FDOT

Florida Department of

TRANSPORTATION

Instructions for Computer Coding Aggregate Test Data

January 27, 2022

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Chapter 1   Sample Creation

This document provides instructions on entering and submitting aggregate test results data into the Department's Materials Acceptance and Certification (MAC) System database.

A MAC user must have approved security access. Instructions for obtaining an Internet Subscriber Account are found at http://www.fdot.gov/materials/mac/access/macisa.pdf

A. Logging in to MAC
    1. Sign In.
A user goes to MAC at https://mac.fdot.gov/ and clicks Log In. Click this Icon when it appears.
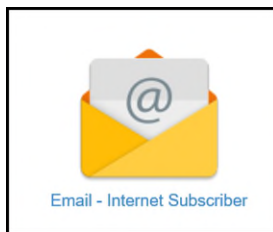
    2. Email and Password
    Enter your email and password when prompted.

B. Sample Data Entry and Submittal
    1. The Sample Life Cycle
    The Sample Life Cycle beings in MAC with Logging in a new sample. Click on "Manage Samples" in the upper right of the screen. Operations in MAC will involve a dynamic series of new screens that open after certain fields are entered.
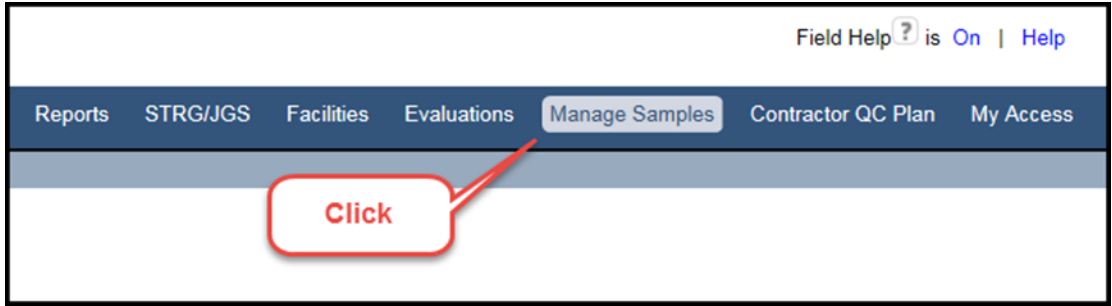
2. Log in a New Sample

Click on "Create Sample Login" screen appears. This is the first step to enter your specific sample data.
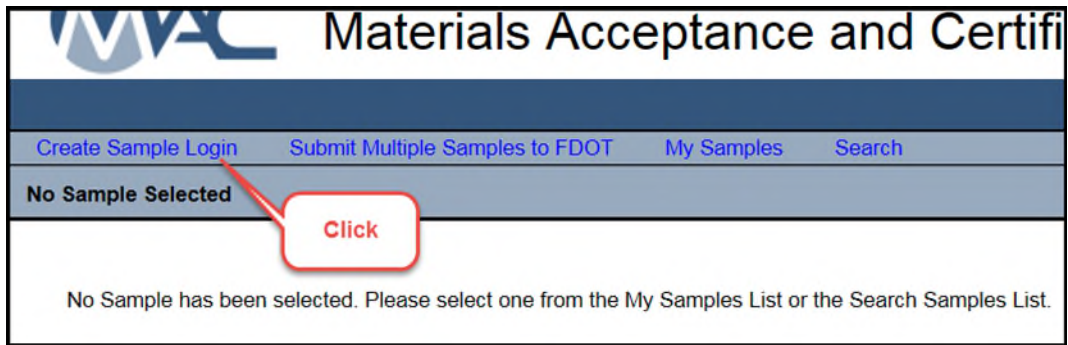
3. Sample Category

When the next screen opens, the Sample Category box will be on "Project", to the left of the drop-down arrow. Click the arrow (Step 1) and when the dropdown box opens, select "Program" (Step 2). For ease of illustration, both steps are shown in the diagram. Also, for convenience, the open dropdown box is re-drawn for this instruction document, and shown in the middle of the screen. It will actually appear in the same location as the Sample Category box.
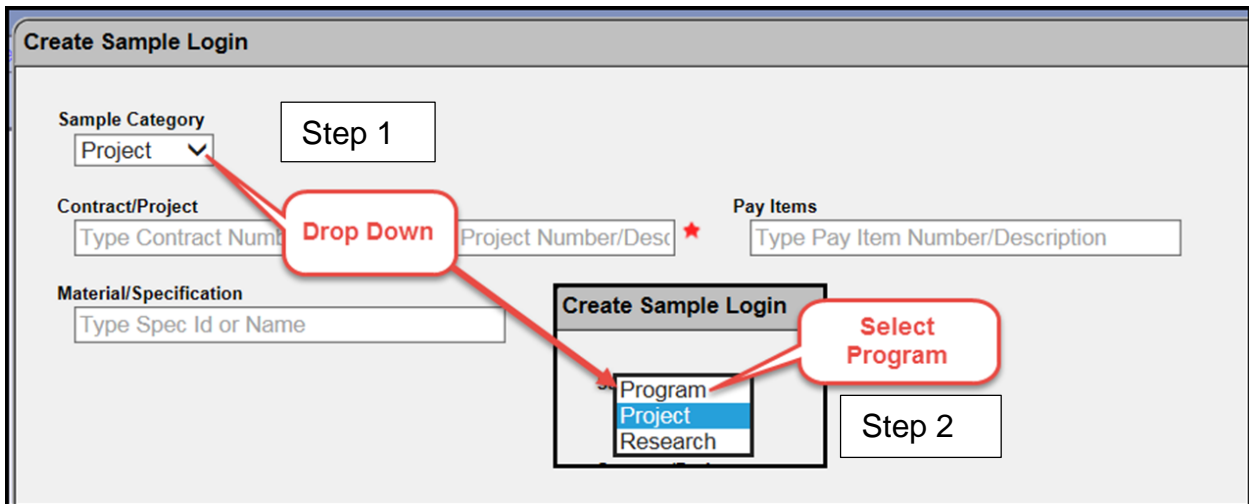
C. Entry Fields on Login Screen
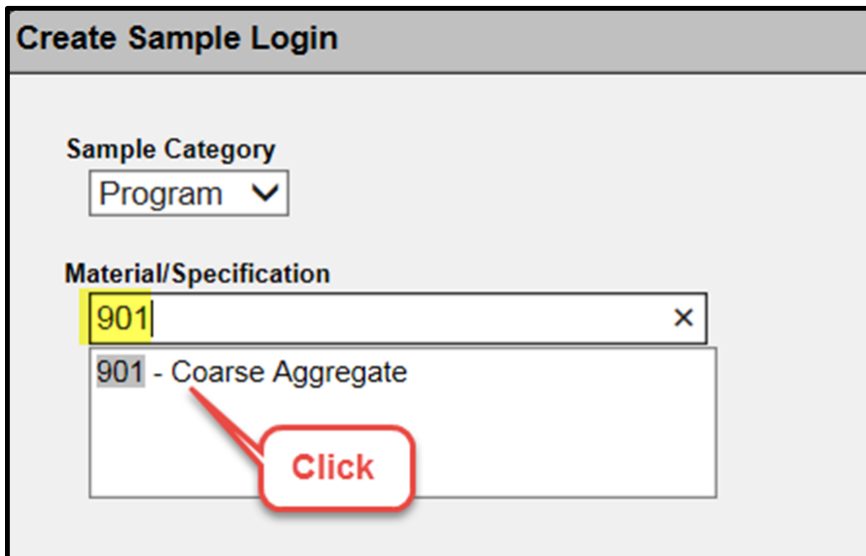
   1. "Material/Specification".

After selecting "Program" a new selection box appears for "Material/Specification". The options match the material Sections in the Standard Specifications for Road and Bridge Construction (Specifications) The options available will be:

- 901 – Coarse Aggregate
- 902 – Fine aggregate
- 911 – Base
- 530 – Riprap (Revetment Systems)
- 204 – Graded Aggregate Base

Type in the number the specification. The full MAC name appears below and you must click it to enter the field in the box. The following examples shows the choice for 901, Coarse aggregate

Click the new prompt when it appears.

   2. Select "Sample Level"

Click inside the next screen to get the dropdown box and select the "Sample Level"

The dropdown options in alphabetical order are:

- IA – Independent Assurance created by FDOT; also used in referee process
- IV – Independent Verification
- PC – Process Control
- QC – Quality Control
- QCA – Quality Control for approval to get Production Facility or Product approved
- QR – Quality Control for Producer's portion of split Sample
- RT – not used
- VT – FDOT Verification
- VR – Verification for FDOT's portion of split Sample
- VTA – Verification for FDOT to approve Production Facility or Product

3. Product Categories

A new dropdown box appears to select the "Category". The star to the right indicates that this is a mandatory field. Categories are the product codes. The product codes will match those available in the "Material/Specification" previously selected. Click to select a Category.

Create Sample Login

MAC Spec
902 - Fine Aggregate, Program [Aggregate Control Program], v1.6

← Return to Material Selection Screen

Sample Info

Method of Acceptance	Sample Level	Category
Sampling And Testing	QC	

F01
F02
F03
F04
F05
F06
F07
F08
Asphalt Screenings / F20
Asphalt Screenings / F21
Asphalt Screenings / F22
Asphalt Screenings / F23
Asphalt Screenings / F24
Asphalt Screenings / F25
Asphalt Screenings / F26
Asphalt Screenings / F27
Nothing

Click to select F01

Fine Aggregate Material Category and Code Description

Category/Code	Fine Aggregate Description
F01	Silica Sand #1 (Concrete)
F02	Silica Sand #2 Concrete
F03	Screenings #1 (Concrete)
F04	Screenings #2 (Concrete)
F05	Masonry Sand
F06	Sand (Sand Cement Rip-Rap)
F07	Concrete Pipe Plant Sand
F08	Underdrain Filter
F09	Screenings Research
F10	Silica Sand For FC-4
F20	Screenings #1 (Asphalt)
F21	Screenings #2 (Asphalt)
F22	Screenings #3 (Asphalt)
F23	Screenings #4 (Asphalt)
F24	Screenings #5 (Asphalt)
F25	Screenings #6 (Asphalt)
F26	Screenings #7 (Asphalt)
F27	Screenings #8 (Asphalt)
F28	Screenings #9 (Asphalt)
F29	Screenings #10 (Asphalt)

Coarse Aggregate Material Category and Code Description

Category/Code	Coarse Aggregate Description
C01	ASTM* or FL Grade #1
C02	ASTM or FL Grade #2
C03	ASTM or FL Grade #24
C04	ASTM or FL Grade #3
C05	ASTM or FL Grade #357
C06	ASTM or FL Grade #4
C07	ASTM or FL Grade #467
C08	ASTM or FL Grade #5
C09	ASTM or FL Grade #56
C10	ASTM or FL Grade #57
C11	ASTM or FL Grade #6
C12	ASTM or FL Grade #67
C13	ASTM or FL Grade #68
C14	ASTM or FL Grade #7
C15	ASTM or FL Grade #78
C16	ASTM or FL Grade #8
C17	ASTM or FL Grade #89
C18	ASTM or FL Grade #9
C19	ASTM or FL Grade #10

Note: * = American Standard for Testing and Materials

Coarse Aggregate Material Category and Code Description

Category/Code	Coarse Aggregate Description
C30	Bedding Stone
C31	Concrete Pipe Stone #1
C32	Bank and Shore Riprap
C33	Ditch Bank lining
C34	Gabion Basket Stone
C35	Concrete Pipe Stone #2
C36	Concrete Pipe Stone #3
C40	S1A* (Asphalt)
C41	S1A (Asphalt)
C42	S1A (Asphalt)
C43	S1A (Asphalt)
C44	S1A (Asphalt)
C45	S1A (Asphalt)
C46	S1A (Asphalt)
C47	S1A (Asphalt)
C48	S1A (Asphalt)
C49	S1A (Asphalt)
C50	S1B (Asphalt)
C51	S1B (Asphalt)
C52	S1B (Asphalt)
C53	S1B (Asphalt)
C54	S1B (Asphalt)
C55	S1B (Asphalt)
C56	S1B (Asphalt)
C57	S1B (Asphalt)
C58	S1B (Asphalt)
C59	S1B10 (Asphalt)
CL10	Lightweight Concrete Aggregate #57
CL12	Lightweight Concrete Aggregate #67
CL17	Lightweight Concrete Aggregate #89
CR06	#4 Recycled Concrete
CR10	#57 Recycled Concrete
C60	#4A AREMA** Ballast
C61	#5 AREMA Ballast
C62	AREMA Sub Ballast

Note: * = S = Structural, A and B are sizes, where A is larger than B

     ** = American Railway Engineering and Maintenance-of-Way Association

Base Aggregate Material Category and Code Description

Category/Code	Base Aggregate Description
B01	Limerock
B02	Bank Run Shell
B03	Cemented Coquina
B04	Limerock Stabilized Base
B05	Shell Stabilized Base
B06	Limerock Stabilizer
B07	Shell Stabilizer
B08	Dredged Shell
B09	Soil Cement
B10	Graded Aggregate Base
B11	Shellrock
B12	Recycled Concrete Aggregate
B14	Calcarenite

4. Select Mine or Terminal

The screen expands with new fields to be selected. The green highlight has been added to this document and only the text appears on the screen. This will be explained further.

Create Sample Login

MAC Spec
902 - Fine Aggregate, Program [Aggregate Control Program], v1.6

← Return to Material Selection Screen

Sample Info

Method of Acceptance	Sample Level	Category		Aggregate Production Facility	
Sampling And Testing	QC ▾	F01	▾	Type Production Facility Name	⭐

Product
Please select a Production Facility to get a list of eligible Products

Sampled By Tech
Type Technician Name or TIN ⭐   **Date Sample Taken** ⭐

FDOT Sample Number
⭐

Point Of Sampling
▾ ⭐

Sample Type
▾ ⭐

5. Aggregate Production Facility

Type in the Production Facility's code number here. MAC has a feature that is called the "Type Ahead Option". Once you have typed three characters, a list of all codes that start with these characters appear. You can click on the list to select a Facility as a short cut. This action populates the field. You can type the full five-figure alphanumeric code and the facility will appear below the box. Another option is to type in the company name. You must either click on the text below the box, or press the Enter key or the field will not get filled in. For example, if the text appears below the box and you click in another field the Production Facility field remains empty.

6. Product

A "Product" is the unique identifier that includes the Category, Production Facility and Process. If the Product is at a Redistribution Terminal, both the Mine and Terminal name are included in the unique Product identifier.

If a Production Facility has only one Process, then when the "Aggregate Production Facility" is selected MAC automatically fills in the "Product" field. If there are more than one Process, the Product field turns blue and a drop-down bar appears.

Click on the arrow to reveal the different Processes, place the pointer over the choice, and click to enter that Product.

7. Sampled by Tech
Enter the "Technician Identification Number (TIN)". You can also use the type ahead feature with the TIN, or the technician's first or last name to select from the drop-down list.

8. Date Sample Taken
This is the date the sample was collected, placed in a container and labeled. It is not a future date if the sample is not delivered to the lab on the same day. When the date sampled is the day that a sample is being logged in, press the Enter key to select "today's" date as a shortcut.

9. FDOT Sample Number
The "FDOT Sample number" is a six-digit numerical identifier in the format YYWW##.

- YY represents the last two digits of the year, for example 19 for 2019.
- WW represents the week number for the year. Weeks 1 to 9 are entered with a zero (0) in front so that that the week number always has two digits.
    - o Week one starts when January 1 falls on a Wednesday or earlier.
    - o In a week when January 1 falls on a Thursday or later, that week becomes week 53.
- ## represents the number of samples taken on a unique product each week in the order they were taken. Samples 1 to 9 are entered with a zero (0) in front so that that the sample number always has two digits. For example, two samples taken on a Monday for a Code 10, Process 1, will be 01 and 02.
    - o Sample numbers are not unique. The first samples at a Production Facility for C10, F21 and B01 will all be "01" (following the year and week)
    - o Do not skip a sample number. The first samples for C10 and F21 should not be "01" and "02". In this case, sample number "01" was skipped for F21
    - o Sample numbers should not be repeated in the same week. For example, Sample "11" comes after "10"

10. Point of Sampling
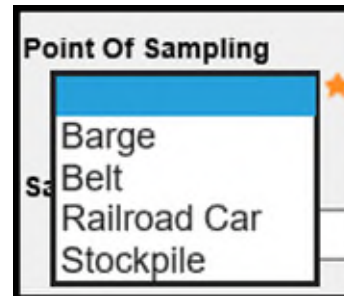
This is a drop-down box with the choices:

11. Sample Type
This field allows the user to further identify the purpose or location of the sample. A Production Facility can take a QC sample at the Point-of-Use Plant. However, the results are not part of the compliance package.

12. Testing Lab
This is the official lab number assigned to your Lab upon FDOT approval

13. Location
This an optional field. You may type anything you want. For example, "Sampled from west end of Stockpile #3".

14. Comment
This an optional field. You may type anything you want. For example, "FDOT Inspector was on site at time of sampling"

15. Document
This is an optional feature used to upload any document you want. For example, scanned written notes, electronic file or pictures.

16. Save, Save and Submit
These are two separate options. "**Save**" allows the user to complete the sample log-in, and then log in another sample if desired. Once all samples have been logged and Saved, it also allows the user to return to make changes to the mandatory Sample Information, and optional information. The Material Information cannot be changed. There is no need to change the Material Specification, because MAC would not allow the user to enter a Category that did not match the MAC Spec. Sample Level cannot be changed. Click the "Update Sample Info" link to the far right of the screen to perform this task.
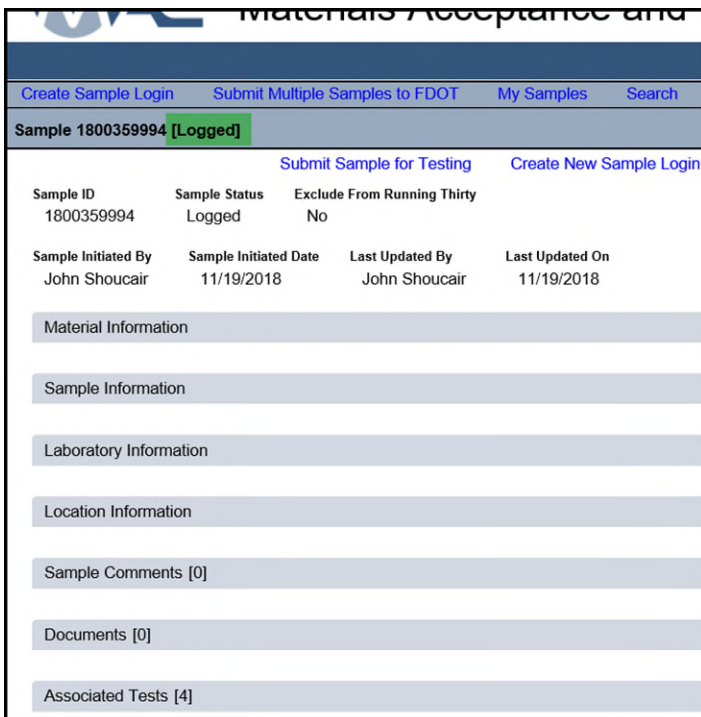
- o Save creates a unique Sample MAC ID, in this case, 18003599994, which is made up of 10 numeric characters. The first two characters are the last two digits of the year.

- o The Sample Status is "Logged". Note that some MAC information can be found in more than one location, e.g. MAC ID and Sample Status. In the

sample's life-cycle, the Production Facility is still in control of the data, i.e., the owner of the sample data.

o Save creates a summary page of subsequent actions for the user. These actions will be discussed later.

o Because the "Save and Submit" option was not used, there is still a link to "Submit Sample for Testing". This is required to enter data for test results. Either "Save and Submit" or "Submit Sample for Testing", immediately sends the sample's log-in information to the lab to begin the Sample Test Cycle. This completes the Sample Login process.
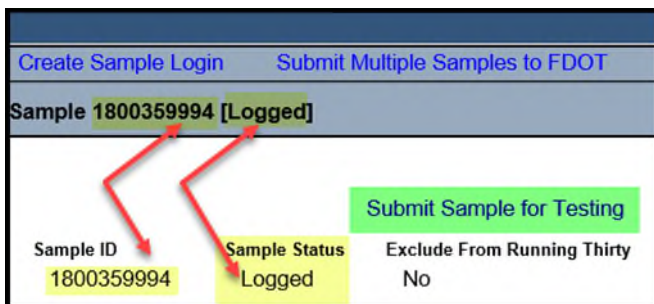
o Any of the grey bars can be clicked, in any location to reveal the information that is currently hidden. Clicking the bar again, collapses the bar and hides the information from view.

Chapter 2   Perform Tests Submitted

At this point the Material Information and Sample Information requirements are complete. The following steps are required to perform tests. These directions are for a single sample. A discussion of multiple samples will be presented later.

A. Laboratory Information

1. Sample Submitted
When the sample is submitted the Sample Status changes to "Submitted for Lab Testing"
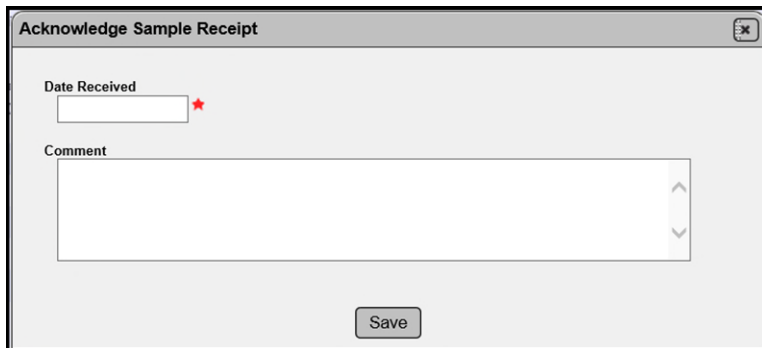

2. Laboratory Actions
The sample is now in the possession of the lab. Click on the "Laboratory Information" bar. Note that the Lab Status is "Waiting on Receipt". For Aggregates,

the only step needed is to click on the link "Acknowledge Sample Receipt"

3. Date Received

A new screen opens and the "Date Received" is a required entry. The "Comment" is optional.

Click in the Date field. This is the date the sample is received in the Lab.

Either click a date on the calendar, or press the "Enter" key to select today's date.

4. Laboratory Receipt

After clicking "Save", the Laboratory status is "Received". The Sample Status is still "Submitted for Lab Testing". Note that if an error was made, it can be corrected by clicking on the link "Update Received Date"

B. Performing Tests

1. Associated Tests (the instructions will discuss the numbered links below)

Each MAC Product has "Associated Tests" that are the normal lab tests. These are default tests and can be found by clicking the bottom bar of the screen.
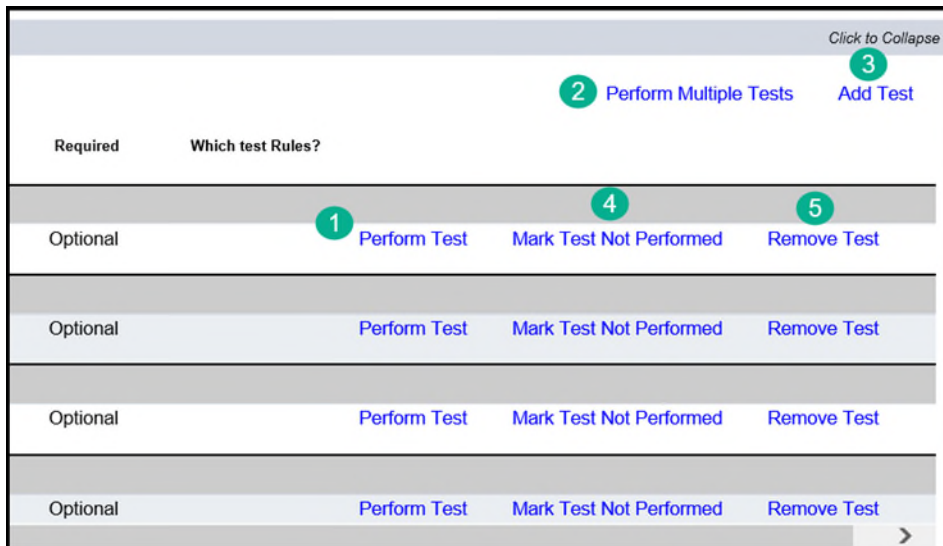

In the example below, four Lab tests for Coarse Aggregate are listed. The Test Status is "Ready for Testing". Note that the test result entry can be started by clicking the "Perform Test" link for one test at a time, or for all by clicking the link "Perform Multiple Tests".

For these instructions, this figure shows the left side of the screen and the next figure shows the right side of the screen. This helps to make the display more readable.
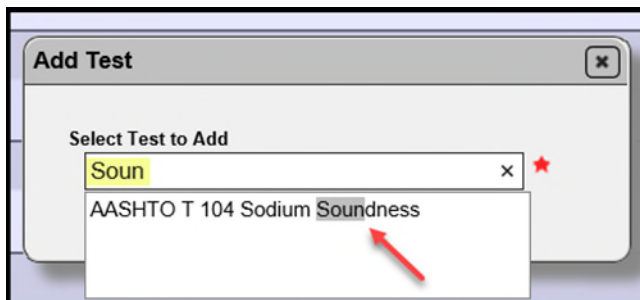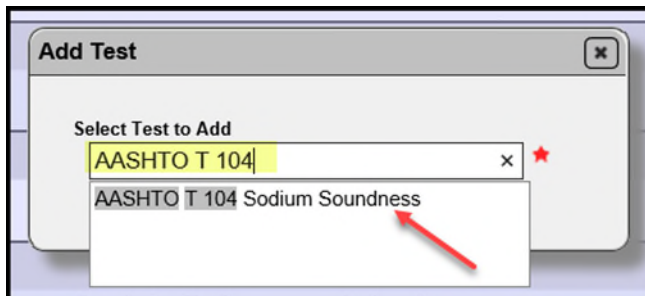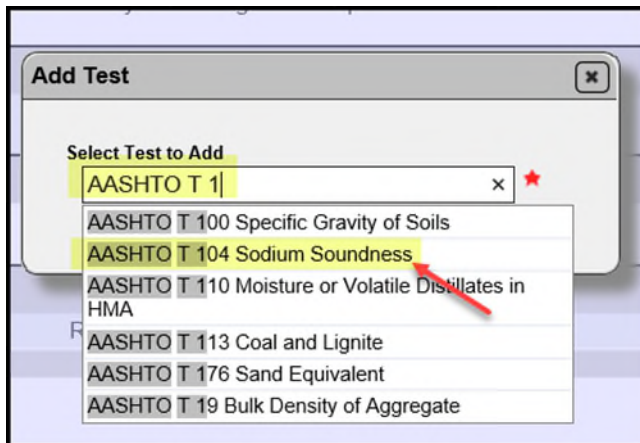
2. Selecting Tests

Note that there are several features with MAC links for entering data. test result entry can be started by clicking the "Perform Test" link for one test at a time, or:

Test result entry can be started for a single Test by clicking ❶ "Perform Test".

Test result entry can be started for all Tests by clicking ❷ "Perform Multiple Tests".

If a Test needs to be performed, but was not one of the default tests it can be added by click ❸ "Add Test". You can use the type-ahead feature and you **must** click on the Test name once you recognize it in the drop-down list. See the next figure. If the press the Enter key but do not click the test name, the field remains blank. Another option is to type the entire Test name and the click on the Test name. Another option is to type any portion of the Test name, in any order inside the name, and click on the correct Test once you recognize it in the drop-down list.

Add Test

Select Test to Add

AASHTO T 1

- AASHTO T 100 Specific Gravity of Soils
- AASHTO T 104 Sodium Soundness
- AASHTO T 110 Moisture or Volatile Distillates in HMA
- AASHTO T 113 Coal and Lignite
- AASHTO T 176 Sand Equivalent
- AASHTO T 19 Bulk Density of Aggregate

Add Test

Select Test to Add

AASHTO T 104

- AASHTO T 104 Sodium Soundness

Add Test

Select Test to Add

Soun

- AASHTO T 104 Sodium Soundness

Note that MAC loads common default Aggregate Tests with an Optional description. This does not mean that a lab can ignore required Tests. However, if a L.A. Abrasion Test is not required, the user can submit the sample results for Aggregate Gradation, Total Minus 200, and Specific Gravity, without a need to remove the L.A. Abrasion Test. If there is a specific reason why the Test **cannot** be performed click ④ "Mark Test Not Performed" and document the circumstance.
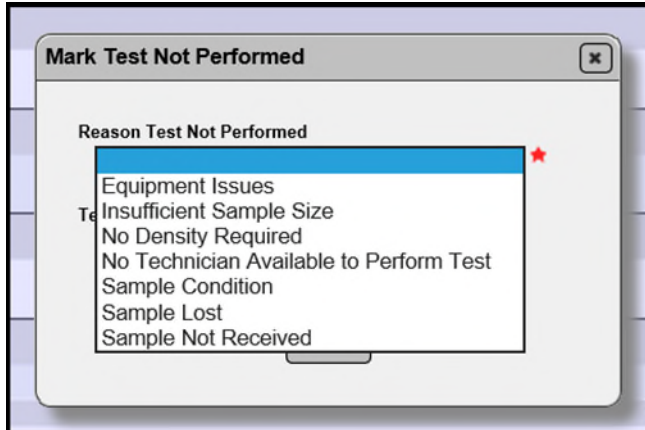
If the user would like to remove a test, click the link ⑤ "Remove Test". No Reason is required. This feature can be used to clarify the list of needed tests for the Laboratory Technician.

3. Begin Test Entry
When the link "Perform Test" is clicked, a worksheet opens with all required entries for the test method. MAC has added features to simplify data entry, which will be discussed later. You can also click Perform Multiple Tests" which will open the worksheets for all test to be visible. A user with a Data Entry or Data Reviewer role is required. The following example is shown for FM 1-T 011

All fields should be entered as directed by the test method. The MAC screen allows an option to simplify data entry. Select Yes or No for "Is this combined FM 1-T 011 and AASHTO T 27 Test?" Select Yes if a single sample is used to run both tests. This will add fields to the screes for FM 1-T 011 and auto populate fields in AASHTO T 27 Aggregate Gradation. Always enter the FM 1-T 011 test data first.

4. Errors/Warnings

MAC flags some data entry as ERRORS or WARNINGS. For example, the minimum start mass for a C10 in FM 1-T 011 is 5,000 g. If you enter anything less MAC flags an ERROR in red type. In this case, more aggregate must be properly split out, and added to the test sample, or a new sample collected.

Is this combined FM 1-T 011 and AASHTO T 27 Test?	No ▾
Mass Before Wash (g)	2,300.0
	ERROR: Sample Mass is less than Minimum Required Sample Mass

If a typo is made, for example, entering a "Mass After Wash" that is larger than "Mass Before Wash", MAC flags a Warning

Mass Before Wash (g)	5,126.0
Mass After Wash (g)	5,187.0
	Warning: Mass After Wash cannot be greater than Mass Before Wash. Please update the Mass After Wash value.
Mass Loss After Wash (g)	-61.0

In this case, Warning reminds you that the correct value can be re-entered.

5. Save

A test can be saved at any point by clicking the "Save" button. If all the required fields are not entered, "Save" creates a Test **Status** of "Testing in Progress". When all are completed, "Save" creates a Test **Disposition** on the "Associated Tests" screen of Pass or Fail. The Test Status becomes "Test Complete". Note the difference between "Status" and "Disposition". "Disposition" implies that the testing is completed.

6. Test Disposition

As noted above, a Test Disposition can be Pass or Fail. The lab's Data reviewer should ensure that all tests were performed correctly. All tests, whether passing or failing must be submitted to FDOT.

7. Specification failure

Specification failures are programmed in the MAC Test and will flag when the data is entered.

Mass Loss After Wash (g)	116.0	
Mass in Pan (g)	2.0	
Total Percent of Minus 200 (%)	2.30	Does not meet target/limit [Total Percent of Minus 200 <= 1.75]

8. General Errors

MAC is programmed with other flags as previously noted. These flags appear when values entered for Masses required by Test Methods, etc. or typos resulting in negative values are computed. A Star next to a field means that field is mandatory.

9. Submit to FDOT

When "Submit to FDOT" is selected, the Production Facility is no longer in control of the data, i.e., the owner of the sample data is now the FDOT. The Sample Lifecycle is now Finalized.
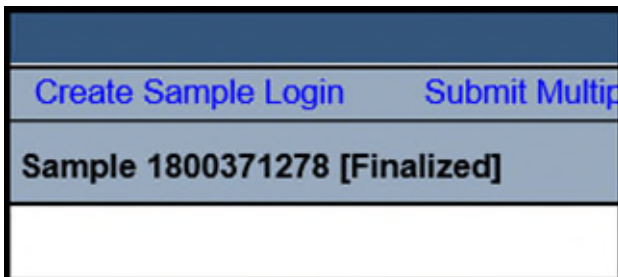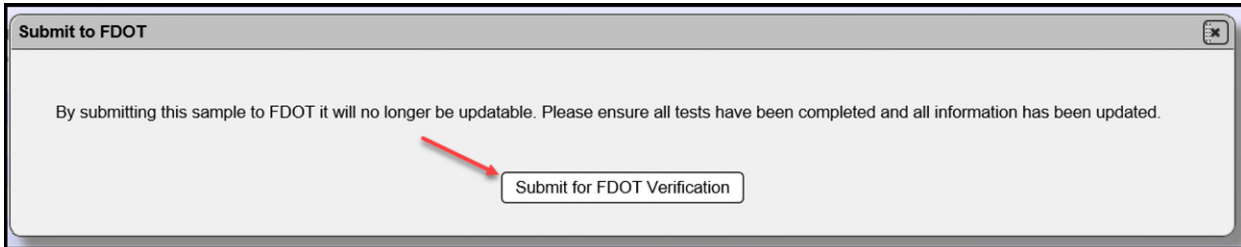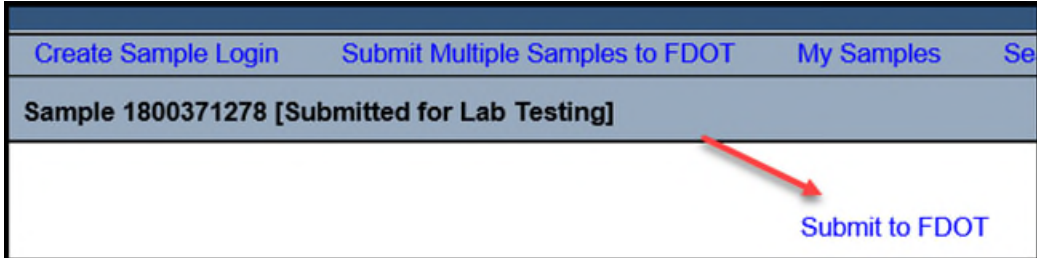
10. Technical Help after Submittal

If any error occurs or if there are any questions, email "SM-Aggregates" for help.