmax.

This Form automatically populates db, Pb and Gmm Values into the DataGrid View Table

Methods

1) populateCmbCertifiedTechnician()- Populates the Certified Technician data into the Combobox.

2) populateDBdata()- Populates the Percent Asphalt Binder(Pb) into the Buffer table.

3) populatePbdata()- Populates the Percent Asphalt Binder(Pb) into the Buffer table

4) txtGse_TextChanged- This Event Detects a Text Change in Gse and calls the method calculateGmm()- Calculates Maximum Specific Gravity(Gmm)

5) txtGb_TextChanged()- This Event Detects a Text change in Gb and Calls the method calculateGmm()

6) dgvSSD1_CellValueChanged()- This Event detects a change in the Cell Value and performs the operation dgvSSD1

SubMethods

dgvSSD1_DataError()-Detect data type errors in the dgvNini1 DataGridView and Pops out an Error Message "Please Enter a numeric Value"

dgvSSD2_CellValueChanged()- This Event Detects a change in the Cell Value and performs the operation dgvSSD2

dgvSSD2_DataError()-Detect data type errors in the dgvNini1 DataGridView and Pops out an Error Message "Please Enter a numeric Value"

calculateSSD1()- Executes or update the cells by Calling the methods

SubMethods

6.1 calculateGmbSSD()- Calculates Gmb using the Formulae Gmb = Air / (SSD - Water).

6.2 calculateAvgGmbSSD()- Calculates Average Gmb

6.3 calculateAbsorptionSSD()-Caclculate Absorptionusing the Formulae Absorption = 100 * (SSD - Air) / (SSD - Water)

6.4 calculatePtDensitySSD()-Calculate Percent Density using the Formulae Density = 100 * Gmb / Gmm

6.5 calculatePtVMASSD()-Calculate Percent VMA using the formula % VMA = 100 * (Gmb / Gsb) * (100 - Pb)

SubMethods

calculateSSD2()- Executes or Updates the the cells by calling the methods

SubMethods:

6.6 calculatePtDensitySSD2()- Calculates % Density using appropriate calculations % Gmm = 100 * Gmb / Gmm

6.7 calculatePtVMASSD2()-Calculate Percent VMA using appropriate Calculations % VMA = 100 * (Gmb / Gsb) * (100 - Pb)

6.8 calculatePtVFASSD2()-Calculate Percent VFA
% VFA = ROUND(100*((%VMA-(100-%Gmm))/%VMA),1) Or IsDBNull() Or IsNothing()

6.9 calculatePbeSSD2()-Calculates Pbe using appropriate Calculations
Pbe = ROUND(Pb-((Gse-Gsb)/(Gse*Gsb))*((100-Pb)*Gb),1)

6.10 calculateDPSSD2()- Calculate DP using appropriate calculations

DP = ROUND(P0075/Pbe,1)

7) dgvNini1_CellValueChanged()- This Event detects a Text change in cell and Performs operation dgvNini

dgvNini1_DataError()-Detect data type errors in the dgvNini1 DataGridView and act accordingly

SubMethods:

calculateNini()-

SubMethods:

7.1 calculateAvgHtNini()- Calculates Avg. Ht. @ nini using appropriate Calculations.

7.2 calculateAvgHtNdes()- Calculates Avg. Ht. @ ndes using appropriate Calculations.

7.3 calculateAvgGmbNini()-Calculates Avg. ht. @ ndes using appropriate Calculations.

7.4 calculatePtDensityNini()- Calculates percent Density using appropriate Calculations.

calculatePtDensityNini2()-Calculate Percent Density using formulae

% Gmm = 100 * Gmb / Gmm

8) dgvNini2_CellValueChanged()- Performs appropriate Calculations based upon the change in the cell "Estimated Gmb @ Nini"

SubMethods:

8.1 calculatePtDensityNini2()-Calculate Percent Density using formulae

% Gmm = 100 * Gmb / Gmm

9) dgvNmax1_CellValueChanged()- Performs approopriate calculations based upon the Change in the cell Air Weight, Water Weight and SSD Weight.

dgvNmax1_DataError- Detect Data Errors and Act accordingly

SubMethods:

calculateNmax()-

SubMethods

calculateGmbNmax()-Calculate Gmb @ Nmax
Gmb = Air / (SSD - Water)

calculateAvgGmbNmax()-Calculate Average Gmb @ Nmax

calculateAbsorptionNmax()-Caclculate Absorption @ Nmax
Absorption = 100 * (SSD - Air) / (SSD - Water)

calculatePtDensityNmax()-Calculate Percent Density @ Nmax
Density = 100 * Gmb / Gmm

10) dgvNmax2_CellValueChanged- Performs appropriate Calculations based upon the Change in the cell "Estimated Gmb @Nmax"

dgvNmax2_DataError- Detect Data Errors and Act accordingly

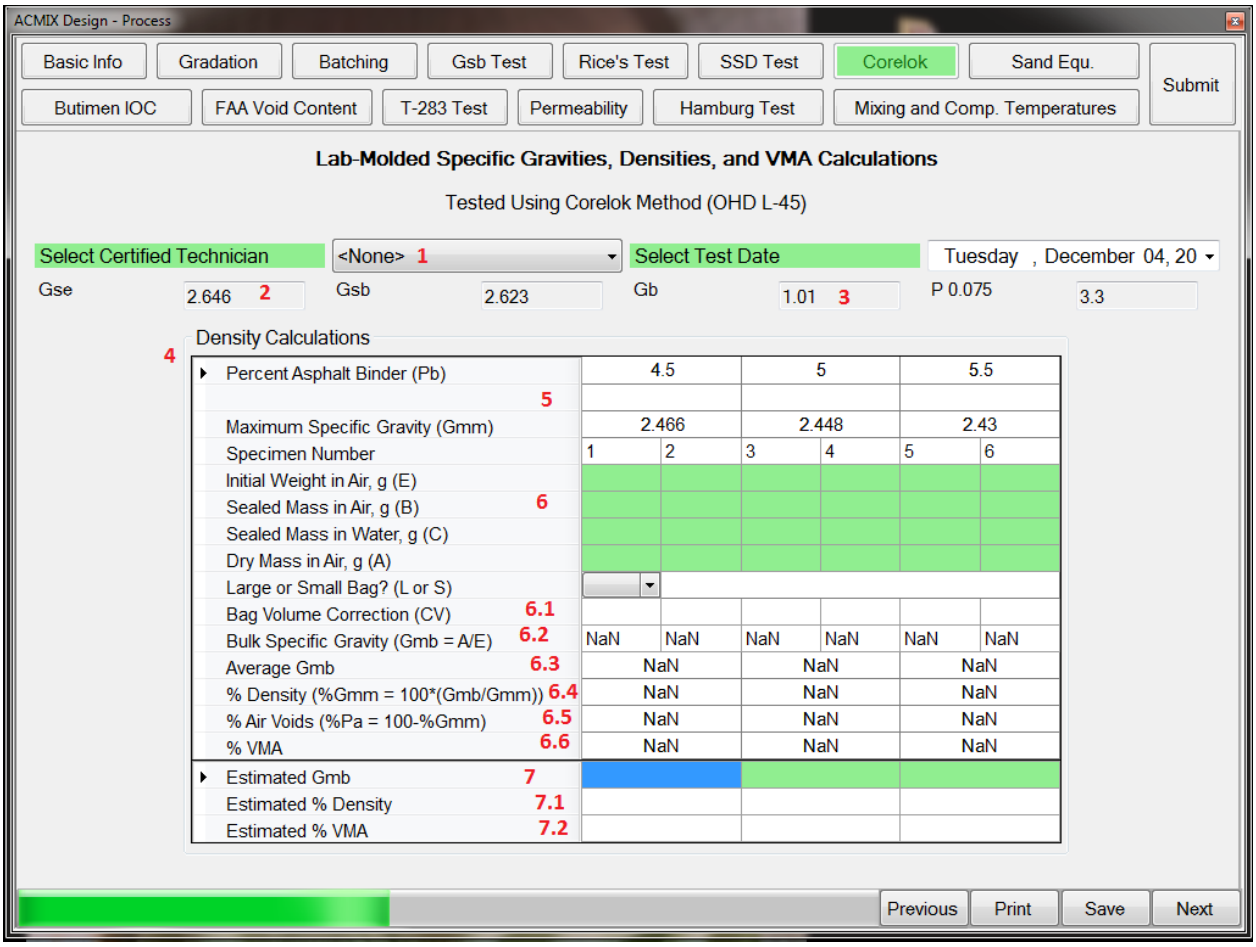
SunMethods

calculatePtDensityNmax2()-Calculate Percent Density @ Nmax
Density = 100 * Gmb / Gmm

11) rbAutomatic_CheckedChanged- Detect a radio button change in rbAutomatic and Set the appropriate format.

12) rbUser_CheckedChanged- Detect a radio button change in rbUser and Set the appropriate format.

Corelok Tab



Description

This form enables the user to calculate % Density, % VMA

Methods

1) populateCmbCertifiedTechnician()- Populates the Certified Technician data into the Combobox.

2) txtGse_TextChanged- This Event Detects a Text Change in Gse and calls the method

calculateGmmCorelok()-Calculate Gmm
ROUND(100/(((100-(Pb+Pcf))/Gse)+(Pb/Gb)+(Pcf/GmmPcf)),3)

ROUND(100/(((100-Pb)/Gse)+(Pb/Gb)),3)

3) txtGb_TextChanged()- This Event Detects a Text change in Gb and Calls the method

calculateGmmCorelok()-Calculate Gmm
ROUND(100/(((100-(Pb+Pcf))/Gse)+(Pb/Gb)+(Pcf/GmmPcf)),3)
ROUND(100/(((100-Pb)/Gse)+(Pb/Gb)),3)

4) populateTable()- Populates the Table with appropriate controls and data.

5) populatePf()- Populates the field percent Cellulose Fiber

calculateGmmCorelok()- Calculate Gmm
ROUND(100/(((100-(Pb+Pcf))/Gse)+(Pb/Gb)+(Pcf/GmmPcf)),3)
ROUND(100/(((100-Pb)/Gse)+(Pb/Gb)),3)

6) dgvCorelok1_CellValueChanged- Performs appropriate Calculations based on the changes in the cell

dgvCorelok1_DataError- Detects Data Errors and act accordingly

SubMethods

calculateCorelok()-

SubMethods

6.1) calculateCVCorelok()-Calculate Bag Volume Correction using the formulae

L
ROUND(0.8596-((0.00166*A)/(B-E)),3),

S
ROUND(0.8121-((0.000566*A)/(B-E)),3),""))

6.2) calculateGmbCorelok()-Calculate Gmb

Gmb = ROUND(A/((B-C)-((B-E)/CV)),3),"")

6.3) calculateAvgGmbCorelok()- Calculates average Gmb

6.4) calculatePtDensityCorelok()-Calculate Percent Density

% Density = 100 * Gmb / Gmm

6.5) calculatePtAirVoidsCorelok()-Calculate Percent Air Voids

% Pa = 100 - % Density

6.6) calculatePtVMACorelok()-Calculate Percent VMA

% VMA = ROUND(100-((AvrGmb/Gsb)*(100-(Pb+Pf)))

calculatePtDensityCorelok2()-Calculate Percent Density

% Density = 100 * Gmb / Gmm

calculatePtVMACorelok2()-Calculate Percent VMA

% VMA = ROUND(100-((AvrGmb/Gsb)*(100-(Pb+Pf)))

7) rbUser_CheckedChanged- This event detects a change in the radio button user and sets the Appropriate Format.

dgvCorelok2_CellContentClick- If the user radio button is checked and Detects change in the Estimated Gmb it calls the methods

dgvCorelok2_DataError- Detects data errors and act accordingly

SubMethods

7.1) calculatePtDensityCorelok2()-Calculate Percent Density

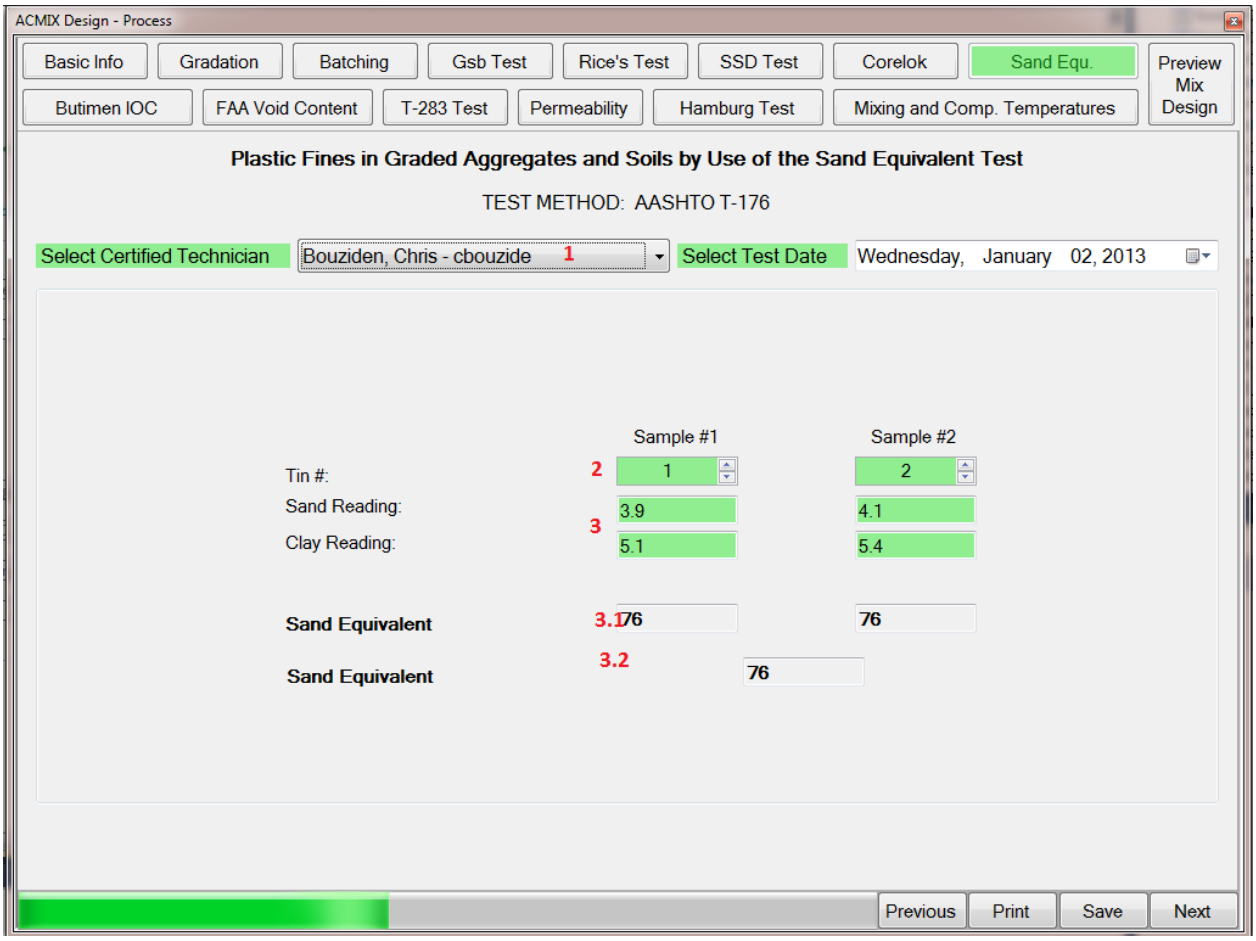
% Density = 100 * Gmb / Gmm

7.2) calculatePtVMACorelok2()-Calculate Percent VMA

% VMA = ROUND(100-((AvrGmb/Gsb)*(100-(Pb+Pf)))

8) rbAutomatic_CheckedChanged- This event detects a change in the radio button Automatic and sets the Appropriate Format.

Sand Equivalent Tab



Description

This form enables the user to calculate Sand equivalent

Methods

1) populateCmbCertifiedTechnician()- Populates the Certified Technician data into the Combobox.

2) nudtinNumber1_ValueChanged- Detect a value change in nudtinNumber1 NumericUpDown control and perfom the appropriate actions.

2.1) calculateSandEqu()- If Sand Reading and Clay Reading is not Null, it calculates the Sand Equivalent

2.2) txtAverageSandEquivalent_TextChanged- Detects a change in text Sand Equivalent and calculates Average Sand Equivalent

3) txtclayReading2_TextChanged - Detects a change in text Sand Reading, Clay Reading and performs appropriate actions

3.1) calculateSandEqu()-If Sand Reading and Clay Reading is not Null, it calculates the Sand Equivalent

3.2) txtAverageSandEquivalent_TextChanged- Detects a change in text Sand Equivalent and calculates Average Sand Equivalent

Butimen IOC Tab

Description

This form enables the user to calculate %Loss, %IOC and % Average IoC

Methods

1) populateCmbCertifiedTechnician()- Populates the Certified Technician data into the Combobox.

2) nud_ValueChanged- Detect a NumericUpDown control value change and perform the appropriate actions.

calculatePtIOC()

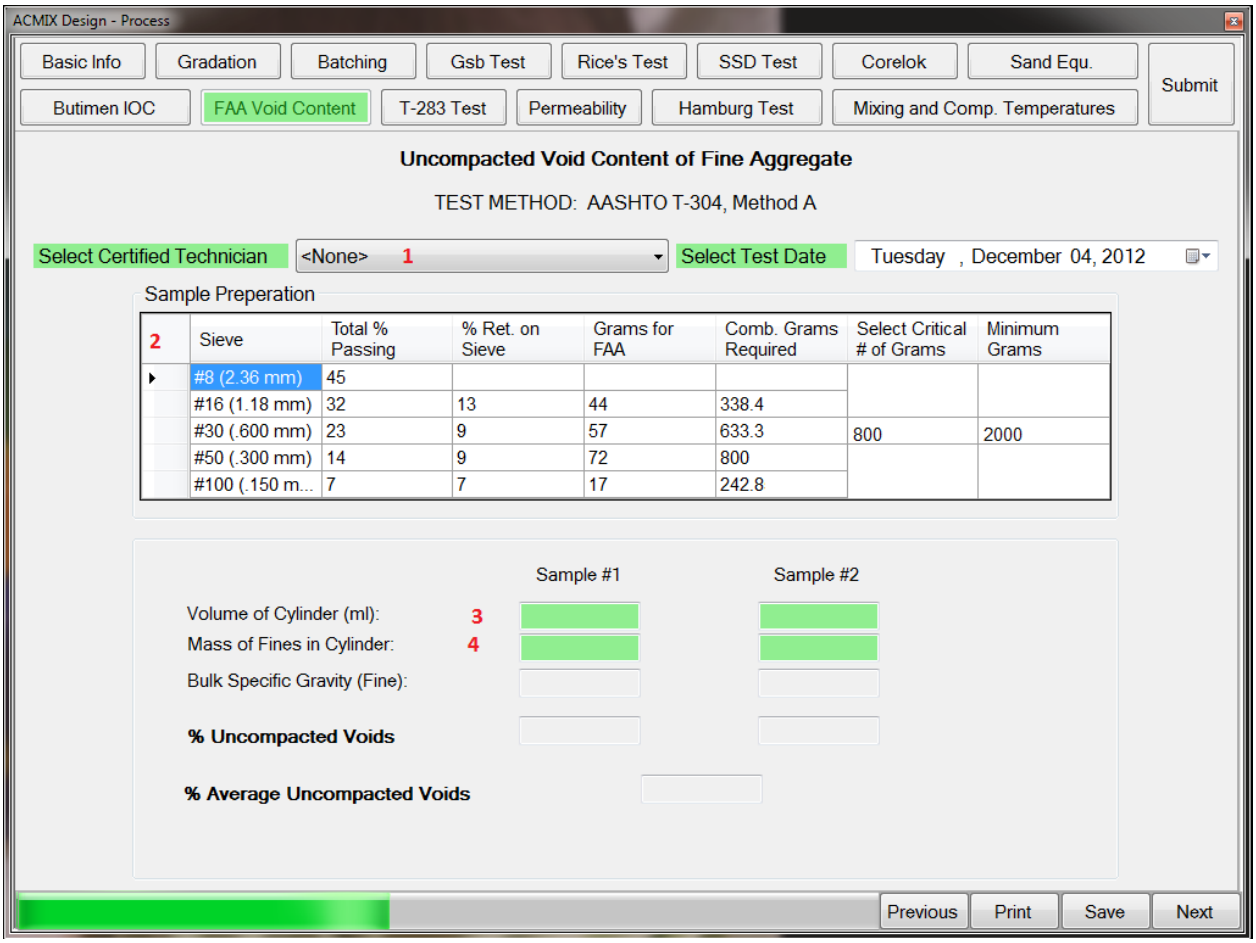
3) txtBox_TextChanged- Detects a change in text Sample Weight and Weight Loss and performs appropriate actions.

calculatePtIOC()- Calculates Loss%, %IOC and Average %IOC if Sample Weight and Weight Loss is not equal to Null

4) txtAveragePtIOC_TextChanged

calculatePtIOC()- Calculates %IOC and Average %IOC

FAA Void Tab



Description

This form is used to calculate % Uncompacted voids and % Average Uncompacted Voids

Methods

1) populateCmbCertifiedTechnician()- Populates the Certified Technician data into the Combobox.

2) populate_dgvFAA()- Populates the dataGrid with appropriate data from the database.

dgvFAA_CellFormatting- Override the cell formatting method of the dgvAggregateGradations2 control for appropriate decimal number rounding.

dgvFAA_CellPainting- Override the cell painting method of the dgvDust control for vertical cell merge.

3) txtCylVol1_TextChanged- Detects a change in textbox and calls the methods
txtCylVol2_TextChanged- Detects a change in textbox and calls the methods

SubMethods

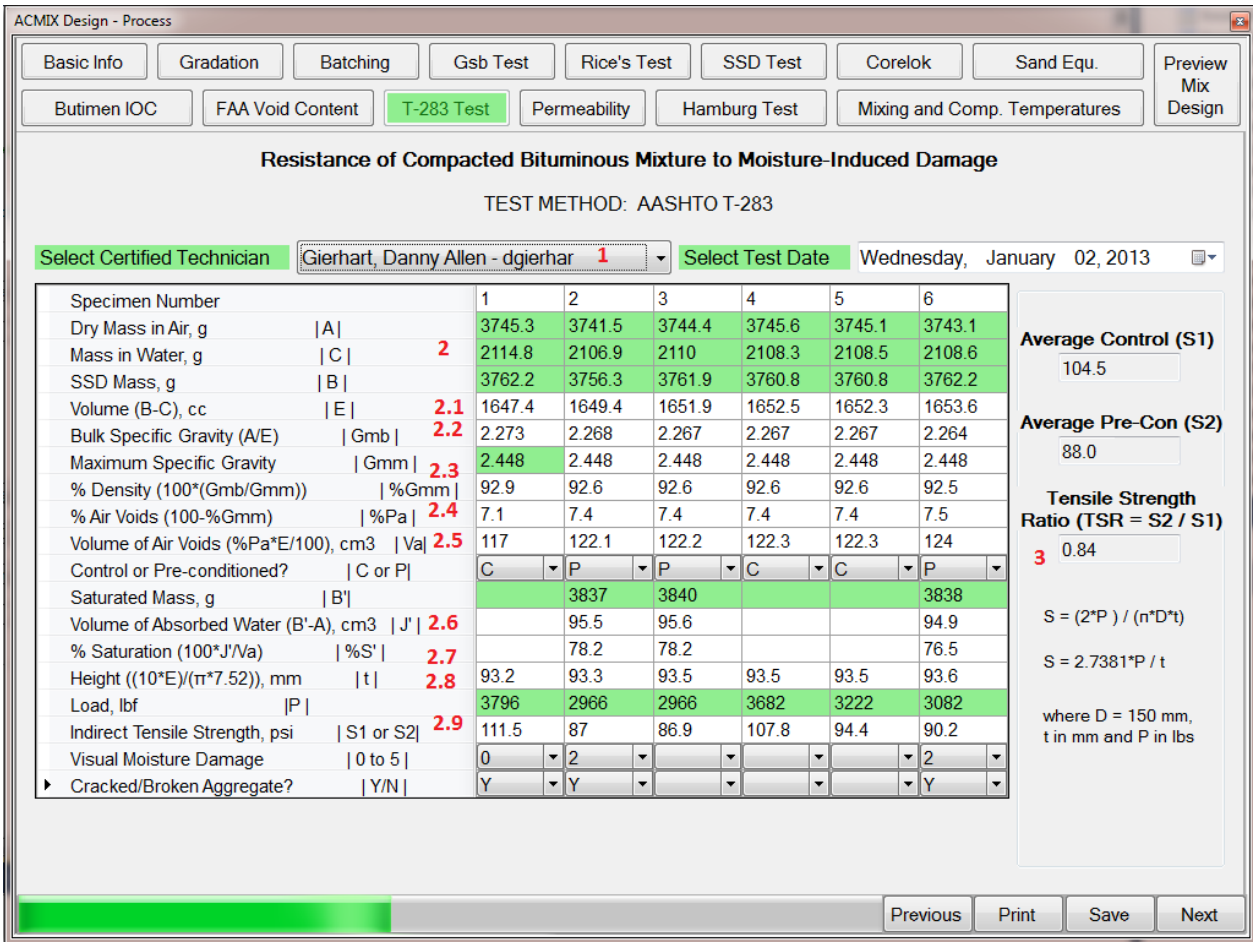
3.1) calculateVoids()- calculates Uncompacted voids for Sample1, Sample2 and also calculates Average Uncompacted Voids

4) txtCylFinesMass1_TextChanged- Detects a change in textbox and calls the methods
txtCylFinesMass2_TextChanged- Detects a change in textbox and calls the methods

SubMethod

calculateVoids()- calculates Uncompacted voids for Sample1, Sample2 and also calculates Average Uncompacted Voids

T-283 Test Tab



Description

This form enables the user to calculate Average Control(S1), Average Pre Control(S2) and Tensile Strength Ratio.

Methods

1) populateCmbCertifiedTechnician()- Populates the Certified Technician data into the Combobox.

2) dgvT283_CellValueChanged- Perform the appropriate calculation upon a cell value change in dgvT283

dgvPermeability_DataError- Detects data errors and Handles to dgvT283

SubMethods:

calculateT283()

SubMethods:

2.1) calculateVolume()-Calculate volume E = B - C

2.2) calculateGmbT283()-Calculate Gmb = A / E

2.3) calculatePtGmm()-Calculate Percent Density or % Gmm

% Gmm = 100 * Gmb / Gmm

2.4) calculatePtAirVoids()-Calculate Percent Air Voids

% Pa = 100 - % Gmm

2.5) calculateVolumeAirVoids()-Calculate volume air voids Va = %Pa * E / 100

2.6) calculateVolumeAbsorbedWater()-Calculate volume of absorbed water

J' = B' - A

2.7) calculatePtSaturation()-Calculate percent saturation %S' = 100 * J' / Va

2.8) calculateHeight()-Calculate Height t = ((10*E)/(π*7.52))

2.9) calculateTensileStrength()-Calculate Tensile Strength

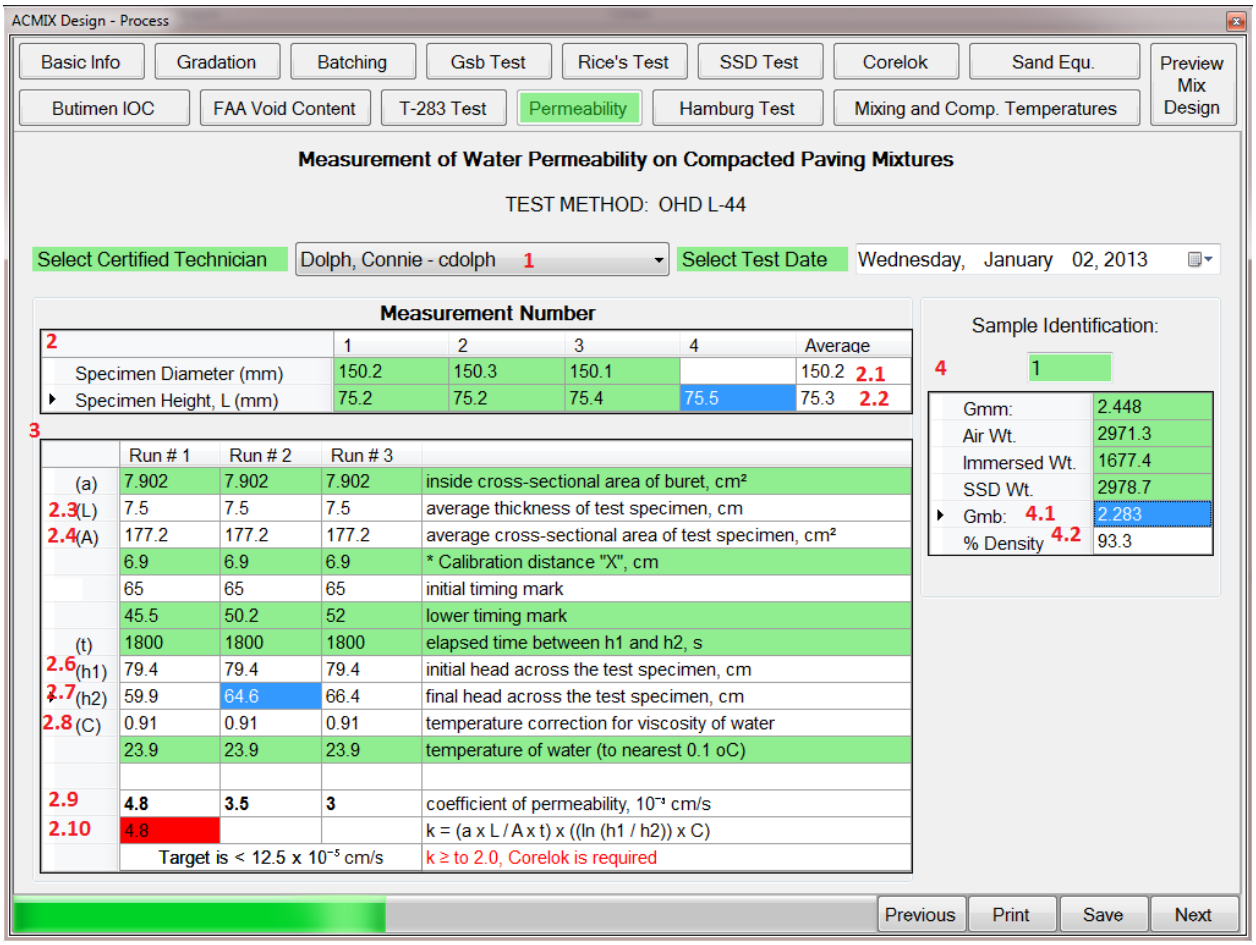
(2000 * 4.4482216 * P / (150 * t * 3.14159)) * 0.1450377)

3) calculateTSR()- Calculates Tensile Strength Ratio from S1 and S2.

txtTSR_TextChanged- Detects a change in TextTSR and performs appropriate actions

txtS2_TextChanged- Detects a change in S2 and performs appropriate actions

Permeability Tab



Methods

1) populateCmbCertifiedTechnician()- Populates the Certified Technician data into the Combobox.

2) dgvPermeability1_CellValueChanged- Detect a change in Specimen Diameter, Specimen Height and performs appropriate actions.

dgvPermeability1_DataError- Detects the error and act accordingly

calculatePermeability()

SubMethods

2.1) calculateAverageDiameter()- Calculates Average Diameter

2.2) calculateAverageHeight()- Calulates Average Height

2.3) calculateThickness()-Calculate thickness L (cm) = AverageL (mm) / 10

2.4) calculateAverageArea()-Calculate average area

(PI()*(($H$13/10)/2)^2))

2.6) calculateHead1()- Calculate head1 = B20+B22+B23

2.7) calculateHead2()-Calculate head2 = B20+B22+B24

2.8) calculateTempCorr()- Calculates the Temperature correction for viscosity of water

2.9) calculateCoeffPermeability()- Calculates Coefficient of permeability
(100000*(ROUND(((B19*B20)/(B21*B25))*LN(B26/B27)*B28,10)))

2.10) calculateMaxK()-Calculate the maximum K value (maximum of 3 runs)

3) dgvPermeability2_CellValueChanged- Detects a change in (a),Calibration distance, lower timing mark, elapsed time, temperature of water and performs appropriate actions.

dgvPermeability2_DataError- Detects the error and act accordingly

calculatePermeability()

4) dgvPermeability3_CellValueChanged- Detects a change in Air Wt., Immersed Wt. and SSD Wt. and performs appropriate actions.

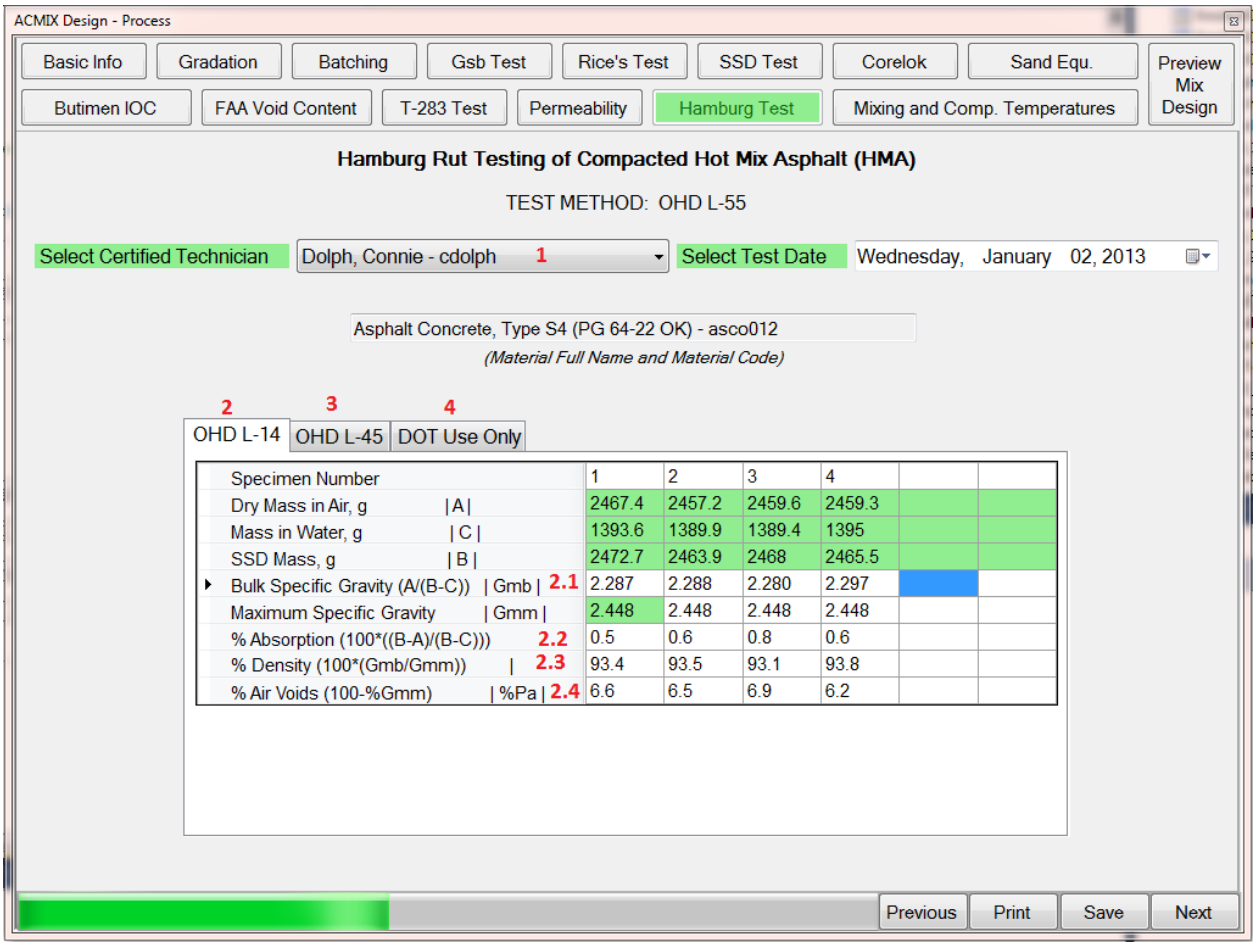
dgvPermeability3_DataError- Detects the error and act accordingly

SubMethods

4.1) calculateGmb3()- Calculates Gmb

4.2) calculatePtDensity3()- Calculates % Density

Hamburg Test Tab



Methods

1) populateCmbCertifiedTechnician():Populates the Certified Technician data into the Combobox.

2) dgvOHDL14_CellValueChanged : Detects a change in dgvOHDL14 Cell Value and populates GMM by calling methods

dgvOHDL14_DataError- Detects an error in dgvOHDL14 and acts accordingly

SubMethods

populateGmm14()- Populates the values of Gmm

calculateOHDL14() Calculates the Value of Gmm14

SubMethods

2.1) calculateGmb14()-Calculates the Value of Gmm14

2.2) calculateAbsorption14()- Calculates Absorption14 values

2.3) calculatePtDensity14()- Calculates % density

2.4) calculatePtPa14()- Calculates % Pa(% Air Voids)

3) dgvOHDL45_CellValueChanged- Detects a change in dgvOHDL45 and calls the methods

dgvOHDL45_DataError- Detects an error and acts accordingly

SubMethods

populateGmm45()- populates OHDL-45 values

calculateOHDL45()-

SubMethods

populateBagSize45()- populates the field "Large or Small Bag"

calculateCV45()- Calculates the Bag Volume Correction

calculateGmb45()- Calculates Bulk Specific Gravity

populateGmm45()- Populates the field Maximum Specific Gravity

calculatePtDensity45()- Calculates % Density

calculatePtPa45()- Calculate % Air Voids

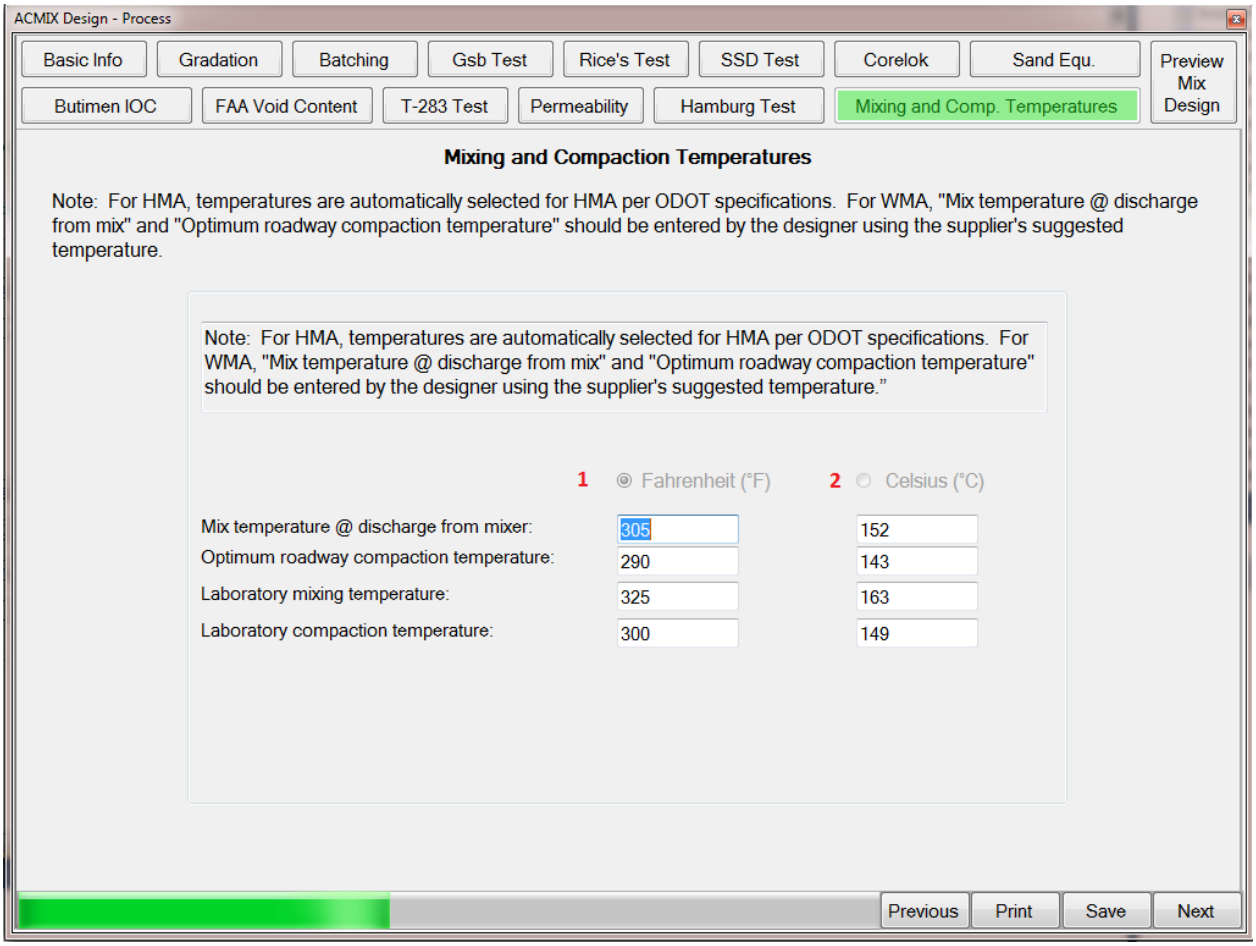
4) dgvRut1_CellValueChanged- Detects a change in the Rut Depth and calls the methods

dgvRut1_DataError- Detects an error and acts accordingly.

SubMethods

calculateRequiedNumberofPasses()- Calculates the Required passes

Mixing and Compaction Temperatures Tab



Description

This form populates the temperatures based on the change in the radio buttons

Methods

1) rbFahrenheit_CheckedChanged- Detect a radio button change in rbFarenheit and perform the appropriate calculations

SubMethods:

organizeUI()- populates all the fields in the form
convertUnits()- converts the temperatures between Celsius and Fahrenheit

2) rbCelsius_CheckedChanged- Detect a radio button change in rbCelsius and perform the approriate calculations

SubMethods:

organizeUI()- populates all the fields in the form
convertUnits()- converts the temperatures between Celsius and Fahrenheit

Appendix D: Comprehensive Documentation Class Libraries

clsCalculate Class

The clsCalculate class contains the functions that are used to compute mix properties such as Gmm, Gse, etc.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax

C#
public class clsCalculate
Visual Basic
Public Class clsCalculate
Visual C++
public ref class clsCalculate

Inheritance Hierarchy

System.Object
  VB_ODOT_ACMIX.clsCalculate

clsCalculate Members

The clsCalculate type exposes the following members.

Constructors

Name	Description
clsCalculate	Initializes a new instance of the clsCalculate class

Methods

Name	Description
Gmm	Calculate Maximum Specific Gravity (Gmm) Gmm = 100 / ((100 - Pb) / Gse + Pb / Gb)
Gse	Calculate Gse Gse = (100 - Pb) / (100 / Gmm - Pb / Gb) ROUND((100-(Pb+Cf))/((100/Gmm)-((Pb/Gb)+(Cf/Gf))),3)
IR	Calculate Insoluble Residue (IR) IR = Round((PtIR/100)*(PtPb)*((100-PtPass8)/100)/((100-PtPass8Comb)/100), 1)

clsCorelok Class

Contains properties and methods to retrieve as well as insert Corelok information into a datatable ready for database insert.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax

C#
public class clsCorelok
Visual Basic
Public Class clsCorelok
Visual C++
public ref class clsCorelok

Inheritance Hierarchy

System.Object
  VB_ODOT_ACMIX.clsCorelok

clsCorelok Members

The clsCorelok type exposes the following members.

Constructors

Name	Description
clsCorelok	Creates a new instance of the clsCorelok class

Methods

Name	Description
GetasphaltBinderPt	Get a value for asphaltBinderPt
GetdryAirMass	Get a value for dryAirMass
GetestimatedGmb	Get a value for estimatedGmb
GetidCoreLokSample	Get a value for idCoreLokSample
GetinitialAirWt	Get a value for initialAirWt
GetisSmallBag	Get a value for isSmallBag
GetmixDesignTest_id	Get a value for mixDesignTest_id
GetsealedAirMass	Get a value for sealedAirMass
GetsealedWaterMass	Get a value for sealedWaterMass
SetasphaltBinderPt	Set the value of asphaltBinderPt
SetdryAirMass	Set the value of dryAirMass
SetestimatedGmb	Set the value of estimatedGmb
SetidCoreLokSample	Set the value of idCoreLokSample
SetinitialAirWt	Set the value of initialAirWt

Name	Description
SetisSmallBag	Set the value of isSmallBag
SetmixDesignTest_id	Set the value of mixDesignTest_id
SetsealedAirMass	Set the value of sealedAirMass
SetsealedWaterMass	Set the value of sealedWaterMass

clsFAATest Class

Contains properties and methods to retrieve as well as insert FAA test information into a datatable ready for database insert.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
public class clsFAATest
Visual Basic
Public Class clsFAATest
Visual C++
public ref class clsFAATest

Inheritance Hierarchy
System.Object
  VB_ODOT_ACMIX.clsFAATest

clsFAATest Members

The clsFAATest type exposes the following members.

Constructors

Name	Description
clsFAATest	Creates a new instance of the clsFAATest class.

Methods

Name	Description
GetcylinderVolumn	Get a value for cylinderVolumn
GetfineMass	Get a value for fineMass
GetidFaatestSample	Get a value for idFaatestSample
GetmixDesignTest_id	Get a value for mixDesignTest_id
SetcylinderVolumn	Set the value of cylinderVolumn
SetfineMass	Set the value of fineMass
SetidMixAggregate	Set the value of idFaatestSample
SetmixDesignTest_id	Set the value of mixDesignTest_id

clsGSBTest Class

Contains properties and methods to retrieve as well as insert GSB test information into a datatable ready for database insert.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
public class clsGSBTest
Visual Basic
Public Class clsGSBTest
Visual C++
public ref class clsGSBTest

Inheritance Hierarchy
System.Object
  VB_ODOT_ACMIX.clsGSBTest

clsGSBTest Members

The clsGSBTest type exposes the following members.

Constructors

Name	Description
clsGSBTest	Creates a new instance of the clsFAATest class.

Methods

Name	Description
GetcoarseImmersedWt	Get a value for coarseImmersedWt
GetcoarseOvenDryWt	Get a value for coarseOvenDryWt
GetcoarseSaturatedSurfaceDryWt	Get a value for coarseSaturatedSurfaceDryWt
GetfineOvenDryWt	Get a value for fineOvenDryWt
GetfinePycnometerSpecimenWaterWt	Get a value for finePycnometerSpecimenWaterWt
GetfinePycnometerWaterWt	Get a value for finePycnometerWaterWt
GetfineSaturatedSurfaceDryWt	Get a value for fineSaturatedSurfaceDryWt
GetidGsbtestSample	Get a value for idGsbtestSample
GetmixDesignTest_id	Get a value for mixDesignTest_id
SetcoarseImmersedWt	Set the value of coarseImmersedWt
SetcoarseOvenDryWt	Set the value of coarseOvenDryWt
SetcoarseSaturatedSurfaceDryWt	Set the value of coarseSaturatedSurfaceDryWt
SetfineOvenDryWt	Set the value of fineOvenDryWt
SetfinePycnometerSpecimenWaterWt	Set the value of finePycnometerSpecimenWaterWt

Name	Description
SetfinePycnometerWaterWt	Set the value of finePycnometerWaterWt
SetfineSaturatedSurfaceDryWt	Set the value of fineSaturatedSurfaceDryWt
SetidGsbtestSample	Set the value of idGsbtestSample
SetmixDesignTest_id	Set the value of mixDesignTest_id

Fields

Name	Description
md_tblGSBTest	

clsIOCTest Class

Contains properties and methods to retrieve as well as insert IOC test information into a datatable ready for database insert.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
public class clsIOCTest
Visual Basic
Public Class clsIOCTest
Visual C++
public ref class clsIOCTest

Inheritance Hierarchy
System.Object
  VB_ODOT_ACMIX.clsIOCTest

clsIOCTest Members

The clsIOCTest type exposes the following members.

Constructors

Name	Description
clsIOCTest	Creates a new instance of the clsCorelok class.

Methods

Name	Description
GetasphaltBinderPt	Get the value of asphaltBinderPt.
GetcompensationTemp	Get the value of compensationTemp
GetelapsedTime	Get the value of elapsedTime
GetidIoctestSample	Get the value of idIoctestSample
GetlossWt	Get the value of lossWt.
GetmixDesignTest_id	Get the value of mixDesignTest_id
GetsampleWt	Get the value of sampleWt
SetasphaltBinderPt	Set the value of asphaltBinderPt
SetcompensationTemp	Set the value of compensationTemp
SetelapsedTime	Set the value of elapsedTime
SetidIoctestSample	Set the value of idIoctestSample
SetlossWt	Set the value of lossWt
SetmixDesignTest_id	Set the value of mixDesignTest_id
SetsampleWt	Set the value of sampleWt

Fields

Name	Description
md_tblIOCTest	

clsMixAggregate Class

Contains properties and methods to retrieve as well as insert Mix Aggregates information into a datatable ready for database insert.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
public class clsMixAggregate
Visual Basic
Public Class clsMixAggregate
Visual C++
public ref class clsMixAggregate

Inheritance Hierarchy
System.Object
  VB_ODOT_ACMIX.clsMixAggregate

clsMixAggregate Members

The clsMixAggregate type exposes the following members.

Constructors

Name	Description
clsMixAggregate	Creates a new instance of the clsMixAggregate class.

Methods

Name	Description
AddAggregate	Insert a new record into the aggregate table.
GetacPt	Get the value of acPt.
GetAggregateType_id	Get the value of idMixAggregate.
GetBatchingInsolubleResidueWt	Get the value of batchingInsolubleResidueWt
GetBatchingUsedPt	Get the value of batchingUsedPt
GetdryWt	Get the value of dryWt
GetdurabilityIndex	Get the value of durabilityIndex
GetflatElong	Get the value of flatElong
GetfracturedFaces1MorePt	Get the value of fracturedFaces1MorePt
GetfracturedFaces2MorePt	Get the value of fracturedFaces2MorePt
GetidMixAggregate	Get the value of idMixAggregate
GetlaAbrasion	Get the value of laAbrasion
GetmicroDeval	Get the value of microDeval
GetmixDesign_id	Get the value of mixDesign_id
GetproductSupplier_id	Get the value of productSupplier_id

Name	Description
GetretainedInPanWt	Get the value of retainedInPanWt
GetwashedWt	Get the value of washedWt
SetacPt	Set the value of acPt
SetAggregateType_id	Set the value of aggregateType_id
SetBatchingInsolubleResidueWt	Set the value of batchingInsolubleResidueWt
SetBatchingUsedPt	Set the value of batchingUsedPt
SetdryWt	Set the value of dryWt
SetdurabilityIndex	Set the value of durabilityIndex
SetflatElong	Set the value of flatElong
SetfracturedFaces1MorePt	Set the value of fracturedFaces1MorePt
SetfracturedFaces2MorePt	Set the value of fracturedFaces2MorePt
SetlaAbrasion	Set the value of laAbrasion
SetmicroDeval	Set the value of microDeval
SetmixDesign_id	Set the value of mixDesign_id
SetproductSupplier_id	Set the value of productSupplier_id
SetretainedInPanWt	Set the value of retainedInPanWt
SetwashedWt	Set the value of washedWt

Fields

Name	Description
md_tblMixAggregate	

clsMixAggregateGradation Class

Contains properties and methods to retrieve as well as insert Mix Aggregate Gradation information into a datatable ready for database insert.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
public class clsMixAggregateGradation
Visual Basic
Public Class clsMixAggregateGradation
Visual C++
public ref class clsMixAggregateGradation

Inheritance Hierarchy
System.Object
  VB_ODOT_ACMIX.clsMixAggregateGradation

clsMixAggregateGradation Members

The clsMixAggregateGradation type exposes the following members.

Constructors

Name	Description
clsMixAggregateGradation	Creates a new instance of the clsMixAggregateGradation class

Methods

Name	Description
AddAggGradation	
GetGradationPassPt	Get a value for gradationPassPt
GetGradationRetainedWt	Get a value for gradationRetainedWt
GetMixAggregate_id	Get a value for mixAggregate_id
GetSieve_id	Get a value for sieve_id
SetGradationPassPt	Set the value of gradationPassPt
SetGradationRetainedWt	Set the value of gradationRetainedWt
SetMixAggregate_id	Set the value of mixAggregate_id
SetSieve_id	Set the value of sieve_id

Fields

Name	Description
md_tblAggGrad	

clsMixBatch Class

Contains properties and methods to retrieve as well as insert Mix Aggregate Batching information into a datatable ready for database insert.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
public class clsMixBatch
Visual Basic
Public Class clsMixBatch
Visual C++
public ref class clsMixBatch

Inheritance Hierarchy
System.Object
  VB_ODOT_ACMIX.clsMixBatch

clsMixBatch Members

The clsMixBatch type exposes the following members.

Constructors

Name	Description
clsMixBatch	Creates a new instance of the clsMixBatch class

Methods

Name	Description
AddMixBatch	Insert new Batching Sand Equivalent data to the table
GetbatchAggregateWt	Get a value for batchAggregateWt
GetbatchSpecimenWt	Get a value for batchSpecimenWt
GetbatchType_id	Get a value for batchType_id
GetbatchWt	Get a value for batchWt
GetidMixBatch	Get a value for idMixBatch
GetmixDesign_id	Get a value for mixDesign_id
SetbatchAggregateWt	Set the value of batchAggregateWt
SetbatchSpecimenWt	Set the value of batchSpecimenWt
SetbatchType_id	Set the value of batchType_id
SetbatchWt	Set the value of batchWt
SetidMixBatch	Set the value of idMixBatch
SetmixDesign_id	Set the value of mixDesing_id

Fields

Name	Description
md_tblMixBatch	

clsMixBatchingSandEquivalent Class

Contains properties and methods to retrieve as well as insert Mix Batching Sand Equivalent information into a datatable ready for database insert. This class will have a DataTable for storing batching sand equivalent. It will also have functions or Subs to define the operations.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
public class clsMixBatchingSandEquivalent
Visual Basic
Public Class clsMixBatchingSandEquivalent
Visual C++
public ref class clsMixBatchingSandEquivalent

Inheritance Hierarchy
System.Object
  VB_ODOT_ACMIX.clsMixBatchingSandEquivalent

clsMixBatchingSandEquivalent Members

The clsMixBatchingSandEquivalent type exposes the following members.

Constructors

Name	Description
clsMixBatchingSandEquivalent	Creates a new instance of the clsMixBatchingSandEquivalent class

Methods

Name	Description
AddBatchingSandEquivalent	Creates a new instance of the clsCorelok class. Adding new Batching Sand Equivalent data to the table
GetincrementNumber	Get a value for incrementNumber
GetmixBatch_id	Get a value for mixBatch_id
GetsieveWt	Get a value for sieveWt
GettotalWt	Get a value for totalWt
SetincrementNumber	Set the value of incrementNumber
SetmixBatch_id	Set the value of mixBatch_id
SetsieveWt	Set the value of sieveWt
SettotalWt	Set the value of totalWt

Fields

Name	Description
md_tblMixBatchingSandEquivalent	

clsMixDesign Class

Contains properties and methods to retrieve as well as insert Mix Design information into a datatable ready for database insert.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
public class clsMixDesign
Visual Basic
Public Class clsMixDesign
Visual C++
public ref class clsMixDesign

Inheritance Hierarchy
System.Object
  VB_ODOT_ACMIX.clsMixDesign

clsMixDesign Members

The clsMixDesign type exposes the following members.

Constructors

Name	Description
clsMixDesign	Creates a new instance of the clsMixDesign class

Fields

Name	Description
md_tblMixDesign	

Properties

Name	Description
antistrip	Set or Get the value of antistrip
batchingOption	Set or Get the value of batchingOption
binder_id	Set or Get the value of binder_id
binderHighPt	Set or Get the value of binderHighPt
binderLowPt	Set or Get the value of binderLowPt
binderTargetPt	Set or Get the value of binderTargetPt
contract_id	Set or Get the value of contract_id
createdDate	Set or Get the value of createdDate
depthFromSurface	Set or Get the value of depthFromSurface
designType_id	Set or Get the value of designType_id

Name	Description
esal	Set or Get the value of esal
fiber	Set or Get the value of fiber
fiberPt	Set or Get the value of fiberPt
gradationEffectiveDate	Set or Get the value of gradationEffectiveDate
gradationOption	Set or Get the value of gradationOption
idMixDesign	Set or Get the value of idMixDesign
lab_id	Set or Get the value of lab_id
material_id	Set or Get the value of material_id
mixCategory	Set or Get the value of mixCategory
mixDesign_id	Set or Get the value of mixDesign_id
mixTypeCode	Set or Get the value of mixTypeCode
plant_id	Set or Get the value of plant_id
producerSupplier_id	Set or Get the value of producerSupplier_id
rutDepthTestType	Set or Get the value of rutDepthTestType
user_id	Set or Get the value of user_id

clsPermeability Class

Contains properties and methods to retrieve as well as insert Permeability information into a datatable ready for database insert.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
public class clsPermeability
Visual Basic
Public Class clsPermeability
Visual C++
public ref class clsPermeability

Inheritance Hierarchy
System.Object
  VB_ODOT_ACMIX.clsPermeability

clsPermeability Members

The clsPermeability type exposes the following members.

Constructors

Name	Description
clsPermeability	Creates a new instance of the clsPermeability class

Methods

Name	Description
GetcalibrationDistance	Get a value for calibrationDistance
GetcrossSectionalArea	Get a value for crossSectionalArea
GetelapsedTime	Get a value for elapsedTime
GetidPermeabilityTestRun	Get a value for idPermeabilityTestRun
GetlowerTimingMark	Get a value for lowerTimingMark
GetmixDesignTest_id	Get a value for mixDesignTest_id
GetwaterTemp	Get a value for waterTemp
SetcalibrationDistance	Set the value of calibrationDistance
SetcrossSectionalArea	Set the value of crossSectionalArea
SetelapsedTime	Set the value of elapsedTime
SetidPermeabilityTestRune	Set the value of idPermeabilityTestRun
SetlowerTimingMark	Set the value of lowerTimingMark
SetmixDesignTest_id	Set the value of mixDesignTest_id
SetwaterTemp	Set the value of waterTemp

Fields

Name	Description
md_tblPermeability	

clsPermeabilityDensitiesTest Class

Contains properties and methods to retrieve as well as insert Permeability Densities Test information into a datatable ready for database insert.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
public class clsPermeabilityDensitiesTest
Visual Basic
Public Class clsPermeabilityDensitiesTest
Visual C++
public ref class clsPermeabilityDensitiesTest

Inheritance Hierarchy
System.Object
  VB_ODOT_ACMIX.clsPermeabilityDensitiesTest

clsPermeabilityDensitiesTest Members

The clsPermeabilityDensitiesTest type exposes the following members.

Constructors

Name	Description
clsPermeabilityDensitiesTest	Creates a new instance of the clsPermeabilityDensitiesTest class

Methods

Name	Description
GetairWt	Get a value for airWt
GetidpermeabilityDensitiesTest	Get a value for idpermeabilityDensitiesTest
GetimmersedWt	Get a value for immersedWt
GetmaximumSpecificGravity	Get a value for maximumSpecificGravity
GetmixDesignTest_id	Get a value for mixDesignTest_id
GetssdWt	Get a value for ssdWt
SetairWt	Set the value of airWt
SetidpermeabilityDensitiesTest	Set the value of idpermeabilityDensitiesTest
SetimmersedWt	Set the value of immersedWt
SetmaximumSpecificGravity	Set the value of maximumSpecificGravity
SetmixDesignTest_id	Set the value of mixDesignTest_id
SetssdWt	Set the value of ssdWt

Fields

Name	Description
md_tblPermeabilityDensitiesTest	

clsPermeabilitySpecimentMeasurement Class

Contains properties and methods to retrieve as well as insert Permeability Speciment Measurements information into a datatable ready for database insert.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
public class clsPermeabilitySpecimentMeasurement
Visual Basic
Public Class clsPermeabilitySpecimentMeasurement
Visual C++
public ref class clsPermeabilitySpecimentMeasurement

Inheritance Hierarchy
System.Object
  VB_ODOT_ACMIX.clsPermeabilitySpecimentMeasurement

clsPermeabilitySpecimentMeasurement Members

The clsPermeabilitySpecimentMeasurement type exposes the following members.

Constructors

Name	Description
clsPermeabilitySpecimentMeasurement	Creates a new instance of the clsPermeabilitySpecimentMeasurement class

Methods

Name	Description
Getdiameter	Get a value for diameter
Getheight	Get a value for height
GetidPermeabilitySpecimentMeasurement	Get a value for idPermeabilitySpecimentMeasurement
Setdiameter	Set the value of diameter
Setheight	Set the value of height
SetidPermeabilitySpecimentMeasurement	Set the value of idPermeabilitySpecimentMeasurement

Fields

Name	Description
md_tblPermeabilitysPecimentMeasurement	

clsRiceTest Class

Contains properties and methods to retrieve as well as insert Rice test information into a datatable ready for database insert.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
public class clsRiceTest
Visual Basic
Public Class clsRiceTest
Visual C++
public ref class clsRiceTest

Inheritance Hierarchy
System.Object
  VB_ODOT_ACMIX.clsRiceTest

clsRiceTest Members

The clsRiceTest type exposes the following members.

Constructors

Name	Description
clsRiceTest	Creates a new instance of the clsRiceTest class

Methods

Name	Description
GetflaskNumber	Get a value for flaskNumber
GetflaskWaterSampleWt	Get a value for flaskWaterSampleWt
GetflaskWaterWt	Get a value for flaskWaterWt
GetidRiceTestSample	Get a value for idRiceTestSample
GetmixDesignTest_id	Get a value for mixDesignTest_id
GetsampleWt	Get a value for sampleWt
SetflaskNumber	Set the value of flaskNumber
SetflaskWaterSampleWt	Set the value of flaskWaterSampleWt
SetflaskWaterWt	Set the value of flaskWaterWt
SetidRiceTestSample	Set the value of idRiceTestSample
SetmixDesignTest_id	Set the value of mixDesignTest_id
SetsampleWt	Set the value of sampleWt

Fields

Name	Description
md_tblRiceTest	

clsRutTest Class

Contains properties and methods to retrieve as well as insert Rut test information into a datatable ready for database insert.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
public class clsRutTest
Visual Basic
Public Class clsRutTest
Visual C++
public ref class clsRutTest

Inheritance Hierarchy
System.Object
  VB_ODOT_ACMIX.clsRutTest

clsRutTest Members

The clsRutTest type exposes the following members.

Constructors

Name	Description
clsRutTest	Creates a new instance of the clsRutTest class

Methods

Name	Description
GetdryAirMass	Get a value for dryAirMass
GetdryMass	Get a value for dryMass
GetidRutsetSample	Get a value for idRutsetSample
GetinitialAirWt	Get a value for initialAirWt
GetinWaterMass	Get a value for inWaterMass
GetisSmallBag	Get a value for isSmallBag
GetmaximumSpecificGravity	Get a value for maximumSpecificGravity
GetmixDesignTest_id	Get a value for mixDesignTest_id
GetsealedAirMass	Get a value for sealedAirMass
GetsealedWaterMass	Get a value for sealedWaterMass
GetssdMass	Get a value for ssdMass
SetdryAirMass	Set the value of dryAirMass
SetdryMass	Set the value of dryMass
SetidRutsetSample	Set the value of idRutsetSample
SetinitialAirWt	Set the value of initialAirWt

Name	Description
SetinWaterMass	Set the value of inWaterMass
SetisSmallBag	Set the value of isSmallBag
SetmaximumSpecificGravity	Set the value of maximumSpecificGravity
SetmixDesignTest_id	Set the value of mixDesignTest_id
SetsealedAirMass	Set the value of sealedAirMass
SetsealedWaterMass	Set the value of sealedWaterMass
SetssdMass	Set the value of ssdMass

Fields

Name	Description
md_tblRutTest	

clsSandEquivalent Class

Contains properties and methods to retrieve as well as insert Sand Equivalent test information into a datatable ready for database insert.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
public class clsSandEquivalent
Visual Basic
Public Class clsSandEquivalent
Visual C++
public ref class clsSandEquivalent

Inheritance Hierarchy
System.Object
  VB_ODOT_ACMIX.clsSandEquivalent

clsSandEquivalent Members

The clsSandEquivalent type exposes the following members.

Constructors

Name	Description
clsSandEquivalent	Creates a new instance of the clsSandEquivalent class

Methods

Name	Description
GetclayReading	Get a value for clayReading
GetidSandEquivalentSample	Get a value for idSandEquivalentSample
GetmixDesignTest_id	Get a value for mixDesignTest_id
GetsandReading	Get a value for sandReading
GettinNumber	Get a value for tinNumber
SetclayReading	Set the value of clayReading
SetidSandEquivalentSample	Set the value of idSandEquivalentSample
SetmixDesignTest_id	Set the value of mixDesignTest_id
SetsandReading	Set the value of sandReading
SettinNumber	Set the value of tinNumber

Fields

Name	Description
md_tblSandEquivalent	

clsSSDTest Class

Contains properties and methods to retrieve as well as insert SSD Densities information into a datatable ready for database insert.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
public class clsSSDTest
Visual Basic
Public Class clsSSDTest

Visual C++
public ref class clsSSDTest

Inheritance Hierarchy
System.Object
  VB_ODOT_ACMIX.clsSSDTest

clsSSDTest Members

The clsSSDTest type exposes the following members.

Constructors

Name	Description
clsSSDTest	Creates a new instance of the clsSSDTest class

Methods

Name	Description
GetairWt	Get a value for airWt
GetasphaltBinderPt	Get a value for asphaltBinderPt
GetestimatedGmb	Get a value for estimatedGmb
GetestimatedGmbNini	Get a value for estimatedGmbNini
GetestimatedGmbNmax	Get a value for estimatedGmbNmax
GethtNdes	Get a value for htNdes
GethtNini	Get a value for htNini
GetidSsdSample	Get a value for idSsdSample
GetmixDesignTest_id	Get a value for mixDesignTest_id
GetnMaxAirWt	Get a value for nMaxAirWt
GetnMaxSsdWt	Get a value for nMaxSsdWt
GetnMaxWaterWt	Get a value for nMaxWaterWt
GetssdWt	Get a value for ssdWt
GetWaterWt	Get a value for WaterWt

Name	Description
SetairWt	Set the value of airWt
SetasphaltBinderPt	Set the value of asphaltBinderPt
SetestimatedGmb	Set the value of estimatedGmb
SetestimatedGmbNini	Set the value of estimatedGmbNini
SetestimatedGmbNmax	Set the value of estimatedGmbNmax
SethtNdes	Set the value of htNdes
SethtNini	Set the value of htNini
SetidSsdSample	Set the value of idSsdSample
SetmixDesignTest_id	Set the value of mixDesignTest_id
SetnMaxAirWt	Set the value of nMaxAirWt
SetnMaxSsdWt	Set the value of nMaxSsdWt
SetnMaxWaterWt	Set the value of nMaxWaterWt
SetssdWt	Set the value of ssdWt
SetWaterWt	Set the value of WaterWt

Fields

Name	Description
md_tblSSDTest	

clsT283Test Class

Contains properties and methods to retrieve as well as insert T283 Test information into a datatable ready for database insert.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
public class clsT283Test
Visual Basic
Public Class clsT283Test
Visual C++
public ref class clsT283Test

Inheritance Hierarchy
System.Object
  VB_ODOT_ACMIX.clsT283Test

clsT283Test Members

The clsT283Test type exposes the following members.

Constructors

Name	Description
clsT283Test	Creates a new instance of the clsT283Test class

Methods

Name	Description
GetdryMass	Get a value for dryMass
GetidT283testSample	Get a value for idT283testSample
GetinWaterMass	Get a value for inWaterMass
GetisBrokenAggregate	Get a value for isBrokenAggregate
GetisControled	Get a value for isControled
Getload	Get a value for load
GetmaximumSpecificGravity	Get a value for maximumSpecificGravity
GetmixDesignTest_id	Get a value for mixDesignTest_id
GetsaturatedMass	Get a value for saturatedMass
GetssdMass	Get a value for ssdMass
GetvisualMoistureDamage	Get a value for visualMoistureDamage
SetdryMass	Set the value of dryMass
SetidT283testSample	Set the value of idT283testSample
SetinWaterMass	Set the value of inWaterMass
SetisBrokenAggregate	Set the value of isBrokenAggregate

Name	Description
SetisControled	Set the value of isControled
Setload	Set the value of load
SetmaximumSpecificGravity	Set the value of maximumSpecificGravity
SetmixDesignTest_id	Set the value of mixDesignTest_id
SetsaturatedMass	Set the value of saturatedMass
SetssdMass	Set the value of ssdMass
SetvisualMoistureDamage	Set the value of visualMoistureDamage

Fields

Name	Description
md_tblT283Test	

clsTemperatures Class

Contains properties and methods to retrieve as well as insert mix temperatures information into a datatable ready for database insert.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
public class clsTemperatures
Visual Basic
Public Class clsTemperatures
Visual C++
public ref class clsTemperatures

Inheritance Hierarchy
System.Object
  VB_ODOT_ACMIX.clsTemperatures

clsTemperatures Members

The clsTemperatures type exposes the following members.

Constructors

Name	Description
clsTemperatures	Creates a new instance of the clsTemperatures class

Methods

Name	Description
GetdischargedTemp	Get a value for dischargedTemp
GetidMixtemperature	Get a value for idMixtemperature
GetlabCompactionTemp	Get a value for labCompactionTemp
GetlabMixingTemp	Get a value for labMixingTemp
GetmixDesign_id	Get a value for mixDesign_id
GetoptimumCompactionTemp	Get a value for optimumCompactionTemp
SetdischargedTemp	Set the value of dischargedTemp
SetidMixtemperature	Set the value of idMixtemperature
SetlabCompactionTemp	Set the value of labCompactionTemp
SetlabMixingTemp	Set the value of labMixingTemp
SetmixDesign_id	Set the value of mixDesign_id
SetoptimumCompactionTemp	Set the value of optimumCompactionTemp

Fields

Name	Description
md_tblTemperatures	

frmACMIX_Login Class

The main window form that gives access to the ACMIX software.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
```
public class frmACMIX_Login : Form
```
Visual Basic
```
Public Class frmACMIX_Login _
        Inherits Form
```
Visual C++
```
public ref class frmACMIX_Login : public Form
```

Inheritance Hierarchy
```
System.Object
  System.MarshalByRefObject
    System.ComponentModel.Component
      System.Windows.Forms.Control
        System.Windows.Forms.ScrollableControl
          System.Windows.Forms.ContainerControl
            System.Windows.Forms.Form
              VB_ODOT_ACMIX.frmACMIX_Login
```

frmACMIX_Login Members

The frmACMIX_Login type exposes the following members.

Constructors

Name	Description
frmACMIX_Login	
frmACMIX_Login	Initializes a new instance of the frmACMIX_Login class

Methods

Name	Description
__ENCAddToList	
ACMIX_Login_Load	Load the frmACMIX_Login windows form and populate its controls with the appropriate data
btnCancel_Click	Close application
btnEnter_Click	Perform a Login operation
InitializeComponent	
txtPassword_Enter	Select all the text in the password textbox
txtPassword_KeyDown	Detect a Enter or Escape key down inside the password textbox

Name	Description
txtUserID_Enter	Select all the text in the user ID textbox
txtUserID_KeyDown	Detect a Enter or Escape key down inside the user ID textbox

Fields

Name	Description
__ENCList	
_btnCancel	
_btnEnter	
_grpLogin	
_lblPassword	
_lblStatus	
_lblUserID	
_PictureBox1	
_rbLocal	
_rbRemote	
_txtPassword	
_txtUserID	
_txtWelcome	
components	
fullName	
password	
userID	

frmACMIX_Main Class

Contains the code for the ACMIX_Main window form which is the first screen that the user have access to after a successful login. ACMIX_Main shows the user lists of existing mixes and give the option to create new mix designs or modify existing ones.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
public class frmACMIX_Main : Form
Visual Basic
Public Class frmACMIX_Main _
    Inherits Form
Visual C++
public ref class frmACMIX_Main : public Form

Inheritance Hierarchy
System.Object
  System.MarshalByRefObject
    System.ComponentModel.Component
      System.Windows.Forms.Control
        System.Windows.Forms.ScrollableControl
          System.Windows.Forms.ContainerControl
            System.Windows.Forms.Form
              VB_ODOT_ACMIX.frmACMIX_Main

frmACMIX_Main Members

The frmACMIX_Main type exposes the following members.

Constructors

Name	Description
frmACMIX_Main	
frmACMIX_Main	Initializes a new instance of the frmACMIX_Main class

Methods

Name	Description
__ENCAddToList	
ACMIX_Main_FormClosed	ACMIX_Main_FormClosed is automaticaly called when an application closing event took place all resources for frmACMIX_Process and frmACMIX_Login are dsiposed
ACMIX_Main_Load	Load the frmACMIX_Main windows form and populate its controls with the appropriate data

Name	Description
btnCreate_Click	btnCreate_Click initiate a new instant of the frmACMIX_Process windows form to create a new mix design
btnModify_Click	When this button is clicked by the user a frmACMIX_Process windows form and loaded with data from the slected mix design to be modified
InitializeComponent	

Fields

Name	Description
__ENCList	
_btnCreate	
_btnModify	
_btnOtherTemplate	
_btnUserTemplate	
_dgvOtherMixes	
_dgvUserMixes	
_lblOtherMixes	
_lblUserMixes	
_SplitContainer1	
components	
md_idMixDesign	

frmACMIX_Process Class

Contains the code for the ACMIX_Process windows form which is the main container of the ACMIX user interface.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
```
public class frmACMIX_Process : Form
```
Visual Basic
```
Public Class frmACMIX_Process _
        Inherits Form
```
Visual C++
```
public ref class frmACMIX_Process : public Form
```

Inheritance Hierarchy
System.Object
  System.MarshalByRefObject
    System.ComponentModel.Component
      System.Windows.Forms.Control
        System.Windows.Forms.ScrollableControl
          System.Windows.Forms.ContainerControl
            System.Windows.Forms.Form
              VB_ODOT_ACMIX.frmACMIX_Process

frmACMIX_Process Members

The frmACMIX_Process type exposes the following members.

Constructors

Name	Description
frmACMIX_Process	
frmACMIX_Process	Initializes a new instance of the frmACMIX_Process class

Methods

Name	Description
__ENCAddToList	
ACMIX_Process_FormClosed	Dispose resources when the application is closed
ACMIX_Process_Load	Load the frmACMIX_Process windows form and populate its controls with the appropriate data
advancedsplit	split a string and wrap it while making sure it fits in column
btnCorelok_Click	Open or display the Corelok Tab
btnFAA_Click	Open or display the FAA test Tab

Name	Description
btnGradation_Click	Open or display the Gradation Tab
btnGsb_Click	Open or display the Gsb test Tab
btnHamburg_Click	Open or display the Hamburg test Tab
btnInfo_Click	Open or display the Info Tab
btnIniBatching_Click	Open or display the Batching Tab
btnIOC_Click	Open or display the IOC test Tab
btnNext_Click	Move to the next tab
btnPermeability_Click	Open or display the Permeability Tab
btnPrevious_Click	Move to previous tab
btnPrint_Click	Call the printing form to print mix design tabs
btnRiceTest_Click	Open or display the Rice test Tab
btnSandEquivalent_Click	Open or display the Sand Equivalent test Tab
btnSave_Click	Save changes to the database over the internet
btnSSDTest_Click	Open or display the SSD test Tab
btnSubmit_Click	Create a mix design preview form for submission
btnT283_Click	Open or display the T-283 test Tab
btnTemperatures_Click	Open or display the Temperatures Tab
Ceiling	Calculate ceiling of a decimal number
EnableButtons	Enable / Disable buttons based on the mix design status and current active tab
fillmCell	Create a horizontally merged cell
InitializeComponent	
Progress	Update the ACMIX application progress bar
sizeDGV	Dynamicaly resize DataGridView controls based on their content

Fields

Name	Description
__ENCList	
_btnBatching	
_btnCorelok	
_btnFAA	
_btnGradation	
_btnGSBTest	
_btnHamburg	
_btnInfo	
_btnIOC	
_btnNext	
_btnPermeability	
_btnPrevious	
_btnRiceTest	
_btnSandEquivalent	
_btnSave	

Name	Description
_btnSSDTest	
_btnSubmit	
_btnT283	
_btnTemperatures	
_prgProcess	
_tlpNavigationButtons	
AggProducer	
AggProducerCode	
AggType	
BatchingForm	
btnList	
btns	
bufferCoreLok	
bufferGSBTest	
bufferIOCTest	
bufferMixAgg	
bufferMixAggGrad	
bufferMixBatch	
bufferMixBatchingSandEq	
bufferMixDesign	
bufferPermeability	
bufferPermeabilityDensitiesTest	
bufferPermeabilitySpecimentMeasurement	
bufferRiceTest	
bufferSandEquivalent	
bufferSSdTest	
bufferT283Test	
bufferTemperatures	
components	
CorelokForm	
DP	
FAAForm	
fontTables11	
fontTables11Bold	
fontTables9	
FormNames	
Gmm	
GradationForm	
GSBTestForm	
HamburgForm	

Name	Description
InfoForm	
IOCForm	
md_AsphaltCement_fullName	
md_BatchingInsolubleResidueWt	
md_durabilityIndex	
md_flatElong	
md_fracturedFaces1MorePt	
md_fracturedFaces2MorePt	
md_Gsb	
md_Gse	
md_IOC	
md_ITS	
md_laAbrasion	
md_microDeval	
md_P0075	
md_Permeablity	
md_PtPass8Comb	
md_RiceAcPt	
md_SandEquivalent	
md_TSR	
mdcountyName	
mdfedProjectNumber	
mdMaterial_fullName	
mdmixClassDesc	
mdmixDesignTypeDesc	
mdplantName	
mdprimaryProjectNumber	
mdproducerSupplierName	
mdrouteNumber	
NextFormName	
PermeabilityForm	
PrevFormName	
RiceTestForm	
SandEquivalentForm	
SSDTestForm	
strFormat	
T283Form	
tblAggProducer	
tblAggregateDesignProperties	
tblAggType	

Name	Description
tblDisplayAC	
tblDisplayBatchingWtCalc	
tblDisplayGradation	
tblDisplaySandEquivalent	
tblSieveSize	
TemperaturesForm	
TestTableForm	

frmACMIX_Submit Class

Contains the code for the frmACMIX_Submit windows that will generate a preview of the final mix design which is ready for submission

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
```
public class frmACMIX_Submit : Form
```
Visual Basic
```
Public Class frmACMIX_Submit _
        Inherits Form
```
Visual C++
```
public ref class frmACMIX_Submit : public Form
```

Inheritance Hierarchy
System.Object
  System.MarshalByRefObject
    System.ComponentModel.Component
      System.Windows.Forms.Control
        System.Windows.Forms.ScrollableControl
          System.Windows.Forms.ContainerControl
            System.Windows.Forms.Form
              VB_ODOT_ACMIX.frmACMIX_Submit

frmACMIX_Submit Members

The frmACMIX_Submit type exposes the following members.

Constructors

Name	Description
frmACMIX_Submit	
frmACMIX_Submit	Initializes a new instance of the frmACMIX_Submit class

Methods

Name	Description
__ENCAddToList	
dgvAggregateGradations_DataError	Detect data type errors in the aggregate gradation DataGridView and act accordingly
dgvAggregateGradations1_CellPainting	Override the cell painting method of the dgvAggregateGradations1 control for vertical text format in the headers
dgvAggregateGradations2_CellFormatting	Override the cell formatting method of the

Name	Description
	dgvAggregateGradations2 control for appropriate decimal number rounding
dgvDensities_CellFormatting	Override the cell formatting method of the dgvDensities control for setting appropriate column width
dgvDensities_CellPainting	Override the cell painting method of the dgvDensities control for vertical cell merge
dgvDust_CellPainting	Override the cell painting method of the dgvDust control for vertical cell merge
dgvJMF_CellPainting	Override the cell painting method of the dgvJMF control for vertical text format in the headers
dgvMixTemperature_CellPainting	Override the cell painting method of the dgvMixTemperature control for vertical cell merge
frmACMIX_Submit_Load	Load the frmACMIX_Submit windows form and populate its controls with the appropriate data
InitializeComponent	
populate_dgvAggregatesTests	Populate the tests on aggregates box with data from different test tabs and corresponding requirements from the database
populate_dgvAsphaltCementTest	Populate the tests on asphalt cement box
populate_dgvCompressedMixTests	Populate the tests on compressed mixtures box with required limits from the database
populate_dgvDensities	Populate the densities box with data from the SSD tab and corresponding requirements from the database
populate_dgvDust	Populate the dust properties box from the SSd tab and corresponding requirements from the datatbase
populate_dgvJMF	Populate the aggregate gradation limits and requirements that are retrieved from the database
populate_dgvMixTemperature	Populate mixing and compaction temperatures that were entered by the user or automatically selected based on the mix type on the Temperatures tab
populate_grpStrength	Populate the strength information from the T-283 tab and corresponding requirements from the database
populateAggGrdation	Populate gradation information that were entered in the Gradation tab
populatecmbAdditive	Retrieve data from the database and populate the cmbAdditive ComboBox
populateMixInformation	Populate basic mix information that was entered in the Info tab
txtCombPtAC_TextChanged	Detect a text change in the percent asphalt content textbox and act accordingly

Fields

Name	Description
__ENCList	
_btnSave	

Name	Description
_btnSubmit	
_cmbAdditive	
_dgvAggregateGradations1	
_dgvAggregateGradations2	
_dgvAggregatesTests	
_dgvAsphaltCementTests	
_dgvCompressedMixTests	
_dgvDensities	
_dgvDust	
_dgvJMF	
_dgvMixTemperature	
_grpAggregatesInfo	
_grpMixInfo	
_grpStrength	
_Label1	
_Label10	
_Label11	
_Label12	
_Label13	
_Label14	
_Label15	
_Label16	
_Label17	
_Label2	
_Label20	
_Label23	
_Label24	
_Label25	
_Label26	
_Label3	
_Label4	
_Label5	
_Label6	
_Label7	
_Label8	
_Label9	
_lblComments	
_lblITSreq	
_lblPermeabilityTitle	
_lblSpecs	

Name	Description
_lblTSRreq	
_tbAggregates	
_tbcRequirements	
_tbTests	
_txtAsphaltContent	
_txtCombPtAC	
_txtComments	
_txtcountyName	
_txtDesignType	
_txtFedProjectNumber	
_txtFiber	
_txtidContract	
_txtITS	
_txtMixID	
_txtMixPlant	
_txtMixProducer	
_txtMixType	
_txtPrimaryProjectNumber	
_txtPtAC	
_txtrouteNumber	
_txtThick	
_txtTSR	
components	
mCell_header1	
mCell_header2	
mCell_header3	
tblAggGradationSubmit	
tblAntistripnAdditive	
tblJMF	

frmAggInput Class

A popup window that allow the user to enter aggregate gradation weights/percents, source, and supplier.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
```
public class frmAggInput : Form
```
Visual Basic
```
Public Class frmAggInput _
        Inherits Form
```
Visual C++
```
public ref class frmAggInput : public Form
```

Inheritance Hierarchy
System.Object
  System.MarshalByRefObject
    System.ComponentModel.Component
      System.Windows.Forms.Control
        System.Windows.Forms.ScrollableControl
          System.Windows.Forms.ContainerControl
            System.Windows.Forms.Form
              VB_ODOT_ACMIX.frmAggInput

frmAggInput Members

The frmAggInput type exposes the following members.

Constructors

Name	Description
frmAggInput	
frmAggInput	Initializes a new instance of the frmAggInput class

Methods

Name	Description
__ENCAddToList	
ACMIX_AggInput_FormClosed	Dispose resources upon form close operation
ACMIX_AggInput_FormClosing	If all the values are within the limits and with the correct format, and the aggregate and producer are selected, close for and DialogResult.OK argument
AggInput_Load	Load the frmAggInput windows form and populate its controls with the appropriate data

Name	Description
AreAggandProducerValid	Make sure the aggregate producer is selected
btnCancel_Click	Cancel an aggregate gradation add or edit operation
btnInsert_Click	Insert modified gradation data into the table after an add or edit operation
cmbAggType_SelectedIndexChanged	Check if the selected aggregate type is unlisted. if true, select "Contractor" as the producer
dgvAggInput_CellEndEdit	Perform calculations and formating in the dgvAggInput DataGridView once a cell value is changed
dgvAggInput_CellValueChanged	Perform the correct rounding once a cell value is changed
dgvAggInput_DataError	Detect data type errors in the aggregate gradation input DataGridView and act accordingly
ImportDataForEdit	Retieve gradation data for an edit call
InitializeComponent	
IsDryWeightValid	Make sure a dry weight value is entered
IsPercentWithinLimit	Make sure that the gradation percentage is within the limits
populate_cmbAggProducer	Retrieve data from the database and populate the cmbAggProducer ComboBox
populate_cmbAggType	Retrieve data from the database and populate the cmbAggType ComboBox
populate_dgvAggInput	Retrieve data from the database and setup the dgvAggInput DataGridView

Fields

Name	Description
__ENCList	
_btnCancel	
_btnInsert	
_cmbAggProducer	
_cmbAggType	
_dgvAggInput	
_Label1	
_Label2	
_lblAggProducer	
_lblSelectAgg	
_lblSelectProducer	
_txtAggProducer	
aggID	
aggIndex	
components	
DatabaseError	
loaded	

Name	Description
tblAggregateInput	

frmBatching_3 Class

Contains the code for the frmBatching windows form which takes care of the aggregate batching calculations.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
```
public class frmBatching_3 : Form
```
Visual Basic
```
Public Class frmBatching_3 _
        Inherits Form
```
Visual C++
```
public ref class frmBatching_3 : public Form
```

Inheritance Hierarchy
```
System.Object
  System.MarshalByRefObject
    System.ComponentModel.Component
      System.Windows.Forms.Control
        System.Windows.Forms.ScrollableControl
          System.Windows.Forms.ContainerControl
            System.Windows.Forms.Form
              VB_ODOT_ACMIX.frmBatching_3
```

frmBatching_3 Members

The frmBatching_3 type exposes the following members.

Constructors

Name	Description
frmBatching_3	
frmBatching_3	Initializes a new instance of the frmBatching_3 class

Methods

Name	Description
__ENCAddToList	
ACMIX_Process_BatchingINI_Load	Load the frmBatching_3 windows form and populate its controls with the appropriate data

Name	Description
AggInsolubleResidueWtChanged	Update calculations once the insoluble residue value of an aggregate is changed
AggPtUsedChanged	Update the batching calculations once the percentage used value of an aggregate is changed
BatchingWeightCellsPainting	Update calculations only when the dgvWtCalculations is visible
CalBatchingWT	Perform batching calculations
CalBatchingWTLastCol	Calculate the batching weights column
CalcACWt	Calculate the asphalt content weights
CalcCombAggPt	Perform batching combination percentage calculations
calculatePtLossAndWaterWt	Calculate the loss percent and water weight
cmbFiber_SelectedIndexChanged	Detect a change in the selected value of percent fiber
cmbSelectAsphaltCement_SelectedIndexChanged	Detect a change in the selected value of the asphalt cement
dgvACperWt_CellFormatting	Override the cell formatting method of the dgvACperWt control for appropriate decimal number rounding
dgvACperWt_CellValueChanged	Perform the appropriate calculation upon a cell value change in dgvACperWt
dgvACperWt_DataError	Detect data type errors in dgvACperWt DataGridView and act accordingly
dgvBatchingGradation_CellFormatting	Override the cell formatting method of the dgvBatchingGradation control for appropriate decimal number rounding and color coding
dgvBatchingGradation_CellPainting	Override the cell painting method of the dgvJMF control for vertical text format in the headers
dgvBatchingGradation_CellValueChanged	Perform the appropriate calculation upon a cell value change in dgvBatchingGradation
dgvBatchingWtCalc_CellFormatting	Override the cell formatting method of the dgvBatchingWtCalc control for appropriate decimal number rounding
dgvBatchingWtCalc_CellValueChanged	Perform the appropriate calculation upon a cell value change in dgvBatchingWtCalc
dgvBatchingWtCalc_DataError	Detect data type errors in dgvBatchingWtCalc DataGridView and act accordingly
dgvConSrcProp1_CellPainting	Override the cell painting method of the dgvConSrcProp1 control for vertical text format in the headers
dgvConSrcProp2_CellValueChanged	Perform the appropriate calculation upon a cell value change in dgvConSrcProp2
dgvConSrcProp2_DataError	Detect data type errors in dgvConSrcProp2 DataGridView and act accordingly
dgvGilsonWt_CellPainting	Override the cell painting method of the dgvJMF control for vertical text format in the headers

Name	Description
dgvWtCalculations_VisibleChanged	Detect if dgvWtCalculations is visible
ImportCombAgg	Import batching combination percentage for batching calculations
InitializeComponent	
populate_dgvACperWt	Populate dgvACperWt DataGridView with the appropriate data from the database
populate_dgvBatchingGradation	Populate dgvBatchingGradation DataGridView with the appropriate data from the database
populate_dgvBatchingWtCalc_Opt1	Populate dgvBatchingWtCalc DataGridView with the appropriate data from the database for batching option 1 calculations
populate_dgvBatchingWtCalc_Opt2	Populate dgvBatchingWtCalc DataGridView with the appropriate data from the database for batching option 2 calculations
populate_dgvConSrcProp	Populate dgvConSrcProp DataGridView with the appropriate data from the database
populate_dgvConSrcPropRequirements	Populate dgvConSrcPropRequirements DataGridView with the appropriate data from the database
populate_dgvGilsonWt_Opt1	Populate dgvGilsonWt DataGridView with the appropriate data from the database for batching option 1 calculations
populate_dgvGilsonWt_Opt2	Populate dgvGilsonWt DataGridView with the appropriate data from the database for batching option 2 calculations
populate_dgvSandEquivalent	Populate dgvSandEquivalent DataGridView with the appropriate data from the database
populate_dgvTolerence	Populate tblTolerance DataGridView with the appropriate data from the database
populateBatchingOption	Modify the appropriate controls based on the selected batching option
populateCmbSelectAsphaltCement	Retrieve data from the database and populate the cmbSelectAsphaltCement ComboBox
tbUsed1_Scroll	Percent used is changed for aggregate 1
tbUsed2_Scroll_1	Percent used is changed for aggregate 2
tbUsed3_Scroll_1	Percent used is changed for aggregate 3
tbUsed4_Scroll_1	Percent used is changed for aggregate 4
tbUsed5_Scroll	Percent used is changed for aggregate 5
tbUsed6_Scroll	Percent used is changed for aggregate 6
txtAggWt_TextChanged	Detect a change in the aggregate weight and update calculations
txtBatWt_TextChanged	Detect a change in the batching weight and update calculations
txtInsolRes_TextChanged_1	Detect insoluble residue value changed and perform the appropriate calculations
txtPercentUsed1_TextChanged	Percent used is changed for aggregate 1

Name	Description
txtPercentUsed2_TextChanged	Percent used is changed for aggregate 2
txtPercentUsed3_TextChanged	Percent used is changed for aggregate 3
txtPercentUsed4_TextChanged	Percent used is changed for aggregate 4
txtPercentUsed5_TextChanged	Percent used is changed for aggregate 5
txtPercentUsed6_TextChanged	Percent used is changed for aggregate 6
txtRAP_TextChanged	Detect RAP value changed and perform the appropriate calculations
txtSpecimen_TextChanged	Detect a change in the specimen weight and update calculations
UpdateSandEquivalentTBL	Perform sand equivalent calculations for the batching tab

Fields

Name	Description
__ENCList	
_cmbFiberPt	
_cmbSelectAsphaltCement	
_DataGridView2	
_DataGridView3	
_DataGridView4	
_dgvACperWt	
_dgvBatchingGradation	
_dgvBatchingWtCalc	
_dgvConSrcProp1	
_dgvConSrcProp2	
_dgvConSrcPropRequirements	
_dgvGilsonWt	
_dgvSandEquivalent	
_dgvTolerence	
_grpAsphaltContent	
_Label1	
_Label10	
_Label11	
_Label12	
_Label13	
_Label14	
_Label15	
_Label16	
_Label17	
_Label2	
_Label3	

Name	Description
_Label4	
_Label5	
_Label6	
_Label7	
_Label8	
_Label9	
_lblAccumWt	
_lblAdjustedWt	
_lblAsphaltContentDesc	
_lblFiberPt	
_lblFineWt	
_lblPtLoss	
_lblSelectAsphaltCement	
_lblTargetPtAC	
_lblWaterWt	
_PictureBox1	
_TableLayoutPanel2	
_TableLayoutPanel3	
_tbcBatching	
_tbpBatchingCmbAgg	
_tbpBatchingIni	
_tbpBatchingRS	
_tbpConSrcProp	
_tbUsed1	
_tbUsed2	
_tbUsed3	
_tbUsed4	
_tbUsed5	
_tbUsed6	
_TextBox1	
_TextBox2	
_TextBox3	
_TextBox4	
_TextBox5	
_TextBox6	
_TextBox7	
_TextBox8	
_TextBox9	
_tlpBatchingGradation	
_tlpPtUsed	

Name	Description
_txtAccumWt	
_txtAdjustedWt	
_txtAgg1_2	
_txtAgg2_2	
_txtAgg3_2	
_txtAgg4_2	
_txtAgg5_2	
_txtAgg6_2	
_txtAggWt	
_txtBatWt	
_txtFineWt	
_txtInsolRes1	
_txtInsolRes2	
_txtInsolRes3	
_txtInsolRes4	
_txtInsolRes5	
_txtInsolRes6	
_txtPercentUsed1	
_txtPercentUsed2	
_txtPercentUsed3	
_txtPercentUsed4	
_txtPercentUsed5	
_txtPercentUsed6	
_txtPtLoss	
_txtRAP1	
_txtRAP2	
_txtRAP3	
_txtRAP4	
_txtRAP5	
_txtRAP6	
_txtSpecimen	
_txtTargetPtAC	
_txtTolerance	
_txtWaterWt	
components	
loaded	
RAP	
tblAsphaltCement	
tblTolerance	
tbUsedList	

Name	Description
txtAggList	
txtInsolList	
txtRAPList	
txtUsedList	

frmCorelok_7 Class

Contains the code for the frmCorelok_7 windows form which takes care of the Corelok densities calculations.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
```
public class frmCorelok_7 : Form
```
Visual Basic
```
Public Class frmCorelok_7 _
        Inherits Form
```
Visual C++
```
public ref class frmCorelok_7 : public Form
```

Inheritance Hierarchy
```
System.Object
  System.MarshalByRefObject
    System.ComponentModel.Component
      System.Windows.Forms.Control
        System.Windows.Forms.ScrollableControl
          System.Windows.Forms.ContainerControl
            System.Windows.Forms.Form
              VB_ODOT_ACMIX.frmCorelok_7
```

frmCorelok_7 Members

The frmCorelok_7 type exposes the following members.

Constructors

Name	Description
frmCorelok_7	
frmCorelok_7	Initializes a new instance of the frmCorelok_7 class

Methods

Name	Description
__ENCAddToList	
calculateAvgGmbCorelok	Execute or update controls and fields with the appropriate calculations. Calculate Average Gmb
calculateCorelok	Execute or update controls and fields with the appropriate calculations
calculateCVCorelok	Execute or update controls and fields with the appropriate calculations. Calculate Bag Volume Correction L: ROUND(0.8596-((0.00166*A)/(B-E)),3), S: ROUND(0.8121-((0.000566*A)/(B-E)),3),""))
calculateGmbCorelok	Execute or update controls and fields with the appropriate calculations. Calculate Gmb Gmb = ROUND(A/((B-C)-((B-E)/CV)),3),"")
calculateGmmCorelok	Execute or update controls and fields with the appropriate calculations. Calculate Gmm ROUND(100/(((100-(Pb+Pcf))/Gse)+(Pb/Gb)+(Pcf/GmmPcf)),3) ROUND(100/(((100-Pb)/Gse)+(Pb/Gb)),3)
calculatePtAirVoidsCorelok	Execute or update controls and fields with the appropriate calculations. Calculate Percent Air Voids % Pa = 100 - % Density
calculatePtDensityCorelok	Execute or update controls and fields with the appropriate calculations. Calculate Percent Density % Density = 100 * Gmb / Gmm
calculatePtDensityCorelok2	Execute or update controls and fields with the appropriate calculations. Calculate Percent Density % Density = 100 * Gmb / Gmm
calculatePtVMACorelok	Execute or update controls and fields with the appropriate calculations. Calculate Percent VMA % VMA = ROUND(100-((AvrGmb/Gsb)*(100-(Pb+Pf)))
calculatePtVMACorelok2	Execute or update controls and fields with the appropriate calculations. Calculate Percent VMA % VMA = ROUND(100-((AvrGmb/Gsb)*(100-(Pb+Pf)))
dgvCorelok1_CellValueChanged	Perform the appropriate calculation upon a cell value change in dgvCorelok1
dgvCorelok1_DataError	Detect data type errors in the dgvCorelok1 DataGridView and act accordingly
dgvCorelok2_CellContentClick	Perform the right calculations upon a cell content click event
dgvCorelok2_DataError	Detect data type errors in the dgvCorelok2 DataGridView and act accordingly
frmCorelok_Load	Load the frmCorelok_7 windows form and populate its controls with the appropriate data
InitializeComponent	
populateCmbCertifiedTechnician	Retrieve data from the database and populate the CmbCertifiedTechnician ComboBox

Name	Description
populatePb	Populate the control with the appropriate data and format
populatePf	Populate controls and fields with the appropriate data and format
populateTable	Populate controls and fields with the appropriate data and format
rbAutomatic_CheckedChanged	Detect a radio button change in rbAutomatic and Set the appropriate format
rbUser_CheckedChanged	Detect a radio button change in rbUser and Set the appropriate format
txtGb_TextChanged	Detect a textbox value change and perform the appropriate actions
txtGse_TextChanged	Detect a textbox value change and perform the appropriate actions

Fields

Name	Description
__ENCList	
_cmbCertifiedTechnician	
_DateTimePicker1	
_dgvCorelok1	
_dgvCorelok2	
_grpCorelok	
_grpEstimatedOption	
_Label1	
_Label2	
_Label3	
_Label4	
_lblCorelokCode	
_lblCorelokTitle	
_lblSelectCertifiedTechnician	
_lblSelectTestDate	
_rbAutomatic	
_rbUser	
_TableLayoutPanel1	
_txtGb	
_txtGsb	
_txtGse	
_txtP0075	
components	
mCell_HighPt_AgvGmb	

Name	Description
mCell_HighPt_Density	
mCell_HighPt_Gmm	
mCell_HighPt_Pb	
mCell_HighPt_Pf	
mCell_HighPt_VMA	
mCell_LowPt_AgvGmb	
mCell_LowPt_Density	
mCell_LowPt_Gmm	
mCell_LowPt_Pb	
mCell_LowPt_Pf	
mCell_LowPt_VMA	
mCell_TargetPt_AgvGmb	
mCell_TargetPt_Density	
mCell_TargetPt_Gmm	
mCell_TargetPt_Pb	
mCell_TargetPt_Pf	
mCell_TargetPt_VMA	
tblCertifiedTechnician	

frmFAA_10 Class

Contains the code for the frmFAA_10 windows which takes care of the FAA test calculations.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
```
public class frmFAA_10 : Form
```
Visual Basic
```
Public Class frmFAA_10 _
        Inherits Form
```
Visual C++
```
public ref class frmFAA_10 : public Form
```

Inheritance Hierarchy
System.Object
  System.MarshalByRefObject
    System.ComponentModel.Component
      System.Windows.Forms.Control
        System.Windows.Forms.ScrollableControl
          System.Windows.Forms.ContainerControl
            System.Windows.Forms.Form
              VB_ODOT_ACMIX.frmFAA_10

frmFAA_10 Members

The frmFAA_10 type exposes the following members.

Constructors

Name	Description
frmFAA_10	
frmFAA_10	Initializes a new instance of the frmFAA_10 class

Methods

Name	Description
__ENCAddToList	
calculateVoids	Execute or update controls and fields with the appropriate calculations. Calculate Uncompacted Voids
dgvFAA_CellFormatting	Override the cell formatting method of the dgvAggregateGradations2 control for appropriate decimal number rounding
dgvFAA_CellPainting	Override the cell painting method of the dgvDust

Name	Description
	control for vertical cell merge
frmFAA_Load	Load the frmFAA_10 windows form and populate its controls with the appropriate data
InitializeComponent	
populate_dgvFAA	Populate DataGridView with the appropriate data from the database
populateCmbCertifiedTechnician	Retrieve data from the database and populate the ComboBox
txtCylFinesMass1_TextChanged	Detect a textbox value change and perform the appropriate actions
txtCylFinesMass2_TextChanged	Detect a textbox value change and perform the appropriate actions
txtCylVol1_TextChanged	Detect a textbox value change and perform the appropriate actions
txtCylVol2_TextChanged	Detect a textbox value change and perform the appropriate actions

Fields

Name	Description
__ENCList	
_cmbCertifiedTechnician	
_DateTimePicker1	
_dgvFAA	
_grpFAA1	
_grpFAA2	
_Label1	
_Label5	
_Label6	
_Label7	
_Label9	
_lblFAACode	
_lblFAATitle	
_lblSample1	
_lblSample2	
_lblSelectCertifiedTechnician	
_lblSelectTestDate	
_TableLayoutPanel1	
_txtAvgUncompactedVoid	
_txtCylFinesMass1	
_txtCylFinesMass2	
_txtCylVol1	

Name	Description
_txtCylVol2	
_txtGmbFine1	
_txtGmbFine2	
_txtUncompactedVoid1	
_txtUncompactedVoid2	
bufferFAATest	
components	
loaded	
tblCertifiedTechnician	
tblFAASieve	
tblFAASieveDisplay	

frmGradation_2 Class

Contains the code for the frmGradation windows which takes care of the aggregate gradation calculations.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
```
public class frmGradation_2 : Form
```
Visual Basic
```
Public Class frmGradation_2 _
        Inherits Form
```
Visual C++
```
public ref class frmGradation_2 : public Form
```

Inheritance Hierarchy
System.Object
  System.MarshalByRefObject
    System.ComponentModel.Component
      System.Windows.Forms.Control
        System.Windows.Forms.ScrollableControl
          System.Windows.Forms.ContainerControl
            System.Windows.Forms.Form
              VB_ODOT_ACMIX.frmGradation_2

frmGradation_2 Members

The frmGradation_2 type exposes the following members.

Constructors

Name	Description
frmGradation_2	
frmGradation_2	Initializes a new instance of the frmGradation_2 class

Methods

Name	Description
__ENCAddToList	
ACMIX_Process_Gradation_Load	Load the frmGradation_2 windows form and populate its controls with the appropriate data
AddAggGradation	Call the frmAggInput to add or edit an aggregate gradation set
btnAddAggregate1_Click	Perform an aggregate gradation add or edit operation

Name	Description
btnAddAggregate2_Click	Perform an aggregate gradation add or edit operation
btnAddAggregate3_Click	Perform an aggregate gradation add or edit operation
btnAddAggregate4_Click	Perform an aggregate gradation add or edit operation
btnAddAggregate5_Click	Perform an aggregate gradation add or edit operation
btnAddAggregate6_Click	Perform an aggregate gradation add or edit operation
cmbGradationEffectiveDate_SelectedIndexChanged	Detect a change in the selected value of
CreateAggGradTable	Create a datatable that merges all the gradations of all the aggregates already entered by the user
dgv_CellFormatting	Override the cell formatting method of the dgvAggregateGradations2 control for appropriate decimal number rounding
DisplayGrdation	Bind the aggregate gradation datatable with the corresponding DataGridView controls
InitializeComponent	
populateCmbCertifiedTechnician	Retrieve data from the database and populate the ComboBox
populateCmbGradationEffectiveDate	Retrieve data from the database and populate the ComboBox

Fields

Name	Description
__ENCList	
_btnAddAggregate1	
_btnAddAggregate2	
_btnAddAggregate3	
_btnAddAggregate4	
_btnAddAggregate5	
_btnAddAggregate6	
_cmbCertifiedTechnician	
_cmbGradationEffectiveDate	
_DateTimePicker1	
_dgvAgg1	
_dgvAgg2	
_dgvAgg3	
_dgvAgg4	
_dgvAgg5	
_dgvAgg6	

Name	Description
_dgvSieve	
_grpGradation	
_lblSelectCertifiedTechnician	
_lblSelectGradationEffectiveDate	
_lblSelectTestDate	
_tlpGradation	
_txtAgg0	
_txtAgg2	
_txtAgg3	
_txtAgg4	
_txtAgg5	
_txtAgg6	
_txtMixType	
btnList	
btns	
components	
dgvList	
dgvs	
tblCertifiedTechnician	
tblGradationEffectiveDate	
txtList	
txts	

frmGSBTest_4 Class

Contains the code for the frmGSBTest windows form which takes care of the GSB test calculations.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
```
public class frmGSBTest_4 : Form
```
Visual Basic
```
Public Class frmGSBTest_4 _
        Inherits Form
```
Visual C++
```
public ref class frmGSBTest_4 : public Form
```

Inheritance Hierarchy
System.Object
  System.MarshalByRefObject
    System.ComponentModel.Component
      System.Windows.Forms.Control
        System.Windows.Forms.ScrollableControl
          System.Windows.Forms.ContainerControl
            System.Windows.Forms.Form
              VB_ODOT_ACMIX.frmGSBTest_4

frmGSBTest_4 Members

The frmGSBTest_4 type exposes the following members.

Constructors

Name	Description
frmGSBTest_4	
frmGSBTest_4	Initializes a new instance of the frmGSBTest_4 class

Methods

Name	Description
__ENCAddToList	
calculateCoarseGSB	Execute or update controls and fields with the appropriate calculations. Calculate Coarse Gsb
calculateFineGSB	Execute or update controls and fields with the appropriate calculations. Calculate Fine Gsb
calculateGSB	Execute or update controls and fields with the appropriate calculations. Calculate Average Gsb
frmGSBTest_Load	Load the frmGSBTest_4 windows form and

Name	Description
	populate its controls with the appropriate data
InitializeComponent	
populateCmbCertifiedTechnician	Retrieve data from the database and populate the ComboBox
txtBox_TextChanged_1	Detect a textbox value change and perform the appropriate actions
txtCombinedGSB_TextChanged	Detect a textbox value change and perform the appropriate actions
txtFine_AverageGSB_TextChanged	Detect a textbox value change and perform the appropriate actions

Fields

Name	Description
__ENCList	
_cmbCertifiedTechnician	
_DateTimePicker1	
_grpCoarseAgg	
_grpFineAgg	
_Label4	
_Label5	
_lblAvgCoarseGSB	
_lblAvgFineGSB	
_lblCoarseA	
_lblCoarseB	
_lblCoarseC	
_lblCoarseGSB	
_lblCombinedGSB	
_lblFineA	
_lblFineB	
_lblFineC	
_lblFineGSB	
_lblFineS	
_lblFineSample1	
_lblFineSample2	
_lblGSBTestCode	
_lblGSBTestTitle	
_lblSelectCertifiedTechnician	
_lblSelectTestDate	
_TableLayoutPanel1	
_txtCoarse_AverageGSB	

Name	Description
_txtCoarse_GSB1	
_txtCoarse_GSB2	
_txtcoarseImmersedWt1	
_txtcoarseImmersedWt2	
_txtcoarseOvenDryWt1	
_txtcoarseOvenDryWt2	
_txtcoarseSaturatedSurfaceDryWt1	
_txtcoarseSaturatedSurfaceDryWt2	
_txtCombinedGSB	
_txtFine_AverageGSB	
_txtFine_GSB1	
_txtFine_GSB2	
_txtfineOvenDryWt1	
_txtfineOvenDryWt2	
_txtfinePycnometerSpecimenWaterWt1	
_txtfinePycnometerSpecimenWaterWt2	
_txtfinePycnometerWaterWt1	
_txtfinePycnometerWaterWt2	
_txtfineSaturatedSurfaceDryWt1	
_txtfineSaturatedSurfaceDryWt2	
components	
tblCertifiedTechnician	

frmHamburg_13 Class

Contains the code for the frmHamburg_13 windows form which takes care of the Hamburg test calculations.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
```
public class frmHamburg_13 : Form
```
Visual Basic
```
Public Class frmHamburg_13 _
        Inherits Form
```
Visual C++
```
public ref class frmHamburg_13 : public Form
```

Inheritance Hierarchy
System.Object
  System.MarshalByRefObject
    System.ComponentModel.Component
      System.Windows.Forms.Control
        System.Windows.Forms.ScrollableControl
          System.Windows.Forms.ContainerControl
            System.Windows.Forms.Form
              VB_ODOT_ACMIX.frmHamburg_13

frmHamburg_13 Members

The frmHamburg_13 type exposes the following members.

Constructors

Name	Description
frmHamburg_13	
frmHamburg_13	Initializes a new instance of the frmHamburg_13 class

Methods

Name	Description
__ENCAddToList	
calculateAbsorption14	Execute or update controls and fields with the appropriate calculations. Calculate Absorption
calculateCV45	Execute or update controls and fields with the appropriate calculations
calculateGmb14	Execute or update controls and fields with the appropriate calculations. Calculate Gmb

Name	Description
calculateGmb45	Execute or update controls and fields with the appropriate calculations. Calculate Gmb
calculateOHDL14	Execute or update controls and fields with the appropriate calculations
calculateOHDL45	Execute or update controls and fields with the appropriate calculations
calculatePtDensity14	Execute or update controls and fields with the appropriate calculations. Calculate densities
calculatePtDensity45	Execute or update controls and fields with the appropriate calculations. Calculate percent density
calculatePtPa14	Execute or update controls and fields with the appropriate calculations. Calculate percent air voids content
calculatePtPa45	Execute or update controls and fields with the appropriate calculations. Calculate percent air voids content
calculateRequiedNumberofPasses	Execute or update controls and fields with the appropriate calculations
dgvOHDL14_CellValueChanged	Perform the appropriate calculation upon a cell value change in dgvOHDL14
dgvOHDL14_DataError	Detect data type errors in the dgvOHDL14 DataGridView and act accordingly
dgvOHDL45_CellValueChanged	Perform the appropriate calculation upon a cell value change in dgvOHDL45
dgvOHDL45_DataError	Detect data type errors in the dgvOHDL45 DataGridView and act accordingly
dgvRut1_CellValueChanged	Perform the appropriate calculation upon a cell value change in dgvRut1
dgvRut1_DataError	Detect data type errors in the dgvRut1 DataGridView and act accordingly
frmHamburg_Load	Load the frmHamburg_13 windows form and populate its controls with the appropriate data
InitializeComponent	
populateBagSize45	Populate controls and fields with the appropriate data and format
populateCmbCertifiedTechnician	Retrieve data from the database and populate the ComboBox
populateGmm14	Populate controls and fields with the appropriate data and format
populateGmm45	Populate controls and fields with the appropriate data and format

Fields

Name	Description

Name	Description
__ENCList	
_cmbCertifiedTechnician	
_DateTimePicker1	
_dgvOHDL14	
_dgvOHDL45	
_dgvRut1	
_dgvRut2	
_Label1	
_Label2	
_Label3	
_Label4	
_lblHamburgCode	
_lblHamburgTitle	
_lblSelectCertifiedTechnician	
_lblSelectTestDate	
_TabControl1	
_TableLayoutPanel1	
_TabPage1	
_TabPage2	
_TabPage3	
_txtAsphaltCement	
_txtMixType	
bufferRutTest	
components	
loaded	
RNP	
tblCertifiedTechnician	

frmInfo_1 Class

Contains the code for the frmGradation windows which allows the user to enter general mix design information.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
```
public class frmInfo_1 : Form
```
Visual Basic
```
Public Class frmInfo_1 _
        Inherits Form
```
Visual C++
```
public ref class frmInfo_1 : public Form
```

Inheritance Hierarchy
System.Object
  System.MarshalByRefObject
    System.ComponentModel.Component
      System.Windows.Forms.Control
        System.Windows.Forms.ScrollableControl
          System.Windows.Forms.ContainerControl
            System.Windows.Forms.Form
              VB_ODOT_ACMIX.frmInfo_1

frmInfo_1 Members

The frmInfo_1 type exposes the following members.

Constructors

Name	Description
frmInfo_1	
frmInfo_1	Initializes a new instance of the frmInfo_1 class

Methods

Name	Description
__ENCAddToList	
ACMIX_Process_Info_Load	Load the frmInfo_1 windows form and populate its controls with the appropriate data
btnSelectProjectNumber_Click	The Select Project button is clicked, an instance of the frmSelectProject is created to select a project
cmbSelectAggregateNMS_SelectedIndexChanged	Archive a change in the selected item of

Name	Description
	cmbSelectAggregateNMS
cmbSelectDesigner_SelectedIndexChanged	Archive a change in the selected item of cmbSelectDesigner
cmbSelectDesignType_SelectedIndexChanged	Archive a change in the selected item of cmbSelectDesignType
cmbSelectLab_SelectedIndexChanged	Archive a change in the selected item of cmbSelectLab
cmbSelectMixCategory_SelectedIndexChanged	Archive a change in the selected item of cmbSelectMixCategory
cmbSelectMixType_SelectedIndexChanged	Archive a change in the selected item of cmbSelectMixType
cmbSelectPlant_SelectedIndexChanged	Archive a change in the selected item of cmbSelectPlant
cmbSelectProducer_SelectedIndexChanged	Archive a change in the selected item of cmbSelectProducer
cmbSelectProject_SelectedIndexChanged	Archive a change in the selected item of cmbSelectProject
dtSubmitted_ValueChanged	Archive a change in the created date field of the mix design
GenerateMixID	Generate a mix design ID based on "TTLLLLLYYSSSCR" format
InitializeComponent	
IsInfoFormComplete	Cehck if the mix information tab has the essential (Mix Category, Aggregate NMS, Mix Type, and Design Lab) components to move on with the mix design process
populateCmbSelectAggregateNMS	Retrieve data from the database and populate the cmbSelectAggregateNMS ComboBox
populateCmbSelectDesigner	Retrieve data from the database and populate the cmbSelectDesigner ComboBox
populateCmbSelectDesignType	Retrieve data from the database and populate the cmbSelectDesignType ComboBox
populateCmbSelectLab	Retrieve data from the database and populate the cmbSelectLab ComboBox
populateCmbSelectMixCategory	Retrieve data from the database and populate the cmbSelectMixCategory ComboBox
populateCmbSelectMixType	Retrieve data from the database and populate the cmbSelectMixType ComboBox
populateCmbSelectPlant	Retrieve data from the database and populate the cmbSelectPlant ComboBox
populateCmbSelectProducer	Retrieve data from the database and populate the cmbSelectProducer ComboBox
populateCmbSelectProject	Retrieve data from the database and populate the cmbSelectProject ComboBox
populateMaterialIdInfo	Acrhive a change in the asphalt mix material
rbBatchingOption1_CheckedChanged	Detect a radio button change in

Name	Description
	rbBatchingOption1 and Set the appropriate batching option
rbBatchingOption2_CheckedChanged	Detect a radio button change in rbBatchingOption2 and Set the appropriate batching option
rbGradationTestData_CheckedChanged	Detect a radio button change in rbGradationTestData and Set the appropriate gradation method
rbHistoricalData_CheckedChanged	Detect a radio button change in rbHistoricalData and Set the appropriate gradation method

Fields

Name	Description
__ENCList	
_btnSelectProjectNumber	
_cmbSelectAggregateNMS	
_cmbSelectDesigner	
_cmbSelectDesignType	
_cmbSelectLab	
_cmbSelectMixCategory	
_cmbSelectMixType	
_cmbSelectPlant	
_cmbSelectProducer	
_cmbSelectProject	
_dtSubmitted	
_grpBatchingOptions	
_grpGradationOptions	
_grpInfo	
_HelpProvider1	
_Label1	
_Label10	
_Label2	
_Label3	
_Label4	
_Label5	
_Label6	
_Label7	
_Label8	
_Label9	
_lblDate	
_lblMixID	

Name	Description
_lbl	
_lblSelectAggSize	
_lblSelectBinderType	
_lblSelectDesigner	
_lblSelectDesignType	
_lblSelectLab	
_lblSelectMixCategory	
_lblSelectPlant	
_lblSelectProducer	
_lblSelectProject	
_rbBatchingOption1	
_rbBatchingOption2	
_rbGradationTestData	
_rbHistoricalData	
_TableLayoutPanel1	
_ttInfo	
_txtMixID	
_txt	
components	
frmSelectProj	
loaded	
MixID	
MixPlantPopulated	
mixTypePopulated	
tblDesigner	
tblDesignLab	
tblDesignType	
tblMixCategory	
tblMixClass	
tblMixType	
tblPlant	
tblProducer	
tblProjects	

frmIOC_9 Class

Contains the code for the frmIOC_9 windows form which takes care of the IOC test calculations.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
```
public class frmIOC_9 : Form
```
Visual Basic
```
Public Class frmIOC_9 _
        Inherits Form
```
Visual C++
```
public ref class frmIOC_9 : public Form
```

Inheritance Hierarchy
System.Object
  System.MarshalByRefObject
    System.ComponentModel.Component
      System.Windows.Forms.Control
        System.Windows.Forms.ScrollableControl
          System.Windows.Forms.ContainerControl
            System.Windows.Forms.Form
              VB_ODOT_ACMIX.frmIOC_9

frmIOC_9 Members

The frmIOC_9 type exposes the following members.

Constructors

Name	Description
frmIOC_9	
frmIOC_9	Initializes a new instance of the frmIOC_9 class

Methods

Name	Description
__ENCAddToList	
calculatePtIOC	Execute or update controls and fields with the appropriate calculations. Calculate Loss (%)
frmIOC_Load	Load the frmIOC_9 windows form and populate its controls with the appropriate data
InitializeComponent	
nud_ValueChanged	Detect a NumericUpDown control value change and perform the appropriate actions

Name	Description
populateCmbCertifiedTechnician	Retrieve data from the database and populate the ComboBox
txtAveragePtIOC_TextChanged	Detect a textbox value change and perform the appropriate actions
txtBox_TextChanged	Detect a textbox value change and perform the appropriate actions

Fields

Name	Description
__ENCList	
_cmbCertifiedTechnician	
_DateTimePicker1	
_grpIOC	
_Label1	
_Label10	
_Label2	
_Label3	
_Label4	
_Label5	
_Label6	
_Label7	
_Label8	
_Label9	
_lblIOCCode	
_lblIOCTitle	
_lblSample1	
_lblSample2	
_lblSelectCertifiedTechnician	
_lblSelectTestDate	
_nudmmelapsedTime1	
_nudmmelapsedTime2	
_nudsselapsedTime1	
_nudsselapsedTime2	
_TableLayoutPanel1	
_txtasphaltBinderPt1	
_txtasphaltBinderPt2	
_txtAveragePtIOC	
_txtcompensationTemp1	
_txtcompensationTemp2	
_txtLossPt1	

Name	Description
_txtLossPt2	
_txtlossWt1	
_txtlossWt2	
_txtPtIOC1	
_txtPtIOC2	
_txtsampleWt1	
_txtsampleWt2	
components	
loaded	
tblCertifiedTechnician	

frmPermeability_12 Class

Contains the code for the frmPermeability_12 windows form which takes care of the Permeability test calculations.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
```
public class frmPermeability_12 : Form
```
Visual Basic
```
Public Class frmPermeability_12 _
        Inherits Form
```
Visual C++
```
public ref class frmPermeability_12 : public Form
```

Inheritance Hierarchy
System.Object
  System.MarshalByRefObject
    System.ComponentModel.Component
      System.Windows.Forms.Control
        System.Windows.Forms.ScrollableControl
          System.Windows.Forms.ContainerControl
            System.Windows.Forms.Form
              VB_ODOT_ACMIX.frmPermeability_12

frmPermeability_12 Members

The frmPermeability_12 type exposes the following members.

Constructors

Name	Description
frmPermeability_12	
frmPermeability_12	Initializes a new instance of the frmPermeability_12 class

Methods

Name	Description
__ENCAddToList	
calculateAverageArea	Execute or update controls and fields with the appropriate calculations. Calculate average area (PI()*(($H$13/10)/2)^2))
calculateAverageDiameter	Execute or update controls and fields with the appropriate calculations. Calculate average diameter
calculateAverageHeight	Execute or update controls and fields with the appropriate calculations. Calculate average height

Name	Description
calculateCoeffPermeability	Execute or update controls and fields with the appropriate calculations. (100000*(ROUND(((B19*B20)/(B21*B25))*LN(B26/B27)*B28,10)))
calculateGmb3	Execute or update controls and fields with the appropriate calculations. Caclulate Gmb
calculateHead1	Execute or update controls and fields with the appropriate calculations. Calculate head1 = B20+B22+B23
calculateHead2	Execute or update controls and fields with the appropriate calculations. Calculate head2 = B20+B22+B24
calculateMaxK	Execute or update controls and fields with the appropriate calculations. Calculate the maximum K value (maximum of 3 runs)
calculatePermeability	Execute or update controls and fields with the appropriate calculations
calculatePtDensity3	Execute or update controls and fields with the appropriate calculations. Calculate % Density
calculateTempCorr	Execute or update controls and fields with the appropriate calculations
calculateThickness	Execute or update controls and fields with the appropriate calculations. Calculate thickness L (cm) = AverageL (mm) / 10
dgvPermeability1_CellValueChanged	Perform the appropriate calculation upon a cell value change in dgvPermeability1
dgvPermeability1_DataError	Detect data type errors in the dgvPermeability1 DataGridView and act accordingly
dgvPermeability2_CellValueChanged	Perform the appropriate calculation upon a cell value change in dgvPermeability2
dgvPermeability2_DataError	Detect data type errors in the dgvPermeability2 DataGridView and act accordingly
dgvPermeability3_CellValueChanged	Perform the appropriate calculation upon a cell value change in dgvPermeability3
dgvPermeability3_DataError	Detect data type errors in the dgvPermeability3 DataGridView and act accordingly
frmPermeability_Load	Load the frmPermeability_12 windows form and populate its controls with the appropriate data
InitializeComponent	
populateCmbCertifiedTechnician	Retrieve data from the database and populate the ComboBox

Fields

Name	Description
__ENCList	
_cmbCertifiedTechnician	
_DateTimePicker1	
_dgvPermeability1	

Name	Description
_dgvPermeability2	
_dgvPermeability3	
_GroupBox1	
_GroupBox2	
_Label1	
_Label2	
_lblPermeabilityCode	
_lblPermeabilityTitle	
_lblSelectCertifiedTechnician	
_lblSelectTestDate	
_TableLayoutPanel1	
_TextBox1	
components	
loaded	
mCell_Label	
tblCertifiedTechnician	

frmPrint Class

Contains the code for printing windows forms.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
```
public class frmPrint : Form
```
Visual Basic
```
Public Class frmPrint _
        Inherits Form
```
Visual C++
```
public ref class frmPrint : public Form
```

Inheritance Hierarchy
```
System.Object
  System.MarshalByRefObject
    System.ComponentModel.Component
      System.Windows.Forms.Control
        System.Windows.Forms.ScrollableControl
          System.Windows.Forms.ContainerControl
            System.Windows.Forms.Form
              VB_ODOT_ACMIX.frmPrint
```

frmPrint Members

The frmPrint type exposes the following members.

Constructors

Name	Description
frmPrint	
frmPrint	Initializes a new instance of the frmPrint class

Methods

Name	Description
__ENCAddToList	
btnPrint_Click_1	Send print order to a printer to print the selected forms
btnPrintPreview_Click	Show a print preview of the selected forms
frmPrint_Load	Load the frmPrint and collect a list of the active mix design tabs
InitializeComponent	
resizeCheckedListBox	Resize the CheckedListBox to fit on the print form

Fields

Name	Description
__ENCList	
_btnPrint	
_btnPrintPreview	
_clbFormsToPrint	
_PrintForm1	
components	
listForms	
visibleForm	

frmRiceTest_5 Class

Contains the code for the frmRiceTest windows form which takes care of the Rice test calculations.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
```
public class frmRiceTest_5 : Form
```
Visual Basic
```
Public Class frmRiceTest_5 _
        Inherits Form
```
Visual C++
```
public ref class frmRiceTest_5 : public Form
```

Inheritance Hierarchy
System.Object
  System.MarshalByRefObject
    System.ComponentModel.Component
      System.Windows.Forms.Control
        System.Windows.Forms.ScrollableControl
          System.Windows.Forms.ContainerControl
            System.Windows.Forms.Form
              VB_ODOT_ACMIX.frmRiceTest_5

frmRiceTest_5 Members

The frmRiceTest_5 type exposes the following members.

Constructors

Name	Description
frmRiceTest_5	
frmRiceTest_5	Initializes a new instance of the frmRiceTest_5 class

Methods

Name	Description
__ENCAddToList	
calculateGmm	Execute or update controls and fields with the appropriate calculations. Calculate Gmm
calculateGse	Execute or update controls and fields with the appropriate calculations. Calculate Gse
frmRiceTest_Load	Load the frmRiceTest_5 windows form and populate its controls with the appropriate data
InitializeComponent	

Name	Description
nudflaskNumber2_ValueChanged_1	Detect a value change in nudflaskNumber2 NumericUpDown control and perfom the appropriate actions
populateCmbCertifiedTechnician	Retrieve data from the database and populate the ComboBox
populateFiber	Populate controls and fields with the appropriate data and format
txtflaskNumber1_TextChanged	Detect a textbox value change and perform the appropriate actions
txtGse_TextChanged	Detect a textbox value change and perform the appropriate actions
txtPtAC_TextChanged	Detect a textbox value change and perform the appropriate actions

Fields

Name	Description
__ENCList	
_cmbCertifiedTechnician	
_DateTimePicker1	
_grpRice	
_Label1	
_Label10	
_Label11	
_Label2	
_Label3	
_Label4	
_Label5	
_Label6	
_Label7	
_Label8	
_Label9	
_lblRiceTestCode	
_lblRiceTestTitle	
_lblSample1	
_lblSample2	
_lblSelectCertifiedTechnician	
_lblSelectTestDate	
_nudflaskNumber1	
_nudflaskNumber2	
_TableLayoutPanel1	
_txtAverageGmm	
_txtflaskWaterSampleWt1	
_txtflaskWaterSampleWt2	

Name	Description
_txtflaskWaterWt1	
_txtflaskWaterWt2	
_txtGb	
_txtGf	
_txtGmm1	
_txtGmm2	
_txtGse	
_txtPtAC	
_txtPtCF	
_txtsampleWt1	
_txtsampleWt2	
components	
loaded	
tblCertifiedTechnician	

frmSandEquivalent_8 Class

Contains the code for the frmSandEquivalent_8 windows form which takes care of the Sand Equivalent test calculations.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
```
public class frmSandEquivalent_8 : Form
```
Visual Basic
```
Public Class frmSandEquivalent_8 _
        Inherits Form
```
Visual C++
```
public ref class frmSandEquivalent_8 : public Form
```

Inheritance Hierarchy
```
System.Object
  System.MarshalByRefObject
    System.ComponentModel.Component
      System.Windows.Forms.Control
        System.Windows.Forms.ScrollableControl
          System.Windows.Forms.ContainerControl
            System.Windows.Forms.Form
              VB_ODOT_ACMIX.frmSandEquivalent_8
```

frmSandEquivalent_8 Members

The frmSandEquivalent_8 type exposes the following members.

Constructors

Name	Description
frmSandEquivalent_8	
frmSandEquivalent_8	Initializes a new instance of the frmSandEquivalent_8 class

Methods

Name	Description
__ENCAddToList	
calculateSandEqu	Execute or update controls and fields with the appropriate calculations. Calculate Sand equivalent
frmSandEquivalent_Load	Load the frmSandEquivalent_8 windows form and populate its controls with the appropriate data
InitializeComponent	
nudtinNumber1_ValueChanged	Detect a value change in nudtinNumber1 NumericUpDown

Name	Description
	control and perfom the appropriate actions
populateCmbCertifiedTechnician	Retrieve data from the database and populate the ComboBox
txtAverageSandEquivalent_TextChanged	Detect a textbox value change and perform the appropriate actions
txtclayReading2_TextChanged	Detect a textbox value change and perform the appropriate actions

Fields

Name	Description
__ENCList	
_cmbCertifiedTechnician	
_DateTimePicker1	
_grpSandEquivalent	
_Label1	
_Label5	
_Label6	
_Label7	
_Label9	
_lblSample1	
_lblSample2	
_lblSandEquivalentCode	
_lblSandEquivalentTitle	
_lblSelectCertifiedTechnician	
_lblSelectTestDate	
_nudtinNumber1	
_nudtinNumber2	
_TableLayoutPanel1	
_txtAverageSandEquivalent	
_txtclayReading1	
_txtclayReading2	
_txtSandEquivalent1	
_txtSandEquivalent2	
_txtsandReading1	
_txtsandReading2	
components	
loaded	
tblCertifiedTechnician	

frmSelectProject Class

A popup window that allows the user to select a project.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
```
public class frmSelectProject : Form
```
Visual Basic
```
Public Class frmSelectProject _
        Inherits Form
```
Visual C++
```
public ref class frmSelectProject : public Form
```

Inheritance Hierarchy
System.Object
  System.MarshalByRefObject
    System.ComponentModel.Component
      System.Windows.Forms.Control
        System.Windows.Forms.ScrollableControl
          System.Windows.Forms.ContainerControl
            System.Windows.Forms.Form
              VB_ODOT_ACMIX.frmSelectProject

frmSelectProject Members

The frmSelectProject type exposes the following members.

Constructors

Name	Description
frmSelectProject	
frmSelectProject	Initializes a new instance of the frmSelectProject class

Methods

Name	Description
__ENCAddToList	
btnSelect_Click	Insert the select project information into the Database ready table
FilterTable	Perform a real-time filtering of the displayed projects in the DataGridView based on contract ID, vendor name, and route number
InitializeComponent	
PopulateProjects	Populate the control with the appropriate data and format

Name	Description
SelectProject_Load	Load the frmSelectProject windows form and populate its controls with the appropriate data
txtContractID_TextChanged	Detect a textbox value change and perform the appropriate actions
txtRouteNumber_TextChanged	Detect a textbox value change and perform the appropriate actions
txtVendorName_TextChanged	Detect a textbox value change and perform the appropriate actions

Fields

Name	Description
__ENCList	
_btnCancel	
_btnSelect	
_dgvProjects	
_lblContractID	
_lblRouteNumber	
_lblVendorName	
_SplitContainer1	
_txtContractID	
_txtRouteNumber	
_txtVendorName	
components	
tblFilterProjects	
tblFilterProjectsFiltered	

frmSSDTest_6 Class

Contains the code for the frmSSDTest_6 windows form which takes care of the SSD test calculations.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
```
public class frmSSDTest_6 : Form
```
Visual Basic
```
Public Class frmSSDTest_6 _
        Inherits Form
```
Visual C++
```
public ref class frmSSDTest_6 : public Form
```

Inheritance Hierarchy
System.Object
  System.MarshalByRefObject
    System.ComponentModel.Component
      System.Windows.Forms.Control
        System.Windows.Forms.ScrollableControl
          System.Windows.Forms.ContainerControl
            System.Windows.Forms.Form
              VB_ODOT_ACMIX.frmSSDTest_6

frmSSDTest_6 Members

The frmSSDTest_6 type exposes the following members.

Constructors

Name	Description
frmSSDTest_6	
frmSSDTest_6	Initializes a new instance of the frmSSDTest_6 class

Methods

Name	Description
__ENCAddToList	
calculateAbsorptionNmax	Execute or update controls and fields with the appropriate calculations. Caclculate Absorption @ Nmax Absorption = 100 * (SSD - Air) / (SSD - Water)
calculateAbsorptionSSD	Execute or update controls and fields with the appropriate calculations. Caclculate Absorption Absorption = 100 * (SSD - Air) / (SSD - Water)
calculateAvgGmbNini	Execute or update controls and fields with the appropriate

Name	Description
	calculations
calculateAvgGmbNmax	Execute or update controls and fields with the appropriate calculations. Calculate Average Gmb @ Nmax
calculateAvgGmbSSD	Execute or update controls and fields with the appropriate calculations. Calculate Average Gmb
calculateAvgHtNdes	Execute or update controls and fields with the appropriate calculations
calculateAvgHtNini	Execute or update controls and fields with the appropriate calculations
calculateDPSSD2	Execute or update controls and fields with the appropriate calculations. Calculate DP DP = ROUND(P0075/Pbe,1)
calculateGmbNmax	Execute or update controls and fields with the appropriate calculations. Calculate Gmb @ Nmax Gmb = Air / (SSD - Water)
calculateGmbSSD	Execute or update controls and fields with the appropriate calculations. Calculate Gmb Gmb = Air / (SSD - Water)
calculateGmm	Execute or update controls and fields with the appropriate calculations. Calculate Gmm
calculateNini	Execute or update controls and fields with the appropriate calculations
calculateNmax	Execute or update controls and fields with the appropriate calculations
calculatePbeSSD2	Execute or update controls and fields with the appropriate calculations. Calculate Pbe Pbe = ROUND(Pb-((Gse-Gsb)/(Gse*Gsb))*((100-Pb)*Gb),1)
calculatePtDensityNini	Execute or update controls and fields with the appropriate calculations.
calculatePtDensityNini2	Execute or update controls and fields with the appropriate calculations. Calculate Percent Density % Gmm = 100 * Gmb / Gmm
calculatePtDensityNmax	Execute or update controls and fields with the appropriate calculations. Calculate Percent Density @ Nmax Density = 100 * Gmb / Gmm
calculatePtDensityNmax2	Execute or update controls and fields with the appropriate calculations. Calculate Percent Density @ Nmax Density = 100 * Gmb / Gmm
calculatePtDensitySSD	Execute or update controls and fields with the appropriate calculations. Calculate Percent Density Density = 100 * Gmb / Gmm
calculatePtDensitySSD2	Execute or update controls and fields with the appropriate calculations. Calculate Percent Density % Gmm = 100 * Gmb / Gmm
calculatePtVFASSD2	Execute or update controls and fields with the appropriate calculations. Calculate Percent VFA % VFA = ROUND(100*((%VMA-(100-%Gmm))/%VMA),1) Or IsDBNull() Or IsNothing()
calculatePtVMASSD	Execute or update controls and fields with the appropriate calculations. Calculate Percent VMA % VMA = 100 * (Gmb / Gsb) * (100 - Pb)
calculatePtVMASSD2	Execute or update controls and fields with the appropriate calculations. Calculate Percent VMA % VMA = 100 * (Gmb / Gsb) *

Name	Description
	(100 - Pb)
calculateSSD1	Execute or update controls and fields with the appropriate calculations
calculateSSD2	Execute or update controls and fields with the appropriate calculations
dgvNini1_CellValueChanged	Perform the appropriate calculation upon a cell value change in dgvNini1
dgvNini1_DataError	Detect data type errors in the dgvNini1 DataGridView and act accordingly
dgvNini2_CellValueChanged	Perform the appropriate calculation upon a cell value change in dgvNini2
dgvNmax1_CellValueChanged	Perform the appropriate calculation upon a cell value change in dgvNmax1
dgvNmax1_DataError	Detect data type errors in the dgvNmax1 DataGridView and act accordingly
dgvNmax2_CellValueChanged	Perform the appropriate calculation upon a cell value change in
dgvNmax2_DataError	Detect data type errors in the dgvNmax2 DataGridView and act accordingly
dgvSSD1_CellValueChanged	Perform the appropriate calculation upon a cell value change in dgvSSD1
dgvSSD1_DataError	Detect data type errors in the dgvSSD1 DataGridView and act accordingly
dgvSSD2_CellValueChanged	Perform the appropriate calculation upon a cell value change in dgvSSD2
dgvSSD2_DataError	Detect data type errors in the dgvSSD2 DataGridView and act accordingly
frmSSDTest_Load	Load the frmSSDTest_6 windows form and populate its controls with the appropriate data
InitializeComponent	
populateCmbCertifiedTechnician	Retrieve data from the database and populate the ComboBox
populateDBdata	Populate controls and fields with the appropriate data and format
populatePb	Populate controls and fields with the appropriate data and format
rbAutomatic_CheckedChanged	Detect a radio button change in rbAutomatic and Set the appropriate format
rbUser_CheckedChanged	Detect a radio button change in rbUser and Set the appropriate format
txtGb_TextChanged	Detect a textbox value change and perform the appropriate actions
txtGse_TextChanged	Detect a textbox value change and perform the appropriate actions

Fields

Name	Description
__ENCList	
_cmbCertifiedTechnician	
_DateTimePicker1	

Name	Description
_dgvNini1	
_dgvNini2	
_dgvNmax1	
_dgvNmax2	
_dgvSSD1	
_dgvSSD2	
_grpEstimatedOption	
_Label1	
_Label2	
_Label3	
_Label4	
_lblSelectCertifiedTechnician	
_lblSelectTestDate	
_lblSSDTestCode	
_lblSSDTestTitle	
_rbAutomatic	
_rbUser	
_TabControl1	
_TableLayoutPanel1	
_TabPage1	
_TabPage2	
_TabPage3	
_txtGb	
_txtGsb	
_txtGse	
_txtP0075	
components	
loaded	
mCell_AvgGmb	
mCell_AvgHtNdes	
mCell_AvgHtNini	
mCell_HighPt_AgvGmb	
mCell_HighPt_Density	
mCell_HighPt_Gmm	
mCell_HighPt_Pb	
mCell_HighPt_VMA	
mCell_LowPt_AgvGmb	
mCell_LowPt_Density	
mCell_LowPt_Gmm	
mCell_LowPt_Pb	

Name	Description
mCell_LowPt_VMA	
mCell_TargetPt_AgvGmb	
mCell_TargetPt_Density	
mCell_TargetPt_Gmm	
mCell_TargetPt_Pb	
mCell_TargetPt_VMA	
tblCertifiedTechnician	

frmT283_11 Class

Contains the code for the T-283 windows form which takes care of the T-283 test calculations.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
```
public class frmT283_11 : Form
```
Visual Basic
```
Public Class frmT283_11 _
        Inherits Form
```
Visual C++
```
public ref class frmT283_11 : public Form
```

Inheritance Hierarchy
System.Object
  System.MarshalByRefObject
    System.ComponentModel.Component
      System.Windows.Forms.Control
        System.Windows.Forms.ScrollableControl
          System.Windows.Forms.ContainerControl
            System.Windows.Forms.Form
              VB_ODOT_ACMIX.frmT283_11

frmT283_11 Members

The frmT283_11 type exposes the following members.

Constructors

Name	Description
frmT283_11	
frmT283_11	Initializes a new instance of the frmT283_11 class

Methods

Name	Description
__ENCAddToList	
calculateGmbT283	Execute or update controls and fields with the appropriate calculations. Calculate Gmb = A / E
calculateHeight	Execute or update controls and fields with the appropriate calculations. Calculate Height t = ((10*E)/(π*7.52))
calculatePtAirVoids	Execute or update controls and fields with the appropriate calculations. Calculate Percent Air Voids % Pa = 100 - % Gmm

Name	Description
calculatePtGmm	Execute or update controls and fields with the appropriate calculations. Calculate Percent Density or % Gmm % Gmm = 100 * Gmb / Gmm
calculatePtSaturation	Execute or update controls and fields with the appropriate calculations. Calculate percent saturation %S' = 100 * J' / Va
calculateT283	Execute or update controls and fields with the appropriate calculations
calculateTensileStrength	Execute or update controls and fields with the appropriate calculations. Calculate Tensile Strength (2000 * 4.4482216 * P / (150 * t * 3.14159)) * 0.1450377)
calculateTSR	Execute or update controls and fields with the appropriate calculations. Calculate strength characteristics
calculateVolume	Execute or update controls and fields with the appropriate calculations. Calculate volume E = B - C
calculateVolumeAbsorbedWater	Execute or update controls and fields with the appropriate calculations. Calculate volume of absorbed water J' = B' - A
calculateVolumeAirVoids	Execute or update controls and fields with the appropriate calculations. Calculate volume air voids Va = %Pa * E / 100
dgvT283_CellValueChanged	Perform the appropriate calculation upon a cell value change in dgvT283
dgvT283_DataError	Detect data type errors in the dgvT283 DataGridView and act accordingly
frmT283_Load	Load the frmT283_11 windows form and populate its controls with the appropriate data
InitializeComponent	
populateCmbCertifiedTechnician	Retrieve data from the database and populate the ComboBox
txtS2_TextChanged	Detect a textbox value change and perform the appropriate actions
txtTSR_TextChanged	Detect a textbox value change and perform the appropriate actions

Fields

Name	Description
__ENCList	
_cmbCertifiedTechnician	
_DateTimePicker1	
_dgvT283	
_GroupBox1	
_Label1	
_Label2	
_Label3	
_Label4	

Name	Description
_Label5	
_Label6	
_lblSelectCertifiedTechnician	
_lblSelectTestDate	
_lblT283Code	
_lblT283Title	
_TableLayoutPanel1	
_txtS1	
_txtS2	
_txtTSR	
components	
loaded	
mCell_Gmm	
tblCertifiedTechnician	

frmTemperatures_14 Class

Contains the code for the frmTemperatures_14 windows form which takes care of the Temperatures calculations.

Namespace: VB_ODOT_ACMIX
Assembly: VB_ODOT-ACMIX (in VB_ODOT-ACMIX.exe) Version: 1.0.0.0 (1.0.0.0)

Syntax
C#
```
public class frmTemperatures_14 : Form
```
Visual Basic
```
Public Class frmTemperatures_14 _
        Inherits Form
```
Visual C++
```
public ref class frmTemperatures_14 : public Form
```

Inheritance Hierarchy
System.Object
  System.MarshalByRefObject
    System.ComponentModel.Component
      System.Windows.Forms.Control
        System.Windows.Forms.ScrollableControl
          System.Windows.Forms.ContainerControl
            System.Windows.Forms.Form
              VB_ODOT_ACMIX.frmTemperatures_14

frmTemperatures_14 Members

The frmTemperatures_14 type exposes the following members.

Constructors

Name	Description
frmTemperatures_14	
frmTemperatures_14	Initializes a new instance of the frmTemperatures_14 class

Methods

Name	Description
__ENCAddToList	
convertUnits	Convert the temperatures between Celsius and Fahrenheit
frmTemperatures_Load	Load the frmTemperatures_14 windows form and populate its controls with the appropriate data
InitializeComponent	
organizeUI	Format and populate the frmTemperatures_14 windows form

Name	Description
rbCelsius_CheckedChanged	Detect a radio button change in rbCelsius and perform the approriate calculations
rbFahrenheit_CheckedChanged	Detect a radio button change in rbFahrenheit and perform the approriate calculations
txtBox_TextChanged	Detect a textbox value change and perform the appropriate actions

Fields

Name	Description
__ENCList	
_grpTemperatures	
_Label1	
_Label5	
_Label6	
_Label7	
_lblTemperaturesCode	
_lblTemperaturesTitle	
_rbCelsius	
_rbFahrenheit	
_TableLayoutPanel1	
_txtdischargedTempC	
_txtdischargedTempF	
_txtlabCompactionTempC	
_txtlabCompactionTempF	
_txtlabMixingTempC	
_txtlabMixingTempF	
_txtNote	
_txtoptimumCompactionTempC	
_txtoptimumCompactionTempF	
components	
loaded	