8-45.1 Material Testing and Acceptance - General
All materials must meet contract specifications. The guidance provided herein is for personnel and project material coordinators engaged in the inspection, sampling, testing, approval, documentation and reporting of materials to be incorporated in highway construction work performed under the jurisdiction of the Wisconsin Department of Transportation. Requirements of the independent assurance sampling and testing program are not included in this section and are in CMM 8-20.

Closely observe produced materials for visual evidence of changes in quality. It may be appropriate to increase the frequency and scope of testing and acceptance activities to properly assure material compliance.

Consult the department regional materials representative regarding any doubts pertaining to compliance of source inspected materials, field inspection reports, waiver of testing, unlisted items, evaluation of certifications, or other questions regarding acceptance procedures.

8-45.2 Material Requirement References
8-45.2.1 Material Testing and Acceptance Guide
In addition to WisDOT’s Standard Specifications for Highway and Structure Construction, the Materials Testing and Acceptance Guide, CMM 8-50 Exhibit 1, details many of the sampling, testing, and documentation requirements for various materials, which are mobilized into the contract via Standard Spec 106.3. Minimum requirements are provided in the guide, as well as direction for additional testing on certain materials when test results demonstrate nonconformance.

8-45.2.1.1 Acceptance of Small Quantities
The project engineer may waive field sampling, testing, or source inspection for small quantities of some materials that are supplied by a known manufacturer or producer. The Materials Testing and Acceptance Guide, CMM 8-50 Exhibit 1, defines the items that qualify for small quantity acceptance as well as the quantity thresholds. Sampling and testing cannot be waived for structurally critical items or for materials/products that affect the safety of the traveling public.

Small quantities of materials that qualify, may be accepted by the project engineer based on one or more of the following methods:

1. Visual inspection provided the producer or manufacturer has recently furnished similar material found to be satisfactory.
2. Certification by the producer or manufacturer stating that the material conforms to the specification requirements.
3. Material is on a WisDOT approved (pre-qualified) list.

8-45.2.2 E-Guide
E-Guide is an automated system that produces a handy sampling, testing and documentation guide for material requirements on a project. The program generates guidance automatically based on the bid items included in a project and it also allows for manual input of non-standard special provision (SPV) items. The documents that are input into the E-Guide system are created by an E-Guide committee. The committee reviews the standard specifications and CMM 8-50 to compile the information into a succinct guide of specific material requirements.

The WisDOT project material coordinator prepares an E-Guide and provides a copy to the contractor's material coordinator. Consult the department’s regional materials representative for guidance when developing the E-Guide. CMM 8-50 Exhibit 1 should be cross-referenced with the E-Guide since it contains detailed information for specific materials. Contact the regional materials engineer if any information within the documents is inconsistent. The materials engineers will work with Bureau of Technical Services, Quality Assurance Unit to resolve any issues. The E-Guide program can be accessed through the 'Log in' tab on Atwood Systems website at:

http://www.atwoodsystems.com/

The E-Guide does not supersede material requirements in the Standard Specifications, CMM, or contract special provisions.

8-45.2.3 Conditionally Preapproved-Shop or Source Inspected
Certain materials are conditionally preapproved at the manufacturing plant or source of supply based on inspection and review of relevant test results. Those materials will typically bear tags, stamps, or other markings that indicate that they have been preapproved. These materials may be incorporated into the work if the
materials appear to be in acceptable condition based on a job-site examination. Documentation of the markings, stamps and physical condition should be included in the material diary entry under the basis for acceptance (BFA). Reference the original shop inspection and laboratory test reports in the Inspector’s Daily Report and electronically in a MIT/MTS prefix 905 report.

If materials that require inspections and preapproval at the source are delivered to a project site without any appropriate markings indicating preapproval, they may be rejected by the project engineer. Or, the materials can be approved and incorporated into the work based on satisfactory job-site examination and testing. Contact the department’s regional materials representative to verify acceptance of the material.

8-45.3 Approval Methods

8-45.3.1 Approval Methods - General

Project staff will approve materials for use on the project. Method of required material approval is defined in the specification, contract documents, and CMM. Primary approval methods are any of the following or combination thereof:

- visual inspection,
- manufacturer certificate of compliance,
- certified report of test or analysis,
- Buy America certification,
- product data sheets,
- approved product lists,
- material sampling,
- material testing results,
- bill of lading,
- on-site material photos,
- shop drawings,
- DT forms,
- shop/plant inspections,
- source approvals,
- field inspection and
- other documentation as appropriate.

Note: Standard Spec 106.3.2 stipulates that the department reserves the right to retest or re-inspect plant-inspected and other pre-approved materials after delivery to the project site and to reject materials that are found not to comply with the contract requirements.

If a material fails to meet specification requirements of the contract, document the specifics including disposition of the material within the remarks box of the applicable MIT/MTS certification of materials report. Refer to chapter 5.13 of the “MTS and MIT User Guide” found under the “Materials Reporting” heading on the quality management program (QMP) website.


8-45.3.2 Approval Methods - Materials

8-45.3.2.1 Visual Inspection

Project staff is to document the properties inspected and record any necessary details regarding the approval of the material.

8-45.3.2.2 Manufacturer Certification

Manufactured products or assemblies may be approved based on tests performed by the manufacturer when certified. Some products only need a product certification, while others require a product certification and a production plant certification.

Manufactured products may be accepted by a certification of compliance or a certified report of test or analysis either as sole documentation for acceptance or as supplemental documentation (see Standard Spec 106.3).

Products that are from certified sources are approved by verifying that the source, manufacturer, or plant is on the appropriate approved list and provides a certification of product compliance showing that the product meets the pertinent specification and contract requirements. Or, by submittal of test results in meeting the same
specification requirements.

8-45.3.2.2.1 Certificate of Compliance
A manufacturer’s certificate of compliance must include:

1. Name of the manufacturer or of the supplier.
2. Name and use of the product.
3. Statement of the specification that the product meets, such as AASHTO and ASTM and the specification number, or when applicable, the contract special provisions. In some cases, it may be the manufacturer’s specifications.
4. Signature and job of a person in responsible charge of certifying the product who can bind the company and the signer’s job title.

An example of a correct certification of compliance is shown in Figure 1. Project staff should be reminded to, upon review, sign and date the certificate.

Figure 1 Example of Certificate of Compliance

8-45.3.2.2.2 Certified Report of Test or Analysis
A manufacturer’s certified report of test or analysis must include the following:
1. Name of the manufacturer or of the supplier.
2. Name and use of the product.
3. Statement of the specification that the product meets such as AASHTO and ASTM and the specification number, or when applicable, the contract special provisions. In some cases, it may be the manufacturer's specifications.
4. Lot, batch, heat numbers, etc., applicable to the material delivered.
5. Test results for both physical and chemical test requirements as specified.
6. Signature and title of a person in responsible charge of the testing facility.

An example of a correct certified report of test and analysis is shown in Figure 2. Certifications of compliance and certified reports of test and analysis must be provided to the project engineer for material to be accepted. All certifications must be evaluated promptly for adequacy, completeness, and compliance with applicable specifications. Include proper notations on all certificates.

**Figure 2  Example of Certified Report of Test and Analysis**

8-45.3.2.3 Buy America
Buy America certification is required for all steel and iron permanently incorporated into the project. CMM 2-28.5 provides additional guidance on the Buy America provision required by FHWA 23 CFR § 635.410.

8-45.3.2.4 Product Data
Product data sheets provide basic information on a material. It includes the material name, product definition, applicable uses of the product and in some cases model numbers.

8-45.3.2.5 Approved Product/Supplier/Manufacturer/Fabricator/Plant Lists
Some products are approved for use based on previous testing and a satisfactory performance history within the department. These products are on WisDOT's approved products list (APL).
The approved lists are maintained and updated regularly by the Bureau of Technical Services. Certain materials including, but not limited to; asphalt binder, Portland cement, prestressed concrete, precast concrete, fabricated components for bridges, guardrail, barrier systems, and proprietary retaining walls must come from a certified supplier, manufacturer or plant.

These materials may be accepted after project staff verifies that the products and suppliers are included in the appropriate approved list and inspection upon delivery. Document the material acceptance and relevant inspection information in the IDR and electronically in a MIT/MTS prefix 905 report. Reference any applicable test reports or certifications.

If products or materials from an approved list exhibit lower than expected performance when placed in service, or if project-level testing indicates non-conformance of an approved product with the relevant specification, field staff should immediately contact the technical sponsor identified on the applicable published list for that material.

8-45.3.2.6 Field Sampling and Testing

Some materials are sampled and tested onsite during production and placement. Others are sampled at the source or during placement and tested in a laboratory. All sampling and testing personnel must be qualified under a department-accepted program for the materials they are working with and testing is performed in qualified laboratories. Test types and frequencies are in accordance with the governing specification or the department recognized common practices. Sampling and testing procedures are performed as prescribed in CMM Chapter 8.

When the testing frequency of a material is determined by the quantity used, it is necessary to report the actual quantity used. When testing and subsequent acceptance requirements of a material do not depend upon quantity, it is necessary to provide detailed information within the remarks section of the applicable MIT/MTS report that will confirm that all of the materials incorporated into the work were thoroughly tested and within the specification requirements.

8-45.3.2.6.1 QC and QV Field Sampling and Testing (QMP)

Under WisDOT’s Quality Management Program (QMP) specifications, materials are approved based on the contractor’s quality control (QC) sampling and testing when they conform to specifications and when the results are validated by department quality verification (QV) sampling and testing. Contractor QC test results are reported in the materials reporting system (MRS). Department QV test results are documented in the appropriate MIT/MTS prefix report. QV testers must compare their test results to the appropriate QC test results to validate the material quality. Approval is based on acceptable QC and QV test results.

8-45.3.2.6.2 Central Office Laboratory Quality Assurance (QA) Testing

Some materials and products require testing by the department’s central office (CO). Acceptance of these materials are typically reserved pending satisfactory laboratory test results. Obtain representative samples of the materials from the job site or at the source of supply. Package and bind the material appropriately and securely attach an appropriate label that includes all pertinent or required information. Materials for CO laboratory testing are to be delivered to the region laboratory. Region Laboratory Coordinator will log and deliver to CO laboratory. Prompt submittal of properly bound and labeled samples will help ensure timely test results. Laboratory testers document the test results in the pertinent MIT/MTS prefix report(s). Test results are available to the project staff in MTS and in the Highway Quality Management System (HQMS) website.

8-45.3.2.7 Other Approval Methods

Other documents used to approve materials include but are not limited to:

1. Bill of Lading (BOL)
2. On-Site Material Photos
3. Shop Drawings
4. DT Forms
5. Shop/Plant Inspection Reports.

8-45.4 Material Inspection

All manufactured products, including conditionally approved products that have been previously inspected and tested at the source, must be inspected as soon as possible after delivery to the job site for any evidence of damage or noncompliance.

The project engineer should follow these steps as a minimum for inspection of all materials delivered to the project.

1. Inspect all manufactured and pre-qualified products as soon as possible after delivery.
2. Verify that products delivered match the certifications, approved lists, etc.

3. Review all certificates of compliance and certified reports of test and analysis. As part of the review process, assure the documents are dated within two years of the project LET date. Older documentation may be acceptable for raw hot-rolled materials, such as piling or black reinforcement steel; the contractor must furnish additional written verification from the source or mill validating the data on certifications older than two years. Project staff is encouraged to contact sources directly if verification cannot be obtained by other means.

4. Ensure that the manufacturer/supplier name, product name, and appropriate ASTM/AASHTO reference, and signature and title of the person certifying the product for the company is included. Reviewer initials and dates certificates. Refer to CMM 8-45.3.2.2 for additional details regarding approval by certification.

8-45.5 Documentation - General

Final material records and affiliated documents are compiled by project staff and retained according to state law. In the event of an early failure, product recall/evaluation, in-kind replacement, or fulfilment of an open records request, the department will reference this documentation.

8-45.5.1 Documentation - Records

Documentation and reporting for material acceptance is essential and required on all WisDOT projects.

The final material record documents are separated into two categories:

- Materials Project Records and
- Materials Archive

Attachment 1 (Materials Documentation Location Guide) defines if the item belongs in Materials Archive, Materials Project Records or has no documentation requirements.

8-45.5.1.1 Materials Project Records

Materials Project Records need to have all necessary documentation for the project staff to justify approval of the material for use. Any documentation project staff obtains or records on these materials should be kept in the construction field records (i.e., construction diary, electronic field file, separate hardcopy folder, etc.). These material records will be kept with the construction field records and will follow the same Highway Construction Project Records Retention/Disposition Authorization (RDA) for record retention. Materials Project Records are not reviewed by the Region’s Materials Unit and are not entered into the Materials Data Collection and Reporting Software System explained in CMM 8-46. All exceptions to the contract for these items are to be noted on Materials Project Records Deviation Log (DT1345) and not documented on Certification of Materials Report, form DT1310. Keep (DT1345) with Materials Project Records.

Source of Materials Report form (DT1349) should also be kept with the Materials Project Records.

8-45.5.1.2 Materials Archive

The Materials Archive requires entry in the Materials Data Collection and Reporting Software System (CMM 8-46), review of documents for compliance by Region Material Reviewer and completion of the Material Certification form (DT1310). Each contract is required to have an entry in a MIT/MTS prefix 905 report for each bid item or bid item group, including bid items in the contract at the time of letting or items added to the contract but not used; those items should be reflected in the individual entry as “Not Used.” The Materials Archive is maintained for long term storage per the Materials Management Program RDA. Note all exceptions to the contract requirements for Materials Archive items on the DT1310.

Documents in Materials Archive are to be submitted to the region in a clearly labeled box, folder, binder or electronic submission format.

At a minimum, the following items are to be included in the Material Archive:

1. Certification of Materials Report (DT1310)
2. WS4567 Buy America Certification
   a. Buy America Exemption Log (if used)
   b. Material invoices
4. E-Guide
5. QMP and Miscellaneous Summary Reports - MIT/MTS prefix 155 Report(s)
6. Approval Documents
7. QMP Documentation

8-45.5.1.2.1 Certification of Materials (23 CFR §637.207 (3)) – DT1310

The DT1310 or Certification of Materials is used to document all material deviations from contract specifications and is required for all LET contracts. The completed form is used for reference by FHWA and department staff that were not involved on the project. All nonconformance issues, nonperformance issues, and disincentives are documented individually in an entry on the DT1310 report. Also, any material logged under the allowable Buy America Exemption amount needs an entry on the DT1310.

This form is only available electronically in MIT/MTS software. The project engineer or WDMC enters information electronically in MIT/MTS and must ensure the latest version of the software is being used prior to sending the DT1310.

An example of an unsigned cover page of a DT1310 is shown in Figure 3.

**Figure 3 Example DT1310 - Certificate of Materials Report**

When entering deviations into a report, include detailed explanations by completing all the data fields, as shown in Figure 4. Also, be diligent in ensuring that the issue has not already been entered. The electronic DT1310 can be sorted by any of the columns to help ensure that data information isn’t duplicated. A DT1310 entry created by project staff cannot be deleted. If an entry is made in error, contact the region materials section for assistance.

The certification must be approved and signed by the project construction engineer or WPMC. Include a copy of the final, signed DT1310 in the material archive. After the region reviews the material records, the region material engineer/ reviewer and region project manager will sign the DT1310. For federal oversight projects, a signed copy of the DT1310 must be sent via email to FHWA at:

[Wisconsin.fhwa@dot.gov](mailto:Wisconsin.fhwa@dot.gov)
8-45.5.1.2.1.1 Non-Conformance Entry

There are different types of nonconformance entries:

1. Material not meeting testing specifications
   a. If material fails specification and is not incorporated into the work or is removed, an entry on the DT1310 is required.

2. Material not meeting test methods (ie: utilizing different ASTM or AASHTO method than specified)

If a credit is not applied to the nonconformance, the disposition description should include a sentence stating that a credit was not taken and title of who allowed the nonconforming material to remain without a credit.

If a credit is applied to the nonconformance, a DT1310 (found above in CMM 8-45.5.1.2.1) entry needs to include the basic information required in Figure 4, as well as:

1. Credit percentage/amount applied to the contract
2. Contract Modification number used to apply the credit
3. Standard Specifications or CMM reference used to apply the credit

8-45.5.1.2.1.2 Non-Performance Entry

Nonperformance of QMP is described in detail in CMM 8-30.13. All nonperformance of QMP by Quality Control (QC) or Quality Verification (QV) requires an entry in the DT1310 report. Each entry should have at a minimum the following information in the Disposition Explanation:

1. Description of Non-Performance (taken from the Non-Performance of QMP form, found in Statewide Pantry)
2. Description of problem encountered from CMM 8-30.13 Table 2 and include percentage deducted from bid item
3. Total Credit applied with written out calculation
4. Contract Modification number used to apply the credit

8-45.5.1.2.1.3 Disincentive Entry

Disincentives that are applied to an item require a DT1310 entry. A schedule of administrative items used to
assess disincentives is found in CMM 2-38.2.11 Table 1.

Disincentives calculated in the Highway Quality Management System (HQMS) should include:

1. Reference to the specific HQMS module and Lot/Sublot
2. Total disincentive applied
3. Contract Modification number used to apply the disincentive

Disincentives not reported in HQMS should include:

1. Lot/Sublot, station etc. where disincentive is applied
2. Test result(s)
3. Specification reference of disincentive amount
4. Percentage of disincentive
5. Total disincentive applied
6. Contract Modification number used to apply the disincentive

8-45.5.1.2.1.4 Buy America Exception Entry

Buy America exemptions are allowed per the Buy America provision in the contract. Additional information on Buy America can be found in CMM 2-28.5. If a project utilizes any part of the exemption amount, an entry in the DT1310 report is required. The entry needs to list:

1. Material being exempted
2. Amount being logged under exemption
3. Allowable exemption amount

An example entry is shown in Figure 5.

8-45.5.1.2.2 Buy America WS4567 Certification

Buy America certification form WS4567 (BuyAmericaCertWs4567.dotm) and the Buy America Exemption Log (BuyAmericaExemption.xls) can be found online in the statewide pantry at:

https://awpkb.dot.wi.gov/Content/constr/Pantry/StatewideForms.htm

Any material that is logged under the allowable Buy America Exemption needs to be accompanied by material invoices showing the cost of the material as it is delivered to the project.
Additional information on Buy America is located in CMM 8-45.3.2.3.

Buy America exemptions need to be logged on the DT1310 according to CMM 8-45.5.1.2.1.

8-45.5.1.2.3 Materials Diary – MIT/MTS Prefix 905 Report

A diary entry must be made in a MIT/MTS prefix 905 Materials Diary Inspection report for every material required in the material archive. Materials Diary Inspection entries are made to document visual field inspections, test results, and to reference all external materials approval documents described in CMM 8-45.3.2.

CMM 8-45.4 provides a list of inspection steps that should be performed on all materials delivered to a project. When performing the material inspection, document in the MIT/MTS prefix 905 report basis for acceptance (BFA) what was physically done to approve the material for use. Some examples include: verified steel certification heat numbers with tags on rebar or confirmed source of base aggregate stockpile by visiting the pit/quarry.

Diary entries must include the following:

- Description: brand, model, type, system, species, markings, size, dimensions, lot/batch, heat number, application rate, etc.
- Quantity.
- Manufacturer, source and vendor.
- Evaluation and basis for acceptance - visual inspection remarks, product condition, compliance to specifications, etc.

An example of the format for diary entries is shown in Table 1. Several similar materials may be included on a single report entry when appropriate.

Note: In special cases, when field inspection is specifically requested by the Bureau of Structures, Bridge Fabrication Unit, a copy of the report must be sent to them immediately after inspection. Copies of all reports of field inspection of material must be included with the Test Report Record when the project is completed.
Table 1  Example of Materials Diary Inspection Entries

<table>
<thead>
<tr>
<th>Date of Inspection</th>
<th>Bid Item Description</th>
<th>Product Name</th>
<th>Manufacturer Name / Location</th>
<th>Evaluation / Basis for Acceptance (BFA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/11/2006</td>
<td>Tack Coat</td>
<td>CSS-1H</td>
<td>Koch- Dubuque</td>
<td>Type acceptable per specifications. Asphalt Emulsion for tack coat, diluted with 50% water. Application Rate - 0.07 Gals/SY on milled surface and 0.05 Gals/SY on paved surface. 455.0600b: Bill of Lading</td>
</tr>
<tr>
<td>3/12/2006</td>
<td>St Sewer Pipe Reinf Conc Class III xx-Inch - PIPE</td>
<td>18&quot; / 24&quot; / 36&quot;</td>
<td>County Materials Corp Marathon, WI</td>
<td>Pipe was new and undamaged. Pipe Markings: CMC M170 C-76 Dated 5/23/05</td>
</tr>
<tr>
<td>4/1/2006</td>
<td>Bar Couplers - THREADED BAR COUPLER</td>
<td>No 8</td>
<td>Nucor Steel Charlotte, NC</td>
<td>No. 8 Lot #154449 (Heat #MM16106574, MM17103616) Supplier: Dayton Superior Corp., Allentown, PA. Fabricator: Plymouth Tube Co., Winamac, IN. Conforms to Standard Specifications section 505 and exceeds 125% of the yield strength of the grade 60 bar steel being spliced. See DT1310 for acceptance based on 2 tests/type instead of 3 tests. All lot/heat numbers recorded in the field match mill test reports/shipping documents.</td>
</tr>
<tr>
<td>4/1/2006</td>
<td>Bar Couplers – EPOXY</td>
<td>Greenbar 720A009</td>
<td>Valspar Corp Charlotte, NC</td>
<td>Batch #: 7V96026105 (Lot #15449), 7V96026237 (Lot #158012.) Coated by B.L. Downey Co., Broadview, IL. Satisfactory visual inspection of coating not being damaged. Conforms to Standard Specifications section 505 and meets ASTM A775. Epoxy batch numbers accounted for and correspond with all steel coupler lot/heat numbers.</td>
</tr>
<tr>
<td>3/30/2006</td>
<td>Structural Steel HS – HIGH STRENGTH BOLTS</td>
<td>7/8&quot; HS Bolts</td>
<td>CMC Steel SC Cayce, SC</td>
<td>Heat No: 7501468 Fabricated by Veritas Steel, Wausau, WI Galvanized by: Rodgers Brothers, Rockford IL – Type A325, Lot 4321 Supplied by: Uny-Tite Fastners Fort Bolt, MO</td>
</tr>
</tbody>
</table>

8-45.5.1.2.4 QMP and Miscellaneous Summary Reports – MIT/MTS Prefix 155 Report(s)
Prefix 155 reports, titled Miscellaneous Materials, are used to report activities and test results that aren’t covered by other standard prefix-numbered reports. A prefix 155 is also used for QMP Summary reports to summarize all QMP activities that were performed for each individual QMP specification involved in a project. Department personnel should create a 155 report in MIT or MTS by using an appropriate QMP summary template(s).

QMP Summary templates are available for most QMP specifications to help standardize reporting and to ensure that all relevant information is captured. QMP Summary templates can be accessed by all department personnel in pantry under WisDOT Statewide Forms.
Due to the format of the QMP Summary templates, more than one QMP summary report may be required for a certain QMP specification. For example, the QMP Base Aggregate special provision requires a QMP Summary for each nominal aggregate size; 3/4”, 1-1/4”, and 3”.

Examples of individual QMP summaries can be found in the online pantry under QMP form templates, located at:

https://awpkb.dot.wi.gov/Content/constr/Pantry/StatewideForms.htm

8-45.5.1.2.5 Approved Documents
All approval documents are to be assigned a document ID and recorded in MIT/MTS prefix 905 report under the appropriate material diary entry. See CMM 8-45.3 for types and descriptions of approval documents.

8-45.5.1.2.6 QMP Documentation
All required QMP documentation needs to be included in the material archive. The individual specification or special provision will state the required documents. Ensure that source documents are also included in the QMP records.

List of Attachments
Attachment 1 Material Documentation Location Guide