

SECTION 846 Materials Data Collection and Reporting Software System

846.1 General

846.1.1 Overview

This section addresses the department's electronic materials data collection and reporting software system by discussing its associated components/modules and their general operation; provides troubleshooting procedures; listing user FAQs; and, support contact information connecting users with regional expertise and subject matter experts.

The information presented is additional reference and guidance to aid in resolving and reporting malfunctions with the software system. Please note that the many functional aspects, access to the eGuide, and training materials are available electronically through the Atwood Systems website at:

<http://www.atwoodsystems.com/>

846.1.2 Terms and Definitions

MRS: Materials Reporting System. Contractor data entry, consists of 4 individual modules (PCC; IRI; HMA; Soils & Aggregates).

MIT: Materials Information Tracking (Field Version). Department data entry (Regional/Local), database stored on local devices.

MTS: Materials Tracking System. Department data entry (BTS).

HQMS Highway Quality Management System website. Database web server for materials reports and test results. View and access reports through the Atwood Systems website.

Oracle Database: Software data storage system, object-relational database stored on centralized department servers.

eGuide: On-line document generator for developing a project-specific sampling and testing guide for standard bid items in each contract. Used primarily by the assigned project materials coordinators.

846.2 System Component Overview

Atwood Systems originally developed, currently provides, and assists with maintenance and upgrade activities for multiple department software components used for the reporting of materials sampling and testing results. These software components are linked to a centralized Oracle database and provide a permanent record of documentation supporting project materials acceptance. There are three primary software components for contractor and department construction personnel to be familiar with, along with the website where all submitted data is viewed.

846.2.1 MRS (Materials Reporting System)

The MRS component of the software is used by contractors and contains 4 separate modules for entering data generated on WisDOT construction projects. The modules are for HMA, PCC, IRI, and Soils & Aggregates. To have any of the appropriate MRS components installed onto individual user computers, contact Atwood Systems at:

<http://www.atwoodsystems.com/>

846.2.1.1 MRS-PCC

The MRS-PCC module is used by contractors to report concrete pavement and concrete structures data. More specifically, the contractors use the MRS PCC module to submit concrete mix designs, to report concrete compressive or flexural strength QC results, concrete pavement thickness measurements as determined by probing, and MIT Scan plate locations. Additional detail pertaining to requirements for concrete data submittals can be viewed in [CMM 835](#) and [standard spec 701](#).

846.2.1.2 MRS-HMA

The MRS-HMA module is used by contractors to report HMA pavement density QC data and to submit HMA mix designs to the department for approval. Additional detail pertaining to pavement density and HMA Mix Design submittals can be viewed in [CMM 815.16](#) and [CMM 866.2.5](#) respectively.

846.2.1.3 MRS-Soils and Aggregates

Revise 846.2.1.3 to add additional reference to CMM and WisDOT's Manual of Test Procedures (MOTP).

The Soils and Aggregates module of MRS was created for contractor use and currently consists of five test prefix reports: 162 - Fine and Coarse Aggregate for Concrete; 217 - Aggregate for Base Courses and Backfill; 224 - Coarse Aggregate Source Certification; 230 - Soils; 232 - Soils and Aggregate Nuclear Density. Additional detail pertaining to requirements for aggregate sampling, testing methods and data submittals can be viewed in [CMM 834](#), [CMM 860](#), and [WisDOT's Manual of Test Procedures \(MOTP\)](#) (<https://wisconsindot.gov/Documents/doing-bus/eng-consultants/cnslt-rsrcs/tools/qmp/motp.pdf>).

846.2.1.4 MRS-IRI

The MRS-IRI module is used by contractors to submit ride profiling data. The program allows users to attach profiler *.ppf raw data files and also attach *.pdf files of the ride quality module reports to serve as reference files. The *.txt files of the ride quality module reports can be "imported" into MRS-IRI to auto-populate the data fields of the segment details and the roughness screens.

846.2.1.4.1 Automatic Calculation

The program calculates pay adjustments for segment IRI and for localized roughness. Reviewers are to evaluate the imported information in the Highway Quality Management System (HQMS) website. Pay attention to areas that were excluded and to segment categories since the categories trigger which formulas are used to calculate pay adjustments. Reviewers will provide comments regarding any revisions to pay adjustments.

Additional detail pertaining to specifications for Ride Quality measurements and reporting requirements can be viewed in [standard spec 440](#) and [CMM 838](#).

846.2.2 MIT

Materials Information Tracking is used by WisDOT and WisDOT consultant field staff to report QV (quality verification) and IA (independent assurance) sampling and testing data. MIT is similar to the contractor MRS program in that it consists of various numbered (prefix) test reports. It is also similar in the sense that it needs to be installed on users' individual computers and does not have a direct network connection.

846.2.3 MTS

The Materials Tracking System is a network-based system used by WisDOT Materials Lab personnel, IA Specialists, and regional materials personnel to enter materials test results or documentation data. The MTS is installed on numerous department Local Area Network (LAN) servers so that it can be accessed by department personnel from statewide regional offices and sign shop locations. Data entered into the MTS is uploaded into the Oracle database that is housed in central office. All materials numbered (prefix) test reports can be created or viewed in the MTS.

846.2.4 HQMS

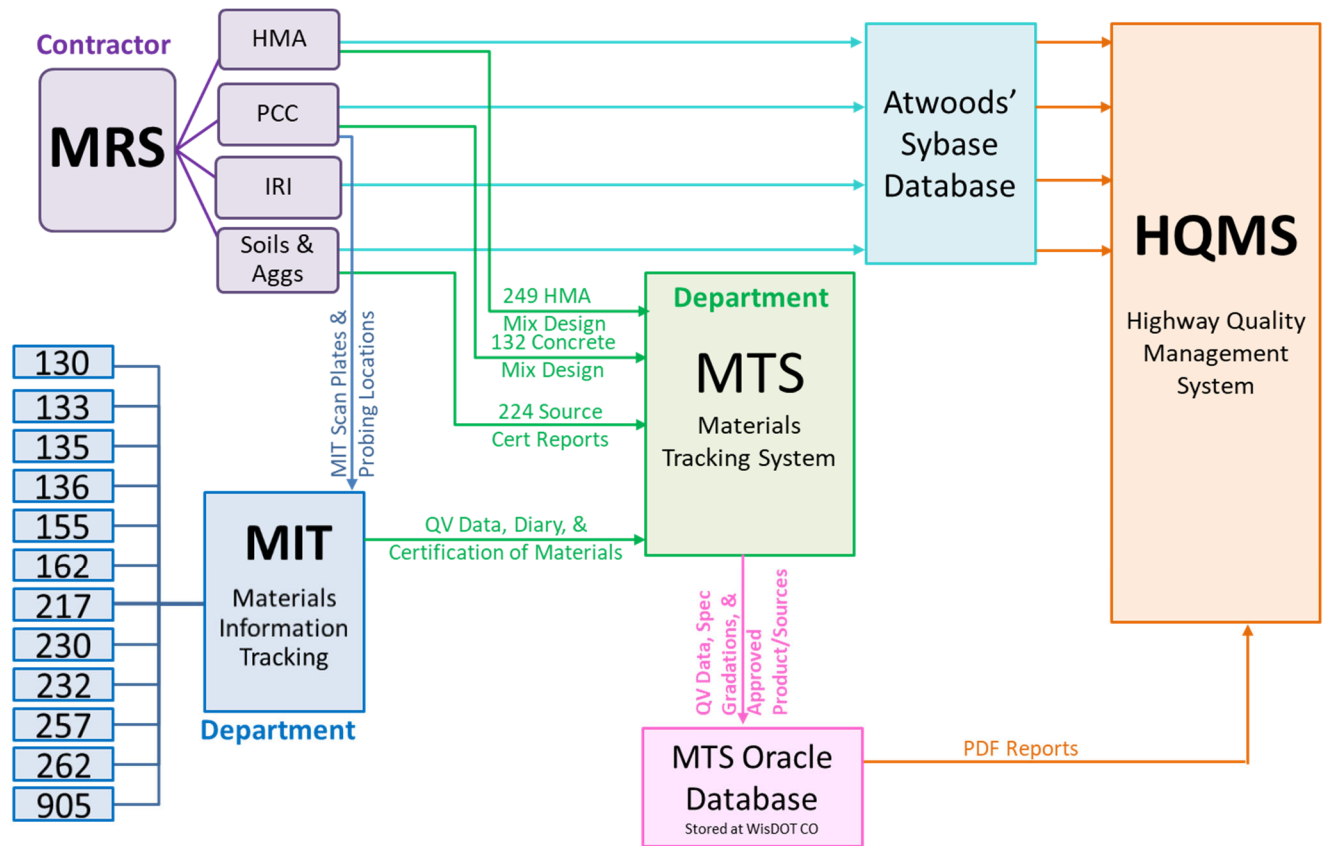
The Highway Quality Management System database is maintained by Atwood Systems and the HQMS website can be accessed through their homepage at:

<http://www.atwoodsystems.com/>

After logging into the HQMS website, users arrive at the HQMS main menu page. Information can then be searched for by Material Type and Project ID.

Figure 846-1 depicts the flow of information between the key software components and illustrates the path from independent computers to the database for final review and reporting to the Highway Quality Management System website. Notice that the pathway can vary based on the type of material or report you're working with.

FIGURE 846-1 Flow of Materials Information



846.3 Electronic Reporting System Operations

With the creation and requirement of QMPs, WisDOT recognized the importance of capturing materials test data electronically to represent the products being incorporated into construction projects. This data serves as a permanent record and also provides information on a statewide basis to improve specifications. The current system was developed and continues to evolve to service that need.

846.3.1 Primary Users, Logons (location IDs/Project IDs), Passwords

Software components are used by contractors, department staff, and consultant personnel. Material reports can be created, reviewed, edited, verified, viewed, printed, sorted, and searched. WisDOT approved products, certified suppliers, and source lists are also available through the website.

To logon to any of the software program modules or the website, each user is required to have a User ID and Password. As a "new user" the User ID and Password are requested, created and tracked through Atwood Systems. Some of the components allow the user to create their own ID and password while other areas define a standard password to gain access. Information required from a new user is minimal and of a non-personal nature. Logon IDs and associated passwords are required in order to assign user authorities/permissions and are employed to protect data integrity and system security, see figure 846-2 for log on for MTS and MIT pages.

FIGURE 846-2 Flow of Materials Information

The figure displays two distinct login interfaces. The left interface, titled 'Software Component Logon', is a desktop application window for the 'Wisconsin Department of Transportation Materials Tracking System'. It features a blue header, a Wisconsin state flag logo, and input fields for 'User ID' and 'Password'. Below these are 'Logon' and 'Cancel' buttons. System information such as 'Run Folder', 'Version Date', 'Log File', and 'Database' is listed at the bottom. The right interface, titled 'Web Site Sign in', is a web-based login page. It includes a 'Please Sign In:' heading, input fields for 'User ID' and 'Password', and a 'Sign In' button. Links for 'Sign up as a new user' and 'Forgot your password?' are located on the right side. A disclaimer and 'Terms of Use' link are at the bottom, along with contact information for support.

Software Component Logon

System Logon

Wisconsin Department of Transportation
Materials Tracking System

WISCONSIN
1846

User ID: Password:

Logon Cancel

Run Folder: N:\Apps\MTS\LAN\
Version Date: 9/23/2016
Log File: N:\Apps\MTS\LAN\log\preconnect.log
Database: OP01

Designed, Developed, and Supported By Atwood Systems

Web Site Sign in

Please Sign In:

Sign up as a new user
Forgot your password?

User ID

Password

Sign In

By clicking Sign In you agree to our [Terms of Use](#)

Email: support@atwoodsystems.com | Phone: (608) 848-6085 | Toll-free: (877) 518-1920

To request or change authorities/permissions for MTS and MIT, contact the BTS representative. For MRS, contractors contact Atwood Systems directly. Contact information is located in [CMM 846.6.2](#).

846.3.2 Prefix Title Listing

While reports have specific titles indicating the type of material being tested or type of report being compiled, it is common practice to reference the report entry screens by their test "prefix". The software system currently supports over 50 reports. A reference listing of these prefixes and associated subject titles can be found in table 846-1 or within the software system as a drop-down selection box list.

TABLE 846-1 MTS, MIT, and MRS Prefix List

No.	Description	Application	No.	Description	Application
101	Steel Bars - Concrete Reinforcement	MTS-CO	170	Geotextiles	MTS-CO
103	Steel Wire & Mesh - Concrete Reinforcement	MTS-CO	172	Geogrid	MTS-CO
105	Steel Plate Beam Guard	MTS-CO	177	Corrugated Drainage Pipe	MTS-CO
106	Uncoated Steel Strands - Prestressed Concrete	MTS-CO	180	Concrete Brick, Block, & Pipe	MTS-CO
112	Steel Sheets - Culverts	MTS-CO	217	Aggregates for Base Courses & Backfill	MTS, MIT, MRS
115	High Strength Bolts, Nuts, & Washers	MTS-CO	223	Fine Aggregate Source - Certification	MTS-CO, MRS
120	Chain Link Fence Fabric	MTS-CO	224	Coarse Aggregate Source - Certification Submittal	MTS-CO, MRS
121	Rolled Formed Sections - Chain Link Fence	MTS-CO	225	Coarse Aggregate Source - Certification Approval	MTS-CO
122	Pipe- Chain Link Fence	MTS-CO	230	Soils	MTS, MIT, MRS
123	Tension Wire - Chain Link Fence	MTS-CO	232	Soils & Aggregate Nuclear Density	MTS, MIT, MRS
126	Woven Wire Fence Fabric	MTS-CO	249	Asphalt Mix Design - Contractor Submittal	MRS
127	Barbed Wire - 2 Strands	MTS-CO	250	Asphalt Mix Design Verification	MTS-CO
128	Smooth Wire - Woven Wire Fence	MTS-CO	254	Asphaltic Mix Verification	MTS
130	Compressive Strength - Concrete Cylinders	MTS, MIT, MRS*	257	Asphalt Mix Testing	MTS, MIT
131	Water - Concrete	MTS-CO	259	Asphalt Job Mix Formula - Field Changes	MTS
132	Concrete Mix Designs	MRS	262	Asphaltic Pavement Nuclear Density	MTS, MIT, MRS*
133	Concrete Flexural Strength	MTS, MIT, MRS*	330	Performance Graded Binder	MTS-CO
134	Concrete Surface Resistivity	MTS, MRS*	332	Emulsified Asphalt	MTS-CO
135	PCC Probing Thickness	MTS, MRS*	334	Asphalt Binder AMRL - Lab Accreditation	MTS-CO
136	Concrete Thickness - MIT Scan	MIT, MRS*	801	Aggregate Gradation - IA	MTS
140	Concrete Curing Compound	MTS-CO	802	Concrete Mixtures - IA	MTS
150	Portland Cement	MTS-CO	803	Asphaltic Pavement Density - IA	MTS
151	Ground Granulated Blast Furnace Slag	MTS-CO	804	Asphaltic Mixtures - IA	MTS
152	Fly Ash	MTS-CO	805	Soils & Aggregate Nuclear Density - IA	MTS
155	Miscellaneous Materials	MTS, MIT	806	Compressive Strength Concrete Cylinders - IA	MTS
162	Fine & Coarse Aggregates - Concrete	MTS, MIT, MRS	905	Materials Diary Inspection	MTS, MIT

* Contractors report test result data in a similar format, but not on the "test prefix reports".

MTS-CO = Lan Central Office
Contractors

MTS = Lan Regions

MIT = Regions MRS =

846.3.3 Data Entry-General

There is some basic/common information required for new test data being entered into the system. Once data has been entered a "save" action is required, and to eventually be followed by either a "submit" or

"verify" or "review" action. Pulldown menu boxes are provided to aid in maintaining consistency and efficiency.

There is a timeout function associated with the database, and users are cautioned/reminded to "save" data frequently to avoid having to re-enter when interruptions cause a timeout to their session.

846.3.4 Sample Card Tab

The sample card for materials test prefix reports is aimed at providing information that defines certified samplers/testers, dates, project IDs, and pertinent materials identification or test types. Required fields are typically denoted with a red asterisk and are sometimes necessary to be filled-in before moving on to new screens or report tabs.

846.3.5 Test Data Tab

For test prefix reports users click the "Test Data" tab to open the worksheet portion of the system. Cells available for raw data entry are typically indicated by "boxes" while many programmed calculations are performed internally and additional fields are automatically populated

846.3.6 Automatic Calculations

Many of the individual screens and programs have internal formulas to provide automatic calculations. These formulas are tied to specification requirements and in some cases perform calculations involving incentives and disincentives. Reviewers are to evaluate any imported information in the Highway Quality Management System (HQMS) website before final verification of reports. Reviewers will also provide comments regarding any revisions to pay adjustments.

846.3.7 Reports

Reports representing individual test prefix numbers can be previewed, generated, and printed on a per test, per project, or statewide basis. Reports representing multiple projects can also be exported into different formats for analysis. Any changes made to existing "verified" reports will require re-verification. Deleting existing test-prefix reports requires authorization to do so as the database automatic numbering system is affected.

846.3.8 Reviewing Reports and Data Entry

"Reviewers" will need to retrieve various data screens before final approvals/verifications to evaluate accuracies for quantities of affected materials and any estimated payments. Accessing reports is accomplished through the MTS or HQMS website.

846.4 System Version Updates

As new construction materials/products are introduced, specifications evolve, or new QMP requirements are developed, program edits and upgrades become necessary to document the associated acceptance activities. Due to the complexity of contract budgeting and software coding processes, it is intended that new full version releases are limited, yet timely enough to accommodate the department's reporting needs during construction.

846.4.1 Calendar Cycles/Frequency

Version updates are targeted to be once annually (i.e. early Spring/March). Enhancements are solicited annually through materials technical team meetings, user group conferences, and periodic user surveys.

846.4.2 Beta Testing

Beta testing on new program versions will be over a period of approximately 4 weeks and will occur with the help of subject matter experts before statewide new version releases.

846.4.3 Communications/Notification

Users will be notified through email by the department when new versions of MRS/MIT/MTS have been released. This upgrade to the servers typically occurs at the end of a week and requires users to be logged off their system in order for the new version to become effective upon next login.

846.4.4 System Maintenance

Items considered to fall under the umbrella of "maintenance" are applied to existing system features or screens and would typically include corrections for: typographical errors or misspellings; cell labelling or terminology; adjusted formulas or calculation values; screen aesthetics for improving efficiencies or clarity; adding cell character length; adding print report features; etc.

A blanket work contract is used to maintain the system on an annual basis and is typically a standard lump sum to charge services against.

846.4.5 System Enhancements

Items considered as "enhancements" require either extensive program re-coding to existing features or involves the creation of new features. Some examples would be: new test screens (prefixes); new

automation (ex: automatic cell populations); changes in formula anchors or the addition of new process calculations; database changes; creating new print-reports; operating system upgrades for compatibility; etc. Enhancement suggestions are considered based on the ability to improve system functionality. Enhancement "wish" lists are then compiled and prioritized for operational impact and available funding. Enhancements require that a work contract be developed, detailing the specific items being requested and their associated cost.

846.5 Troubleshooting System Malfunctions or Inconsistencies

Beta-testing is intended to assure full operational success with new version releases; however, a number of circumstances can influence the actual success rate. If users experience difficulty with the software programs or component features, a process has been put in place to log the issue, seek explanation, track and record debugging resolutions.

846.5.1 Contact Person

If users experience difficulties with data inputs or report outputs, follow these steps:

1. Check the "Top FAQs" in this section (8-46.7) for potential self-solve information.
2. Contact the regional support personnel listed in 8-46.6.1 to discuss the issue and possible resolution.
3. Email an informational request to BTS (see contact listing).
4. When warranted, work directly with Atwood Systems (8-46.2) on a fix, by allowing access to individual affected computer.

846.5.2 Follow-up

After a solution has been proposed and corrections made, the "user" originating the inquiry will be contacted by the solver if the user wasn't directly involved in the solution. If the user was part of the resolution process, the user or contact will notify BTS when the correction has been applied successfully.

846.6 Support and Contacts List

846.6.1 Oversight Committee (Department/Contractors)

The department has created a team to support user data entry activities. The primary goal of this committee is to provide subject matter expertise for the WisDOT materials reporting programs (MRS, MIT, and MTS). Team members will also recommend program enhancements and revisions and also assist with beta-testing of new versions before statewide releases.

The following is a list of primary and secondary contacts. Please contact your regional representatives for data entry assistance or to report software program concerns.

Region	Primary Contact	Secondary Contact
NW Region	Taylor Copp 715-392-7865 taylor.copp@dot.wi.gov	Mark Foster 715-839-3785 mark.foster@dot.wi.gov
NC Region	Steve Hunter 715-365-5753 steven.hunter@dot.wi.gov	Theresa Janicki 715-697-0104 theresa.janicki@dot.wi.gov
NE Region	Travis Maatta 920-366-5790 travis.maatta@dot.wi.gov	Jamie Cynor 920-366-8096 jamie.cynor@dot.wi.gov
SW Region	Jeanette Frazer 608-792-0943 jeanette.frazer@dot.wi.gov	Matt Smith 608-516-6527 matt.smith@dot.wi.gov
SE Region	Deann Balog 262-548-5697 deann.balog@dot.wi.gov	

Additional Bureau Contacts, BTS (Central Office):

1. Adam Johnson, 920-492-4124, adam.johnson@dot.wi.gov
2. Jeff Anderson (HMA), 608-246-5656, jeffrey.anderson@dot.wi.gov
4. Myungook (MK) Kang, 608-246-7957, myungook.kang@dot.wi.gov

846.6.2 Atwood Systems

Atwood systems provides expertise and services to WisDOT after developing a software system in 1999 capable of materials data collection and its subsequent management. Home page web address:

<http://www.atwoodsystems.com/>

1. Gary Lynch, 608-848-6085, garyllynch@atwoodsystems.com

2. Ryan Seffrood, 608-848-6085, ryan@atwoodsystems.com

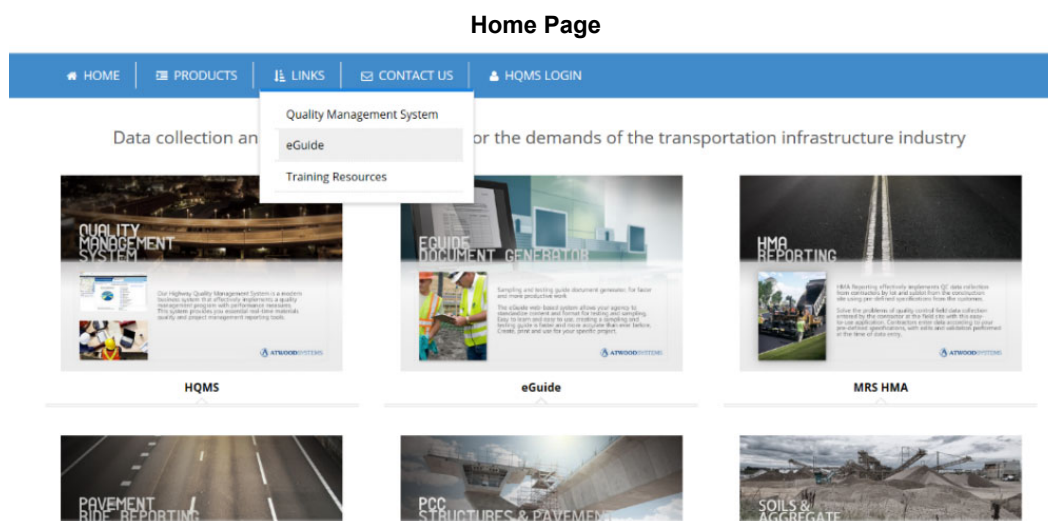
Address: Atwood Systems, 509 Commerce Parkway, Verona, Wisconsin 53593

Office Phone: Toll Free at 877-518-1920, 608-848-6085, info@atwoodsystems.com

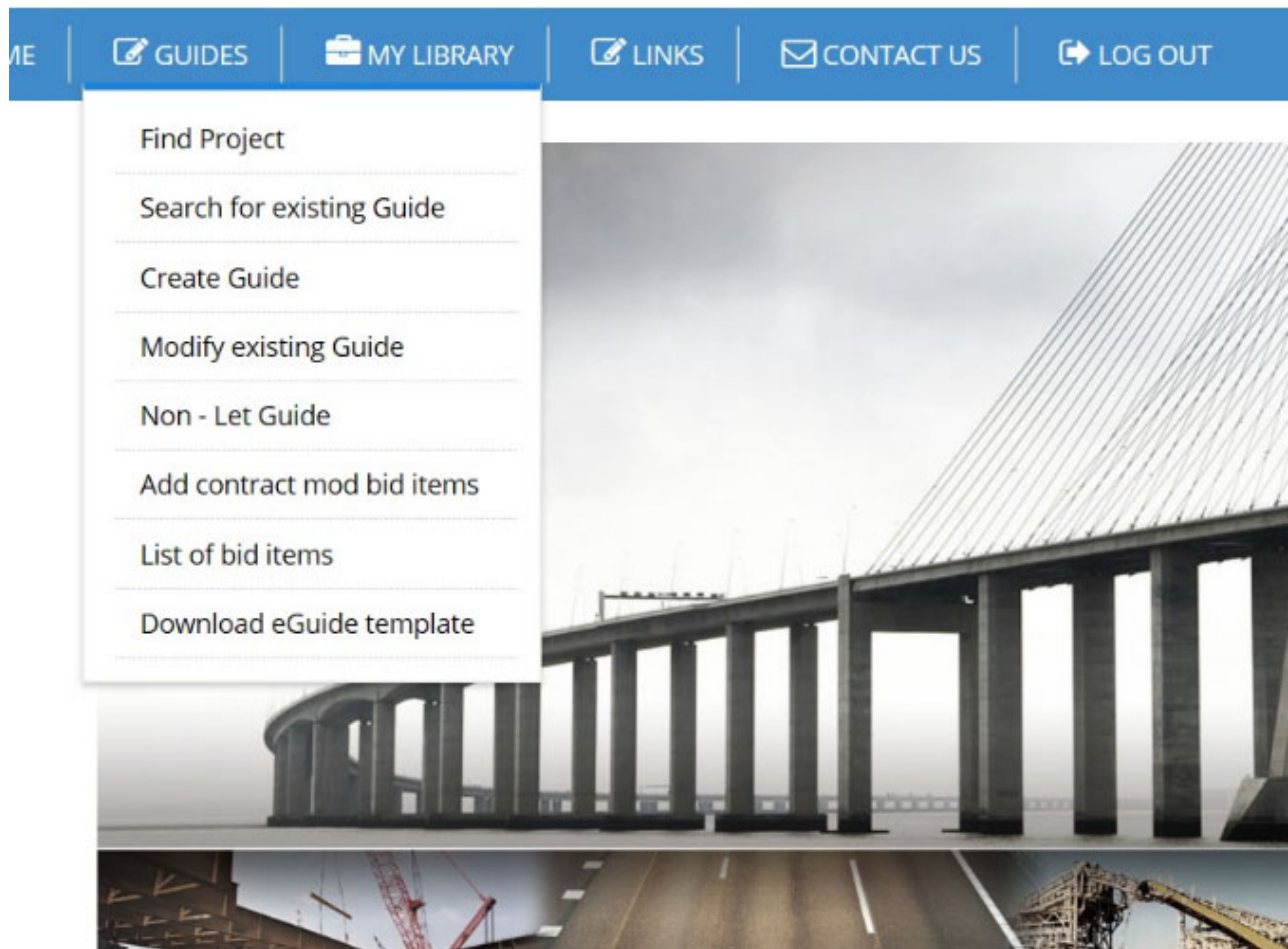
846.7 Top FAQs

1. I can't remember my logon ID or Password? Contact Atwood Systems directly by email or phone.
2. I can't find a project ID in order to enter my test data? Check contract let date to ensure it would/should be in the system. Also check to see if the project is listed under the Non-Let Projects tab. Suggest using the "map" feature in HQMS if the project location is known or contact a WisDOT local/regional Materials Coordinator.
3. What happens if I'm interrupted during data entry and my screen times out? The system will only remember the information entered up to the last "save" action (this is part of the database security measures). It is recommended to "save" often, during entry activities.
4. How do I convert my profiler IRI measurements (from PROVAL) to submit to the department? Refer to [CMM 838](#).
5. I've entered my HMA mix design onto a MTS-249 and submitted it to the department but I don't see the verified report? Be sure the proper associated time has elapsed before seeking the design approval information. Check to see that the design information has actually been "submitted" versus just being "saved".
6. I've received confirmation that my Aggregate source has been approved; however, I don't see it listed on the Approved Sources List, what do I do to start work "today"? Posting to Approved Products lists is a separate department process that may lag behind notification of source approvals. Suggest to check or "print" a copy of the associated test prefix report (ex: 162 or 225) to validate starting work, if meeting the appropriate specs.
7. My Aggregate source has historically been approved; however, during my data entry I receive a message stating it's "not available", what do I do? Check the pertinent 162 or 225 report against any updated specs or required verification testing parameters (ex: source quality testing timeframes for renewal per [standard spec 106.3.4.2.2](#)). If source meets the appropriate specs, suggest to complete data entry with a "save" action, to be edited at a later time, and note in the comments/remarks.
8. How do I interpret if an Aggregate Source can be used for my project? Pull up the [APL](#) and note the uses listed "beneath" the source legal description.

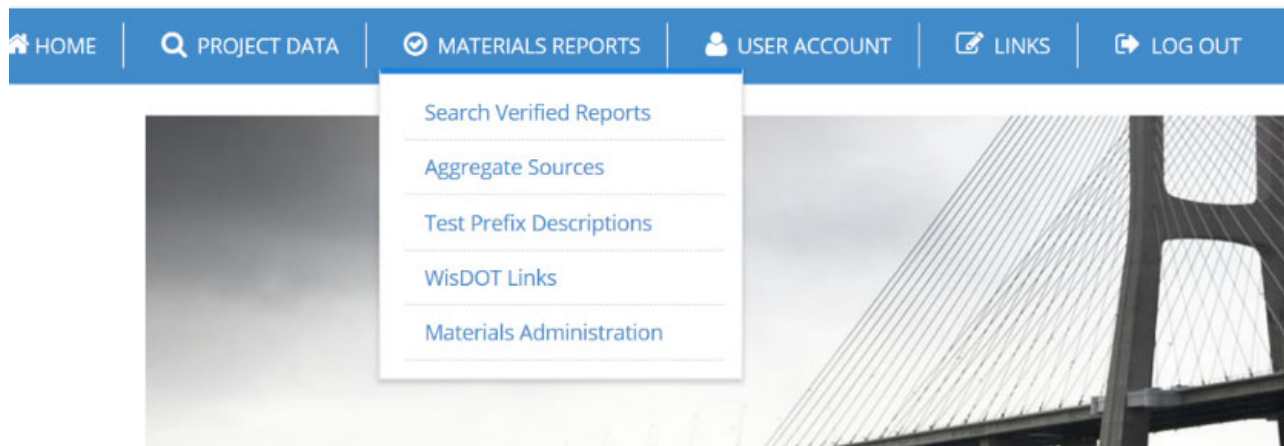
846.8 Atwood Systems Screenshots



eGuide Menus



HQMS example search Menus



Search Projects

Search Projects
Request Review Authority

My Projects Project / Contract ID or Description Material Type Use Map

Projects you have recently viewed or worked on (up to 15):

[Click here to manage your projects list](#)

[View Data](#) 1005-10-72 IL State Line - Madison (I 39)
[View Data](#) 1014-00-62 WISCONSIN DELLS - PORTAGE (I 90)
[View Data](#) 1520-02-71 Wisconsin Rapids - Plover (STH 54)

Search Projects List:

My Projects Project / Contract ID or Description Material Type Use Map

Click on map for a list of projects by county:

Then select from this list:



Found 84 projects for **Wood County**. [Clear Search](#)

[View Data](#) 1520-00-61 PITTSVILLE - NEILLSVILLE (STH 73)
[View Data](#) 1520-00-71 PITTSVILLE - MARSHFIELD (STH 13)
[View Data](#) 1520-02-71 Wisconsin Rapids - Plover (STH 54)
[View Data](#) 1525-05-74 CITY WISCONSIN RAPIDS (STH 13)
[View Data](#) 1620-00-75 CENTRAL AVE, CITY MARSHFIELD (STH 13)
[View Data](#) 1620-00-77 BRANCH YELLOW RIVER CROSSING & APPROACHES (STH 80)
[View Data](#) 1620-01-73 CENTRAL AVE, CITY MARSHFIELD (BUS 13)
[View Data](#) 1620-01-77 CENTRAL AVE, CITY MARSHFIELD (BUS 13)

View Project Data

HOME | SEARCH PROJECTS | VIEW PROJECT 1520-02-71 DATA | MATERIALS

Project 1520-02-71 Wisconsin Rapid
Contract ID: 20160510031

Field Office Details

Office: (715) 424-0124

Cell: Not Available

Fax: (715) 424-0131

Project Info

Verified Reports ✓

Structures ✗ NO DATA

Pavement ✓

PCC Thickness ✓

HMA ✗ NO DATA

Ride ✗ NO DATA

Soils & Aggregate ✗ NO DATA

Aggregate Sources ✓

Issue Reporting Template - Example email message

Send | Cc... | Subject: Materials e-Reporting Issue

- MTS
- 0-254-0001-2016
- Test Data Tab
- When creating a test an error box pops up on the sample card and then associated verified mix design information isn't available to be pulled in

Retrieval Error

Error fetching VA Target, Min, Max data

OK

Sample Card | Test Data | Currently Assigned Projects

0 - 254 - 0001 - 2016

WisDOT Design ID: [] Design ID: []

Mix Type: [] Design Gmm: [] Design Gsb: []

NMAAS: [] Design Gmb: [] Design Pb: []

Verification Test Results:

Sample ID #	Sample Ton/Day	Accum Ton	JMF Gsb	JMF Pb	Gmb A	Gmb B	Gmb AVE	Gmm	%Va	%Vma	
3-1-	308	4597	2.711	5.2	2.461	2.463	2.462	2.532	2.0	13.9	
									Target	4.0	0.0
									Parameters	2.7 - 5.3	0 Minimum
										FAIL	PASS

5. Jane User at 608-246-0000

Please call to discuss or email the following information to the Regional Contact:

For emails, in the subject line use "Materials e-Reporting Issue", then in the body of the message:

- System Component Affected (i.e. MRS-HMA, MRS-PCC, MRS-IRI, MRS-Soils and Aggregates, MIT, MTS, or Other)
- Test Report Number or Screen Prefix
- Function reference (i.e. login, sample card, test data, calculations, etc?)
- Short description of the problem and a representative screenshot(s)
- Follow-up user contact phone number (if other than provided in the signature information)