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Earthwork Records System - ERS

1. What is ERS?

The term Earthwork Records System or ERS is used to describe the documents used to record the material acceptance for earthwork construction operations. It includes paper density logbooks and electronic records in the Materials Acceptance and Certification system (MAC).

2. Why is FDOT going to electronic ERS?

The use of MAC to record earthwork acceptance has many advantages. It saves paper and long term storage of paper logbooks. It allows for reporting acceptance data in the Department's enterprise application. It improves the tracking of active earthwork technicians for the Independent Assurance Program. By having the data in MAC, it eliminates much of the manual recording and reporting needed in the paper logbooks, for example, the list of proctor samples and testing technicians.

3. When will this happen?

The programming has already been added in the MAC production environment. The MAC Specs that govern the ERS projects and samples are set to be implemented on contracts let on or after October 1, 2021.

4. What is an ERS Project?

An ERS project is the main entry for a Financial Project Number that includes as many logbooks as the project requires. It is created by a user with the system role of Program Maintenance User (PMU), then data entry personnel from the company or companies designated as QC on the ERS Project can create plots.

5. Does the Company Profile Manager need to do anything for ERS?

Company profile managers maintain the list of company nuclear gauges used in earthwork acceptance on the company profile. They also add calibration data for each gauge.

6. My job was let before October 2021, and we have a paper logbook. Do I have to convert to an ERS Project in MAC?

No. Projects that have an existing paper density logbook will not be required to convert to a MAC ERS Project. They will continue with the paper logbook until the project earthwork is complete. Contractors may request to convert if they wish, but do not have to.

7. I'm a QC Manager. My project was let in September 2021 and earthwork hasn't started yet. Can I use MAC ERS instead of a paper logbook?

Yes. Let the PA and District Materials Office Earthwork personnel know that you want to use an ERS project, and the assignments can be made in MAC to allow it.

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8. What is the difference between a user and a technician?

A technician is a person holding a specific qualification or certification and is normally identified with a Technician Identification Number (or TIN). A user is someone with an access account, either and FDOT User Id or an Internet Subscriber Account (ISA) that has been assigned company and/or system roles in MAC. Some people have both. With the implementation of ERS, many technicians will need to request access so they will be able to record ERS tests in MAC directly.

9. What will a technician who is also a user need to enter results in the field?

The user will need a device that can connect to the Internet and the Internet connection. It doesn't have to be a laptop. Many tablets can also be used. It is up to each company to determine the most appropriate equipment. They will also need an access account and MAC roles.

10. Speaking of Internet connectivity, what if I'm on a project with no internet access?

This has been designated as a remote project for ERS. Contractors who believe they are on a remote project should contact the District Materials Office Earthwork personnel who will travel to the project location and confirm whether the internet can be accessed. If there is no coverage, even with devices and hotspots or other boosters, the Contractor will be granted the remote contract process. You still need an ERS project in MAC, but the daily tests will be recorded on FDOT forms and entered the next day.

11. What if I'm not on a remote project and MAC is not available?

The Department recognizes that situations occur, and MAC availability is impacted. This would affect all MAC users, not just ERS. When MAC is temporarily unavailable, non-remote projects will be permitted to record daily tests on FDOT forms and enter the results when the system becomes available again.

12. I have a tablet and an internet connection, but my tablet doesn't have a mouse. Can I still create a sample on the ERS screen?

Yes. Many tablets have touch screens. If your device has a touch screen and you are in the correct roles, you should be able to touch the screen at the test location to create the sample and MAC will record the station and elevation, just as it would with a user with a mouse. If you don't have that, you can use the Create Sample option. In that case, you'd need to supply the station and elevation, but everything else on the sample and test is the same.

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Training

1. I keep hearing about the ERS implementation, but I don't see anything about training. How do I get trained?

Since the ERS implementation is project based, each District Materials Office will be providing hands on end user training as projects are identified with earthwork let on or after October 1, 2021. The training will be provided to the project ERS users before the earthwork operations begin. As each month has new projects starting, those project teams will be trained if they have not already received training. By using this just in time approach, it ensures the information is current and fresh. It wouldn't be advantageous to receive training in October if you are part of a project team that will not have any earthwork operations beginning until March 2022.

2. I have an upcoming project and I haven't been contacted for training. What do I do?

Contact the District Materials Office Earthwork section and let them know your project number and when earthwork operations are scheduled to begin. The District Materials Offices are tracking lettings, but schedules can change so let them know if your project is starting soon and you need training.

3. Are there any training documentation available?

Yes, on this same website where you found these FAQs ([SMO MAC Website](#)), there is a section for all ERS related information. It contains detailed user manuals and short training videos for each subject area; company gauge maintenance, plots, sample life cycle and PA ERS functions.

Roles

1. What roles are needed for ERS?

There are several company and system roles needed. Below is a summary of the primary user who performs an ERS function. In some cases, other users may also have that ability, but the only the primary user is identified in the table.

ERS Function	Role	Company or System?
Create ERS Project & assign companies	Program Maintenance User	System
Create and maintain plots	Data Entry of the QC Company	Company
Mark Ready for Sampling	Data Entry of the QC Company	Company
Review Plots	Project Administrator	System
Maintain Project gauges	Data Entry for each company	Company
Create and maintain gauge comparisons	Project Administrator	System
Create samples, enter test results	Data Entry for each company	Company
Return samples for corrections, finalize samples, create comparison packages	Project Administrator	System
Process samples to pending finalization, correct returned samples,	Data Reviewer for each company	Company
Enter VT Witnessed by TIN	Data Reviewer for Witnessed By company	Company
Create Manual Findings related to ERS	Project Administrator User, Project Administrator	System
Respond to Findings	Project Administrator	System
Resolve Findings	Project Administrator	System

Plots

1. Will plots be automated in MAC?

No, not at this time. The State Materials Office and Central Office Design Office are working together to identify the data from the design files needed for automation and a way for MAC to use the data file. Future enhancements will allow for automation.

2. Who creates the plots?

A data entry person for the company designated as QC on the ERS project. If there is more than one QC company, the companies should coordinate who will be responsible for the plots. For example, QC Company A will enter the information for the Left Roadway and QC Company B will enter the information for the Drainage.

3. Are the plots required to be reviewed?

Yes, by a person in the role of Project Administrator. The QC data entry will designate a logbook as Ready for Sampling. Before the sampling begins, a PA will review the data entered to create the plots and if the review is not successful, they will mark the logbook as Not Ready for Sampling and make comments on the issues found. If the review is successful, they will leave the logbook designated as Ready for Sampling and notify the QC Manager.

4. Once they are reviewed, can plots be updated?

Yes, updates can be made to any of the data even after the logbook is designated as Ready for Sampling. MAC tracks changes made to the plot data after a logbook is set to Ready for Sampling and can notify ERS Project users when changes are made.

5. How many logbooks can an ERS Project have?

There is no limit to the number of logbooks an ERS project can have. If more than one of the same type of logbook is used; for example, two Left Roadway logbooks, the name field becomes a required field.

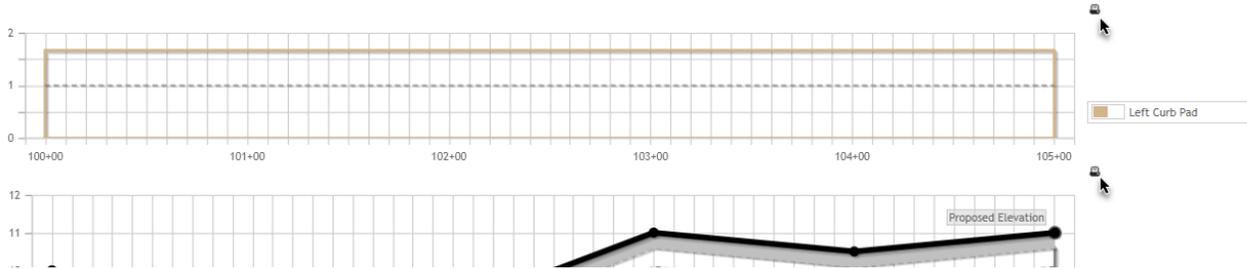
6. Are there any other restrictions for logbooks?

A single logbook cannot exceed 10,000 linear feet. If there is a break in the stationing on the project, you will need a logbook for each station range so that MAC does not identify densities where there are none.

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7. Back to Remote Contracts, since we have to still create the plots in MAC, can I get a printout of the plots for the field personnel to reference when testing and recording the data?

Yes. There is a print plot icon on every plot. Pads will need to be printed separate from the ESB plot. Use the MAC filtering feature to limit the printout to the areas being currently constructed.



8. If the roadway plots are complete, verified and Marked Ready for Sampling what do we do when the Contractor changes his mind and elects to place “LR in lieu of” after the plots were set up for full depth Stabilizing?

At any point in time, you can check ‘base in lieu of subgrade’ box by updating the LOT on a LOT by LOT basis under the LOTs tab. The QC Data Entry needs to remember to revise the stabilizing depth from the default of 12” to 6”. The PA should confirm that this has been done.

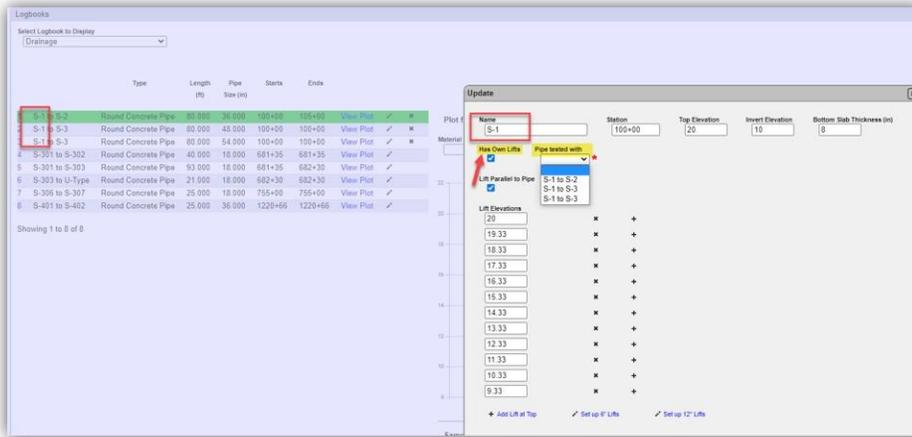


Drainage PLOTS

1. We have a drainage structure that is functioning as a “junction box” with multiple pipes tying into the structure. How will MAC allow us to document the multiple pipe runs at different elevation (inverts) in the same structure?

Every pipe run needs density, but every structure doesn't need density if the density tests for the common structure is covered on one of the possible multiple pipe runs. This is covered in the system by updating the structure by checking the box “Has Own Lifts” and noting which pipe run the densities can be found for the structure. See an example of this scenario for S-1 in the image below. In addition, providing documentation in the comments section gives extra explanation if densities are missing visually on a single pie run; the reviewer can look at the notes and see which pipe run to go to view the junction box densities.

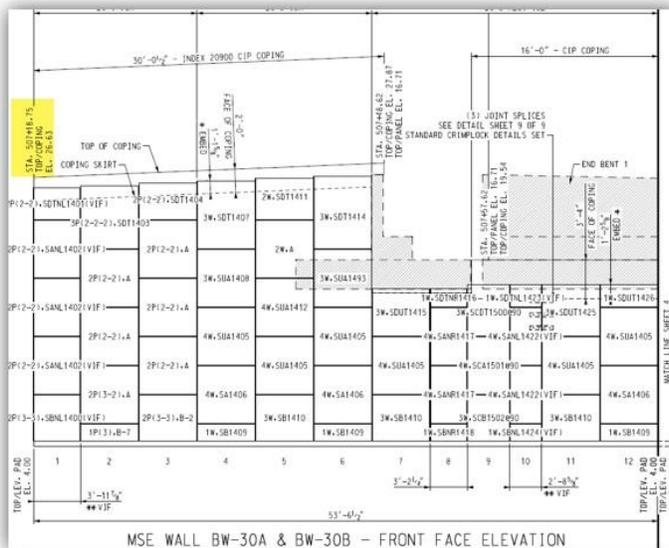
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Retaining Wall PLOTS

1. How do we plot MSE walls that are perpendicular the roadway with respect to stationing?

MAC ERS will allow you to do anything that you used to do in the old Plots program. Anytime you have repeating stations, then you must start a new logbook in MAC ERS. The MSE wall shop drawings do have stations, elevations, and wall length. It may be different from the roadway plans, but it does come with station information. See the example below. If you are to reuse stationing for various wall in the same logbook then each wall must have a separate MAC logbook.



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Project Gauges

1. Who enters project gauges?

A data entry person for each company on the ERS project selects the gauges that will be used on the project from the company's master list.

2. Why would a gauge not show up to be selected on a Field Density test?

Gauges must be listed as a project gauge and have been in a successful 3 way or 2 way comparison. Gauges must have been calibrated within the last year. Gauges must have a project start date before the date test performed.

3. Who enters the gauge comparison data?

A user in the system role of Project Administrator enters the gauge comparisons.

Sample Life Cycle

1. Earthwork doesn't have samples. Only tests. Why is there a Sample Life Cycle?

As part of implementing ERS in MAC, it must use the same sample process as other tests. In MAC, tests need samples, so ERS tests have a MAC sample.

2. Why do some of the sample statuses say something about lab testing?

Because the most type of samples in MAC is lab samples, all samples, both field and lab, follow the lab sample life cycle and use the same sample statuses. Since all ERS tests are field tests, there is no lab.

3. Is the ERS Sample Life Cycle flow different from say a proctor sample?

Yes, ERS is designed so that users can process the samples and tests quickly without having to leave the ERS screen. There are several shortcuts to assist with this. The sample can be created, the test results can be entered, and the sample can be submitted to FDOT all in one step, if all the required data is there.

4. Speaking of the proctor sample, it gets used as part of the field density sample. What happens if it hasn't completed its MAC Sample Life Cycle yet?

It is a common practice for earthwork operations to commence before the proctor sample Maximum Density and comparison status is known. With MAC ERS, there is a risk involved in this practice. It could result in additional steps being needed that bypass the abbreviated ERS sample life cycle and the ERS screen shortcuts. It requires a user with the role of Data Reviewer to process the sample through additional sample life cycle stages from the sample login screen.

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5. Can I use the Create a Sample from this Sample feature on the sample screen for ERS samples?

The feature is on the sample screen; however, the ERS samples are designed to be created and processed from the ERS screen. If all goes well, you don't have to go to the sample screen at all for ERS samples except to correct data or for the PA to create comparison packages. If you attempt to create an ERS sample on the sample screen or use the Create a Sample from this Sample option, you will lose the shortcuts designed into the ERS screen plus you will have to supply additional information, like which logbook the sample is for.

6. I am a subconsultant on the contract using the prime consultant's nuclear density gauge. Will MAC allow this?

Yes, however there are a couple of things to remember. The Prime can either grant access to the sub and the sub must acknowledge it or the technician (who is also a user) can be added as a company user on the Prime's company profile. Either way, when the technician creates a sample, MAC will ask them to select one of the companies they are assigned to. It's important to select the company of the gauge so it will be available to be selected on the test screen.

7. What are the responsibilities of the Project Administrator in ERS?

As mentioned earlier, the PA reviews the ERS plots and enter the gauge comparisons. For Sample Life Cycle, the PA finalizes all ERS samples and creates comparison packages for field density samples. The PA works with the ERS IA Project Program Maintenance User to resolve any issues related to material acceptance. The role of Project Administrator (PA) in MAC is responsible for the sample finalization of all project samples and other functions related to materials acceptance. The person in this role must be familiar with the contract requirements. The permissible delegate for the PA for ERS is the Lead Earthwork Verification Inspector.

8. Why doesn't the PA have to create comparison packages for mixing depth checks and base thickness tests?

These sample employ a process on the QC sample that is known as Witnessed By. When the QC data entry is complete, the company of the Verification Technician can be notified that the VT TIN is ready to be entered on the QC sample. The VT reviews the sample and if the sample review is successful, they enter their TIN. Then MAC notifies the QC company that the sample can now be submitted. If the VT's review is not successful, they can make a comment about what needs to be addressed. Since the VT reviews the sample, there is no need for a PA to also review it, so the sample is auto finalized. Since there is no VT sample, there is no comparison package.

9. Who marks samples for Rework when there is a disturbance in previously tested material like a washout?

A user with the role of Data Entry in one of the companies designated as QC on the ERS project has the ability to designate samples as reworked.

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10. When QC and VT field densities do not compare, the QC technician performs the resolution test. Will MAC allow this without a conflict of interest?

Yes. The QC technician will enter the resolution results under the MAC Sample Level of “QR”. The QC technician’s test results must pass and there is a designation for the comparison of the QC and VT dry densities that must also compare. Before QC technicians performs the test, they should coordinate with the VT technician and get the gauge manufacturer and VT Dry Density value.

11. I’m a QC technician and I need to perform QR. I can’t find the VT technician. What do I do for the information I need described in the answer above?

For the gauge manufacturer, you can review the Gauges tab on the ERS project, but you will need to know which gauge was used in order to figure out the manufacturer. You can see which gauge VT used by generating the ERS – Density report under the Projects Tab on the Report screen. For the gauge number and VT Dry Density Value, this data is displayed even if the sample is not yet finalized. With the gauge number, you can look at the gauge tab to see the manufacturer.

12. I’m a QC technician and my QC field density test fails. Do I have to enter failing QC field density tests in MAC?

No. If a QC field density test fails, double check all the data to make sure the failure isn’t from a typo; for example, you selected the wrong proctor sample and with the right proctor sample it passes. If the data is right and the test is failing, it becomes a process control test. Simply X out of the Sample dialog box and retest later.

Job Guide Schedule

1. Does the ERS Project impact the JGS?

Yes, the MAC Specs with the ERS tests on them are designated to begin being assigned to projects let on or after October 1, 2021. The MAC Specs previous to the workbook edition do not have the tests so you may be able to create an ERS project and plots, but when you attempt to perform the test in MAC, it will show an error message of **“There are no Valid Specs set up for this Sample to be created with”**.

2. Is this why I need to let the District Materials Office know if I want to a MAC ERS Project on a job let before October 1, 2021?

Yes. There is a way to get a project specific MAC Spec on the JGS to apply the requirements to older jobs if it is requested.

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Reports

1. What reports will be available for MAC ERS?

As stated earlier, one of the advantages to having the ERS data in MAC is the ability to create reports. Many reports have already been created. This includes, but is not limited to:

- Gauge Calibration
- Gauge Comparison
- Base Thickness
- Density
- Mixing Depth
- Summary of Proctors
- Unqualified Technicians
- Witnessed By Technicians

2. Does this mean we don't have to code the base thickness results into the ENGMENU program to get a base thickness report?

Yes, on projects with an ERS project, you don't need to create the old base thickness report. However, on projects with a paper logbook, the base thickness results from the paper logbook will still need to be entered into the ENGMENU program and the report generated until all the paper logbook projects are completed and retained in CDMS for future reference and a copy of the CDMS document number provided to the Materials Certification Review personnel.

3. Is there a report to print the plots?

No, but there is a print plot feature on the ERS project screen, so we don't need a report.