



Florida Department of
TRANSPORTATION



**Structural Concrete Sample
Guide**

May 19, 2021

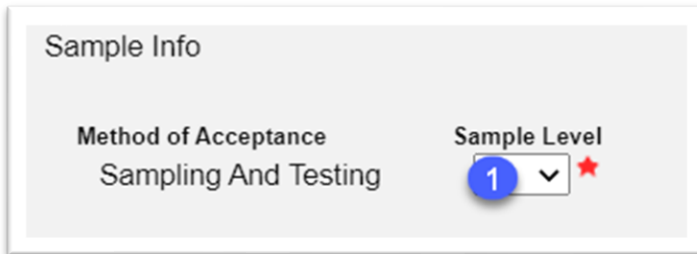


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Chapter 1 - Structural Concrete Sample Login

The [MAC Project Sample User Manual](#) shows concrete examples for each stage of the sample life cycle. This document will provide details for concrete samples that were not included in the manual. The descriptions begin after creating a sample and selecting the Continue to Sample Info option.



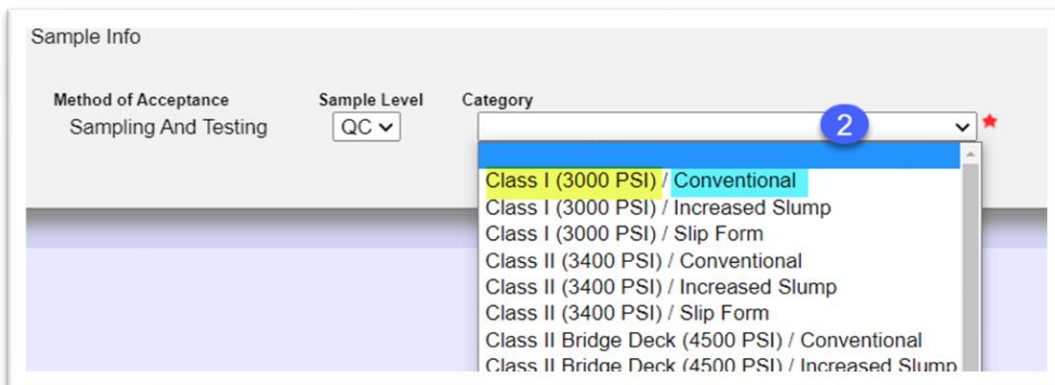
Sample Info

Method of Acceptance
Sampling And Testing

Sample Level
1

1. **Sample Level** – select the appropriate Sample Level to reveal more fields.

The next field that will appear is Category. This is a combination of **category** and **type** for MAC Specs that have categories and types. For MAC Spec 346 and 350, the categories are the classes of concrete and the types are the different applications. Class I (3000 PSI) / Slip Form is a Class I concrete that has adjustments made to the slump so it can be placed in a slip form operation. The Category is Class I (3000 PSI) and the Type is Slip Form. It's differentiated this way because normal Class I Concrete with a type of Conventional has a different slump than slip form Class I concrete.



Sample Info

Method of Acceptance
Sampling And Testing

Sample Level
QC

Category
Class I (3000 PSI) / Conventional
Class I (3000 PSI) / Increased Slump
Class I (3000 PSI) / Slip Form
Class II (3400 PSI) / Conventional
Class II (3400 PSI) / Increased Slump
Class II (3400 PSI) / Slip Form
Class II Bridge Deck (4500 PSI) / Conventional
Class II Bridge Deck (4500 PSI) / Increased Slump

2. **Category** – select the appropriate category / type combination.

NOTE: There are different requirements for each category and type. This selection determines the tests assigned to the sample and the limits for pass/fail assigned to each test. The example data is for Class IV/Conventional. If Class VI was selected, the limit for ASTM C39 would be 8,500 psi and a result of 7,440 would show as a failure (based on Class VI) when it really passes (based on Class IV). If a higher strength is used in lieu of a lower strength, there is an indicator that will appear later where you can record that. For structural concrete, the category/type should match the mix design category/type except when Class I is used for concrete pavement.

Additional fields will appear when the category/type is selected. Because a production facility is required on a structural concrete sample, the next field to display is Structural Concrete Production Facility. Since one hasn't been selected yet, there is a message to select a production facility to get the mix design field. The structural concrete production facility and mix designs should be entered, reviewed, and approved on the Contractor QC Plan before structural concrete is placed and samples are taken. The programming looks at the production facility number you enter to see if it is on the Contractor QC Plan and then presents a list of suitable mix designs on the Contractor QC Plan for that production facility.

This screenshot shows a form with the following fields:

- Method of Acceptance: Sampling And Testing
- Sample Level: QC (dropdown)
- Category: Class II Bridge Deck (4500 PSI) / Conventional (dropdown)
- Structural Concrete Production Facility: Type Production Facility Name (text input, highlighted with a blue circle and the number 3)

3. Structural Concrete Production Facility – enter the production facility number or all or part of the production facility description in the Structural Concrete Production Facility field.

Now that a production facility has been selected, the mix design field displays. It first filters on the Contractor QC Plan entries for the selected production facility.

This screenshot shows the form with an additional field:

- Mix Design: Type Mix Design Name (text input, highlighted with a blue circle and the number 4)
- Allow any Approved Mix Design: (checkbox)

4. Mix Design – enter all or part of the FDOT mix design number and select the entry from the returned list.

In case of emergency, there may be a need to place a mix design that has not yet been assigned on the Contractor QC Plan, reviewed by the QC PMU and accepted by the PA. This should be a rare occurrence and not routine.

This screenshot shows the form with the checkbox selected:

- Allow any Approved Mix Design: (checkbox, highlighted with a blue circle and the number 5)

5. Allow any Approved Mix Design – select this check box when a mix design that is not listed on the Contractor QC Plan is delivered and placed. The Mix Design field is still displayed, except now the selections are not restricted to the mix designs under the production facility on the Contractor QC Plan. They are restricted to the mix designs of the company of the production facility. Enter the mix design number in field #4.

WARNING: This is an Offlist Production Facility. Production Facility 01-1802-05 is not listed on the QCP for this contract. *
WARNING: This is an Offlist Mix Design. Mix Design 02-1802-05 is not listed on the QCP for this contract. *

NOTE: If a sample is saved or submitted with a production facility or mix design (or both) that is not listed on the Contractor QC Plan, the system will flag the sample with an off-list flag. If you click on the highlighted production facility id or mix design number, a pop-up window will appear with additional information. These findings are not part of the Materials Certification (MC) Review and are not sent to MC Review as findings. The project personnel should coordinate with the QC Manager to ensure the Contractor QC Plan is being updated as required by Specifications Section 105.

Sample Level	Category	Structural Concrete Production Facility	Mix Design	Allow any Approved Mix Design	Mix Design Category
C	Class II Bridge Deck (4500 PSI) / Conventional	01-1802-05 *	02-1802-05	No	Class II Bridge Deck (4500 PSI) / Conventional
Taken	Production Facility 01-1802-05 is not Approved/Accepted				

NOTE: If the Producer QC Plan status of the production facility is not Accepted at the time the sample is taken, the production facility will be flagged on the sample as unqualified after the sample is saved or submitted. This flag is a finding for MC Review and will most likely result in an Exception to the Project Materials Certification Letter (PMCL). Since it is a warning flag, not an error, you will be able to proceed with the sample data entry. This is not the same as an off-list flag.

Sample Info

Method of Acceptance	Sample Level	Category	Structural Concrete Production Facility
Sampling And Testing	QC	Class II Bridge Deck (4500 PSI) / Conventional	01-1802-05 *
Mix Design	Allow any Approved Mix Design	Mix Design Category	
01-1802-05 *	<input checked="" type="checkbox"/>	Class I (3000 PSI) / Conventional	

NOTE: MAC will display the category and type on the mix design so you can see what it mismatched.

You will also receive a warning message.

WARNING: The Mix Design is for a different category [Class I (3000 PSI) / Conventional] than the sample [Class II Bridge Deck (4500 PSI) / Conventional] *

Acknowledge the warning message(s) by selecting the x next to the message(s). Go back to the Category/Type field and fix the mismatch.

Mix Design: 0 [star]

Allow any Approved Mix Design:

Mix Design Category: Class II Bridge Deck (4500 PSI) / Conventional

Sampled By Tech: Type Technician Name or TIN [6] [star]

Date Sample Taken: [7] [star]

Higher Class in Lieu of Lower Class: [8]

6. **Sampled By Tech** – enter the name or TIN of the technician who took the sample. Structural concrete samples must be sampled by a Technician who is qualified in Concrete Field Level 1 at the time the sample is taken (field #8).

NOTE: The technician must have at least one qualification to appear on the list. If the person who took the sample is not qualified in anything (doesn't have a TIN), the sample cannot be used for acceptance and must be discarded. A new sample must be taken by a qualified person. This does **NOT** mean that the person must be qualified in Concrete Field Level 1. If the person has a TIN in CTQP, the sample will accept the entry, then check to see if the person is qualified in Concrete Field Level 1 on the date the sample was taken. If the person is not qualified in the appropriate qualification area at the time the sample was taken, the sample will be flagged with an unqualified TIN message.

7. **Date Sample Taken** – enter the date the sample was taken or select it from the calendar.

8. **Higher Class in Lieu of Lower Class** – if the mix design on the sample is a higher class of concrete that is being used in lieu of a lower class, select this checkbox.

A new field will appear that will allow you to select the lower class.

Higher Class in Lieu of Lower Class:

Lower Class: [9] [star]

9. **Lower Class** – select the appropriate entry from the list. Make sure it is a lower class. In this example data, the mix design is Class IV Conventional. Any entry including and above Class IV Conventional would not be appropriate.

FDOT Sample # (CC40001Q): [10] [star]

Quantity Represented: [11] [star]

Unit of Measure: Start type [12] code value [star]

Batch/Delivery Ticket #: [13]

LOT #: [14] [star]

Intended Use: [15]

10. **FDOT Sample #** – enter the FDOT Sample #. Some materials have a sample numbering system. Others do not and any sample numbering system can be used.

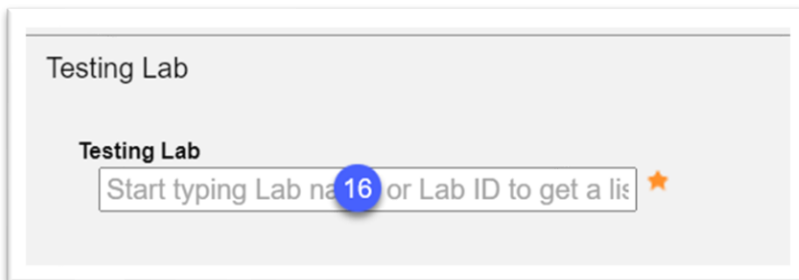
11. **Quantity Represented** – enter the quantity that sample represents in the Quantity represented field. For example, if the sample quantity represented is 50 cubic yards, enter 50.

12. **Unit of Measure** – enter the unit of measure that sample represents in the Quantity represented field. For example, if the sample quantity represented is 50 cubic yards, enter Cubic Yard(s).

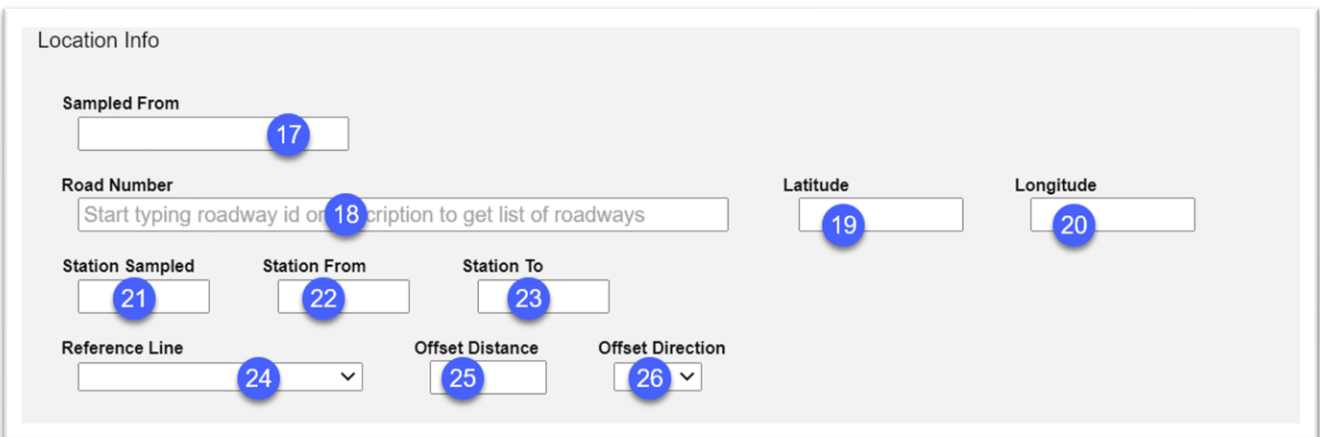
13. **Delivery Ticket** – enter the delivery ticket number in the Batch/Delivery Ticket # field. This field is optional. It is useful for reporting purposes for the production facility that produced the concrete.

14. **Lot #** – enter the Lot #.

15. **Intended Use** – enter the intended use, if desired. The field is optional.



16. **Testing Lab** – enter either the lab facility id or all or part of the lab description. Select the appropriate entry from the returned list.



17. **Sampled From** – enter information regarding where the sample was taken, for example stockpile or truck mixer, in the Sampled From field.

18. **Road Number** – enter the Roadway Characteristics Inventory (RCI) Roadway Id. It can be found on the project key sheet:



19. **Latitude** – enter the latitude location where the sample was taken in the Latitude field. This field is used in conjunction with the Longitude field to pinpoint the exact sample location.

20. **Longitude** – enter the longitude location where the sample was taken in the Longitude field. This field is used in conjunction with the Latitude field to pinpoint the exact sample location.

21. **Station Sampled** – enter the station where the sample was taken in the Station Sampled field.

22. **Station From** – enter the beginning station location of the area represented by the sample in the Station From field.

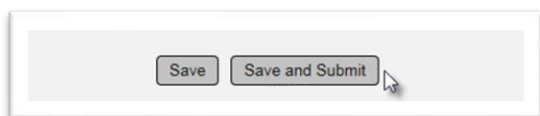
23. **Station To** – enter the ending station location of the area represented by the sample in the Station To field.

24. **Reference Line** – select the controlling line of the project as shown in the plans. If the option used is not listed on the dropdown list, make a comment in the comments section describing the reference line. Make sure it is a valid survey line that can be relocated if needed.

25. **Offset Distance** – enter the offset distance in feet.

26. **Offset Direction** – select the offset direction from the Reference Lin in the dropdown list.

The Contact Information is required for structural concrete samples because the cylinders are lab samples. Add comments and documents if desired. These fields are described in the [MAC Project Sample User Manual](#).



36. **Save & Submit** – select Save if you are not ready send the sample for testing and want to save the data you have entered so far. Select Submit if you are ready to send the sample for testing (lab samples) or to enter test results (field samples). If you select Save, the sample will be designated as Logged and will need to be Submitted for Testing in order for the test results to be entered on the lab tests.

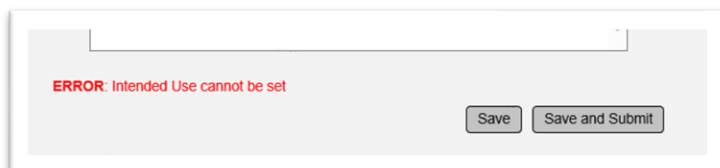
Chapter 2 – Creating a New Sample from an Existing Sample

A handy feature in MAC is the ability to create a new sample from an existing sample record. This can be used for any sample that your company has custody of and is especially helpful for samples like the resolution cylinders for structural concrete. The QC data entry person can use the QC sample to create the QR sample and the VT data entry person can use the VT sample to create the VR sample.

A. Issues with Creating a Sample from another Sample

Before you attempt to create a sample from another sample, there are a few things you need to be aware of when using this function.

1. You cannot create a sample from a sample that was not created by a user in your company. For example, a user in the FDOT company profile of District 4 cannot create a sample from a sample that was created by a user in the FDOT company profile of District 5.
2. Sometimes when you create a sample from a sample in a different MAC Spec category, type, sample purpose or sample level, you will receive an error message about not being able to update certain fields.



This means that the original sample has a required field, and the copied sample does not have the field. In this example, the original sample had Intended Use as a required field. The sample being created is a different category/ type and the Intended Use is not on the new sample's login screen, so MAC has no place to populate the required data from the old sample to the new sample. If you see this error message, you should create the new sample from a sample that is the same category / type or create the sample from scratch.

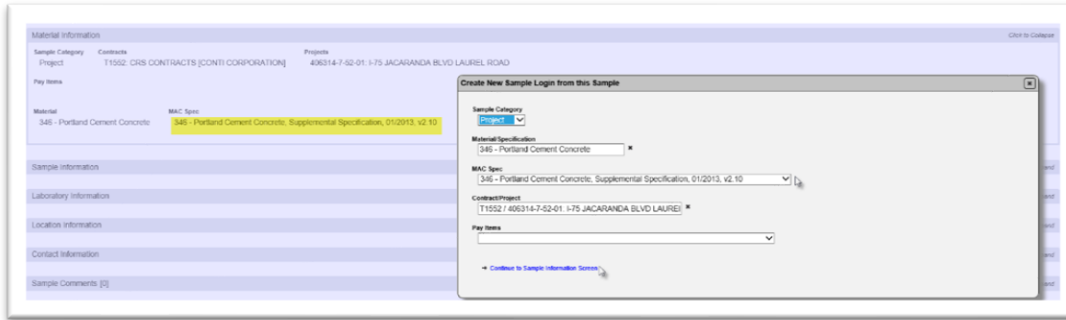
B. Creating a Sample from another Sample

NOTE: It is helpful to click on the Materials tab to expand it on the sample being copied if the new sample has the same MAC Spec as the copied sample. Do this before you perform the next steps.



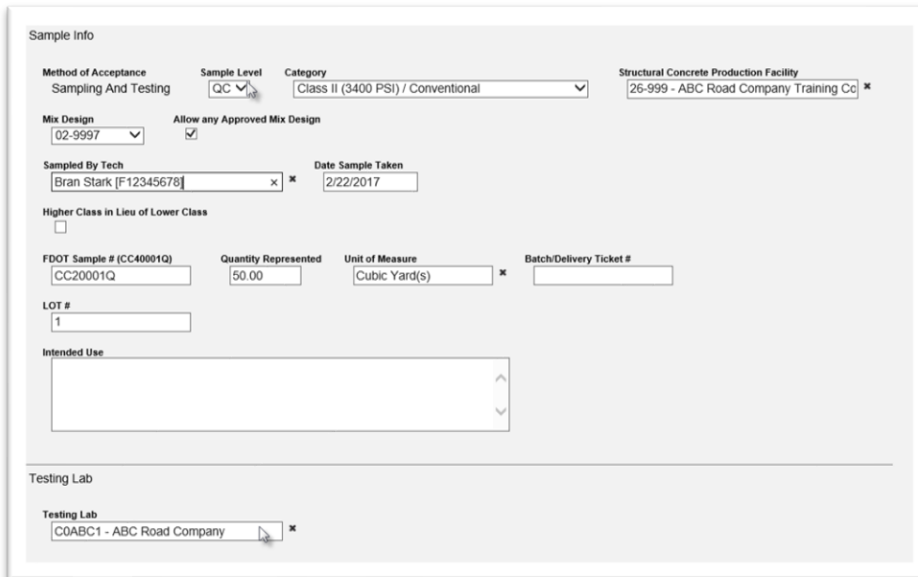
1. On the sample you wish to copy from, select the Create New Sample Login from this Sample option.

A Create New Sample Login from this Sample dialog box will appear.



2. Because the header information for the new sample may be different, you will need to select the MAC Spec for the new sample.
3. Make any other changes as needed.
4. Select the Continue to Sample Information Screen option.

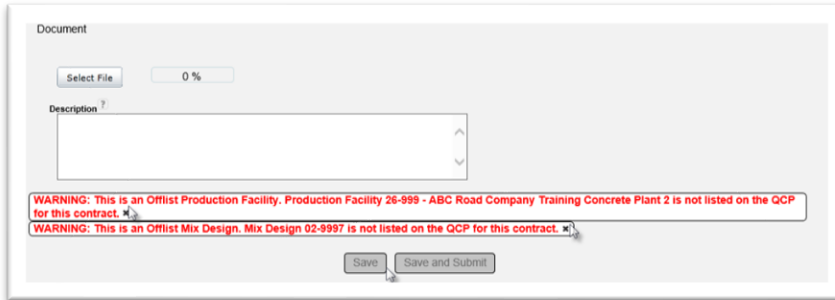
The Create New Sample Login from this Sample dialog box will expand. It will be populated with the Sample Info, Testing Lab, Location Info and Contact Info from the original sample.



5. Make changes to the sample information as needed. For example, if you are using the QC structural concrete sample to create the QR sample because the QC and VT did not compare and now Resolution samples need to be entered and tested:
 - a. Change the Sample level from QC to QR.
 - b. Change the FDOT Sample Number from CXX000XQ to CXX000XQR.
 - c. Change the Testing Lab from the QC lab to the Resolution lab.

All other information, date sample taken, Lot number, Category / Type, Mix Design, Production Facility should remain the same. If the contact person needs to be updated, make those changes as well.

Any warnings created by this data will be shown at the bottom of the dialog box.



The screenshot shows a dialog box titled "Document". At the top left, there is a "Select File" button and a progress indicator showing "0%". Below this is a "Description" field with a question mark icon and a scrollable text area. At the bottom of the dialog, there are two warning messages in red text, each with a small 'X' icon to its right. The first warning reads: "WARNING: This is an Offlist Production Facility. Production Facility 26-999 - ABC Road Company Training Concrete Plant 2 is not listed on the QCP for this contract." The second warning reads: "WARNING: This is an Offlist Mix Design. Mix Design 02-9997 is not listed on the QCP for this contract." At the very bottom of the dialog, there are two buttons: "Save" and "Save and Submit".

6. Read the warning messages, then click on X on the warning messages to acknowledge them. You may need to make changes to the data if the warning message is due to a data entry error.

7. Select Save or Save and submit.

Chapter 3 – Sample Receipt

Structural concrete samples are not auto-receipt. The laboratory performing the compressive strength test must indicate they have taken custody of the concrete cylinders by receiving the sample in MAC before they can enter the compressive strength test results. Sample Receipt is the same as described in the [MAC Project Sample User Manual](#).

Chapter 4 – Result Entry & Submit Sample to FDOT

Result Entry

The plastic properties test results can be entered by the field data entry personnel as soon as sample is saved or submitted.

The compressive strength results can be entered after the sample is received. The lab test result entry is independent of the field test result entry. The test allows for entry of 1, 2 or 3 cylinders. Typically, there will be 3 cylinders. Resolution Testing is done on 1 cylinder. If any of the cylinders were lost, make a note of the lost cylinder(s) in the test notes.

Submit Sample to FDOT for Verification

A Data Reviewer for the company of the lab testing the sample must review the test information and confirm it as correct and complete before the sample can be finalized by the PA. By submitting the sample to FDOT for Verification, the Data Reviewer is acknowledging that the data has been reviewed and is ready for finalization. The sample cannot be submitted to FDOT for Verification by the company inputting the field test results. The company of the laboratory CAN submit the sample to FDOT for Verification if the field test results are not entered. If field test results are not entered, contact the Sample Contact before submitting the sample to FDOT for Verification. The field tests may not have been performed or they may have been and the data entry personnel forgot to enter the results.

Chapter 5 – PA/FDOT Verifier Sample Finalization & Comparison Packages

PA/FDOT Verifier Sample Finalization

Structural concrete samples are not eligible for multi-finalization. The PA (for project samples) or the FDOT Verifier (for program samples) must review the sample information using the MAC Concrete Finalization guide list. **Do not send samples back for revisions if a key field is incorrect.**

Comparison Packages

The PA or FDOT Verifier creates comparison packages for structural concrete samples after they are finalized. The comparison package consists of an original sample (QC), a verification sample (VT) and may include up to 3 associated QC samples. The search criteria for structural concrete samples is MAC Spec, Contract or Financial Project Id and mix design. The system will warn the user if a comparison package includes samples with different mix designs.

A comparison package should be created as soon as the original sample and the verification sample are finalized. Do not wait for all associated samples for structural concrete comparison packages. Since Resolution must be initiated when there is a non-comparison, the comparison package should be created as soon as the comparison can be performed so a status of Compares or Does not Compare is assigned. That way the PA will know if Resolution should be initiated.

Resolution

When a comparison package reveals that the QC and VT samples do not compare, the PA should initiate Resolution within the time frame specified in Section 346. This consists of:

- Notifying QC to log the QC Hold cylinder in as sample level QR and send it to the Resolution Lab
- Notifying VT to log the VT Hold cylinder in as sample level VR and send it to the Resolution Lab
- Finalizing the QR and VR cylinders when the Resolution Lab submits them for FDOT Verification
- Adding the QR and VR cylinders to the comparison package
Selecting the Manual Final Resolution Status on based on the DMRO Concrete personnel recommendation

If resolution cannot be performed, the PA should indicate that Resolution was not Performed and select the appropriate reason. Until the Final Resolution status is selected, or the comparison package is designated as Resolution Not Performed, all samples in the comparison package are open samples.

Incomplete Packages

If a comparison cannot be performed because the original or verification sample is missing or both are missing, the PA should create an incomplete package and select a reason why comparison could not be performed. Until the samples are included in a comparison package, they are open samples.