

Material Certification Process

CONTRACT ADMINISTRATION MANUAL

5-591.430

Control of Materials

Control of materials is a necessary and important part of every construction project. The intent is to assure that only quality (specification) materials are incorporated into the work.

Quality Assurance (QA)

BACKGROUND

The Code of Federal Regulations (23 CFR 637) states that State DOT's shall develop a Quality Assurance Program which will assure that the materials and workmanship incorporated into each Federal-aid highway construction project on the NHS are in conformity with the requirements of the approved plans and specifications, including approved changes. The program must meet the criteria in § 637.207 and be approved by the FHWA.

The Mn/DOT QA Program consists of planned and systematic actions necessary to provide confidence that a product or service provided by a highway construction contractor or a construction product vendor meets Mn/DOT's requirements for quality.

The QA Program consists of three parts:

1. Acceptance Program
2. [Independent Assurance Program](#), and
3. [Materials Certification](#).

Each of the three major parts of the Mn/DOT QA Program include several specific components as listed below:

Acceptance Program	Acceptance/Assurance/Verification Sampling and Testing Quality Control (QC) Testing (Certified Plants) Small Quantity Acceptance Schedule of Materials Control Qualified Laboratories (Central, District, and Field) AMRL Laboratory Accreditation Plant Monitoring Certified Plants Technician Certification Equipment Calibration Approved Products Pre-Cast Plant Inspection Dispute Resolution
IA	Independent Assurance Inspector (IAI) Evaluations and Reviews Schedule of IA Sampling and Testing Laboratory Companion Samples (from Schedule of Materials Control)

Proficiency Samples (Round Robins)

Materials Certification	Project Materials Certification (Current Tech Memo) OM Annual Project Compliance Reviews State Aid Division Project Audits/Reviews
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The following describes the process for the Materials Certification part of the QA Program.

DEFINITIONS

Acceptance Program All factors that comprise Mn/DOT's determination of the quality of products as specified in the contract requirements. These factors include verification sampling, testing, and inspection and may include results of QC sampling and testing.

AMRL AASHTO Materials Reference Laboratory.

Approved Products Products that can be accepted based upon a manufacturer's representation that a product complies with all contract requirements, usually identified by a product name. Common examples are concrete admixtures, joint sealers, raised pavement markers, and sign sheeting.

Certified Products Products that can be accepted based upon a manufacturer's certificate of compliance. Certified products are sometimes referred to as from "certified sources" or "approved manufacturers." Common examples are asphalt, cement, fly ash, paint, and seed.

Field sampling and testing Acceptance tests identified in the *Schedule of Materials Control* as "Field Tests," taken and performed by a Mn/DOT representative. Field tests are commonly run in the field or in a field laboratory, but may be run at any qualified laboratory.

Independent Assurance (IA) Program Activities that are an unbiased and independent evaluation of all the sampling and testing procedures used in the Acceptance Program. The program covers sampling procedures, testing procedures, and testing equipment, and is defined in the *Schedule of Independent Assurance Sampling and Testing*.

Laboratory testing or field companion testing Tests performed by a Mn/DOT District or central laboratory on a companion sample to the field test, as identified in the "Schedule of Materials Control." Testing is not to be performed by the same person and/or equipment as the field test.

Materials Certification A process that provides reasonable assurance that all aspects of the Acceptance Program have been satisfactorily completed and that the materials incorporated are in close conformance to the contract specifications.

OM The Office of Materials includes the Geotechnical Engineering Section, the Materials Engineering Section, and the Pavement Engineering Section. The Pavement Engineering Section contains the Bituminous and Concrete Units. The Geotechnical Engineering Section contains the

Grading and Base Unit. These units are traditionally referred to as the “specialty offices.”

Proficiency samples Homogeneous samples that are distributed and tested by two or more laboratories. The test results are compared to ensure that the laboratories are obtaining the same results. Commonly, two homogenous samples are created by splitting a larger sample and are called “companion samples.”

Quality assurance (QA) testing or quality control (QC) companion testing Testing performed by a Mn/DOT representative on companion samples to the contractor or vendor’s QC samples.

Quality control (QC) sampling and testing Testing performed by the contractor on samples taken by the contractor for process control which is used as a part of the acceptance decision as defined by the “Schedule of Materials Control.” Also known process control testing. A Mn/DOT representative is required to observe a minimum number of some types of QC samples and tests.

Qualified laboratories Laboratories that are capable as defined by appropriate Mn/DOT programs. As a minimum, each laboratory has a program for checking test equipment and the laboratory keeps records of calibration checks. Qualified sampling and testing personnel are used whenever performing acceptance tests for Mn/DOT or Federal-aid projects.

Qualified sampling and testing personnel Personnel who are certified by the Technical Certification Program for tests they perform.

Verification companion testing Testing performed by the contractor or vendor on a companion to Mn/DOT’s verification sample. These test results are required to be used in the contractor or vendor’s QC program.

Verification sampling and testing Sampling and testing which is performed by a Mn/DOT representative, excluding the contractor and vendor, on samples taken by a Mn/DOT representative independently of the QC samples and which is used as a part of the acceptance decision to validate the quality of the material which is being accepted based upon QC testing.

MATERIALS CERTIFICATION PROCESS

This process for Materials Certification applies to all Mn/DOT (including Mn/DOT consultants) construction and maintenance contract projects whether or not federal funding is involved. Projects administered by local agencies shall follow the process required by the State Aid Division.

Acceptance Program

The Acceptance Program is used to verify material quality as materials are incorporated into a project, accepted, and paid for.

Field Documentation

Document exceptions to the Acceptance Program requirements and corresponding resolutions in real-time.

Record exceptions and resolutions on form TP-02171-04 and/or document exceptions and resolutions by Supplemental Agreement, Change Order, or Backsheet Item. The Project Engineer will consult with and request input from the District Materials Engineer and the appropriate Specialty Offices. Both the Project Engineer and the District Materials Engineer sign form TP-02171-04 to indicate that they have had the opportunity to provide input. Specialty Offices provide input to form TP-02171-04 or provide separate documentation that allows the Project Engineer to complete the form.

Prior to the Project Engineer signing the Final Estimate and sending it to the Contractor for signature, form TP-02171-04 should be completed and all exceptions resolved. When the Engineer signs the Final Voucher to send to the Contractor the project is certified. Enter this date on the Final Voucher Date Tracking Form.

The Office of Materials will review the content of the form for its own information and to provide feedback to District personnel.

The following are EXCEPTIONS:

Failing Tests	Any failure of an acceptance test, (field test, QC test, or verification companion test.) List corrections or deducts resulting from failing tests as resolutions.
Missing Tests	Any missed test: field, QC, or verification test, including required observations of QC tests. Metro Inspection staff shortage = missing verification test.
Test Tolerance	Any tolerance failure between an acceptance test and the corresponding companion proficiency or IA sample test. Companion sample tests are performed between: <ul style="list-style-type: none"> • Field and Laboratory samples • QC and QA samples • Verification and verification companion samples • Field and IA samples • QC and IA samples • Plant observer's QA or verification samples and IA samples

If an acceptance test passes and the companion proficiency or IA sample fails, but is within the allowed tolerance, there is no exception to be documented.

Non-Certified Testers	Any acceptance samples taken or tests performed by non-certified
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or under-certified testers. This includes Contractor QC tests when used for acceptance and agency verification tests. Tests not performed in a qualified laboratory are also exceptions.

Other Exceptions Material accepted from a non-approved source, missing certificates of compliance, etc.

Paving without a Mixture Design Report/Recommendation is an Exception.

Exception Clarifications IA test fails and is out of tolerance is an Exception.

Individual test out of tolerance, but moving average within limits is an Exception for individual test out of tolerance.

Bituminous test results in the warning band (year 2000 and older specifications) is an Exception, reduce payment in accordance with specifications.

The following are Not Exceptions:

Low concrete cylinder strength. (Unless cylinder strength is specified on that project.)

Field QC test passes, lab QA test fails and the tests are within tolerance.

IA test fails and is within tolerance of a passing field test.

QA test does not meet JMF/broadband requirements, QC test meets requirements and the tests are within tolerance.

Out of tolerance test on Bituminous summary sheet, with a retest that is within tolerance.

Bituminous gradation tests outside the current Mixture Design Report/JMF but within the requested mix adjustment. Not an exception if the requested mix adjustment is approved. When the request is approved, it should be considered effective from the time it was made and noted on the daily summary sheet.

Missed IA tests. Not an exception that must be listed on the Materials Certification Exception summary Form. However, Mn/DOT must provide an Annual IA Report to the Federal Highway Administration that lists the number of missed IA tests. The District

Materials Engineer is responsible for tracking the number of missed IA tests and reporting that number annually to the Pavement Engineer for compilation into the Mn/DOT annual report to the FHWA. The latest version of the Exceptions Summary Form has check boxes to assist with the tracking of IA activities.

Resolutions are required for all exceptions recorded on form TP-02171-04. Resolutions can be brief, but must describe the action taken or the rationale for taking no action. Retain supporting documentation in the project file.

Examples of actions taken as resolutions may include

- deduction per specification applied, or
- \$ per unit deduct applied, or
- mix change made and testing rate increased, or
- testing equipment recalibrated, test rerun and passed, or
- Area re-watered and re-compacted, test rerun and passed, etc.

Resolutions may also result in no actions having been taken; an acceptable resolution when accompanied by appropriate rationale.

- Substantial compliance, or
- in close conformity, or
- materials incorporated in-place performing satisfactory

can be used as resolutions in these situations. Use only for a minor test failure or the omission of a few out of many required tests. Include rationale for taking no action on the form.

All questions concerning the Material Certification Process should be directed to the appropriate specialty office in the Maplewood Central Lab or to your own District Materials Office.

Materials Certification Exception Summary

Materials Certification applies to the Acceptance Program activities only. The Project Engineer will verify that the Acceptance Program was complied with and that exceptions are appropriately resolved and documented in the project file. By signing the Materials Certification Exception Summary, the Project Engineer is certifying that all aspects of the Acceptance Program have been properly completed:

1. All materials incorporated into the project conformed with the Contract.
2. The required number of observations were made and/or samples taken, tested, and compared to companion sample test results (where applicable) in conformance with testing rates listed in the "Schedule of Materials Control" and project special provisions.
3. All Mn/DOT and Contractor project personnel performing acceptance testing were

certified at the appropriate level for the tests performed. All acceptance tests not performed by project personnel were performed by a qualified laboratory or by Mn/DOT central or plant inspection.

4. All acceptance samples taken and tested as a companion to an IA sample were within tolerance limits of the IA companion samples.
5. Any exceptions and resolutions to items 1-4 have been documented and appropriate corrective measures have been taken. Form TP-02171-04 has been completed.

Project Compliance Reviews

The Pavement and Geotechnical Engineering Sections of OM and by other specialty offices such as Agriculture, Materials/Metals, and Chemical may conduct Project Compliance Reviews (PCR). The Federal Single Audit is a separate process conducted independently by the Mn/DOT Auditor's office.

A committee from the Office of Materials will annually select projects from within various categories to review for compliance with the requirements of the Materials Certification process.

Results of Review, including irregularities and areas of outstanding performance will be reported back to the Project Engineer and District/Metro Materials Engineer. The Project Engineer, with the cooperation of the District/Metro Materials Engineer, will address, and if possible correct, all irregularities. The Assistant District/Metro Engineer will receive a copy of the District/Metro results and the Project Engineer's explanations.

The Pavement Engineer may delegate review responsibility to the District/Metro Materials Engineer and reduce or eliminate reviews performed by the Office of Materials if the Districts or Metro perform in-house review processes that meet the requirements of the Pavement Section for compliance reviews,

The Office of Materials will compile the results of the Project Compliance Reviews performed by the various specialty offices, and the audit results from the Mn/DOT Auditor's Office; and will summarize and evaluate the results for needed improvements to the QA Program.

Independent Assurance (IA)

The District/Metro Materials Engineer is responsible for making sure all IA activities are completed, tracked, and reported on the form. The District Materials Engineer is responsible for annually reporting the IA activities to the Mn/DOT Pavement Engineer independently of the Materials Certification process.

QUESTIONS

If you have questions concerning Materials Certification contact the Materials Office at (651) 366-5592.

Material Certification Process CONTRACT ADMINISTRATION MANUAL

MATERIALS CERTIFICATION EXCEPTIONS SUMMARY FORM TP-02171-04

MATERIALS CERTIFICATION EXCEPTIONS SUMMARY

S.P. No. 3708-13 Contract No. S04059 Project Desc.: BIT OVERLAY, AGGREGATE SHOULDERING, AND CULVERT LINERS Constl. Year: _____

District 08 Contractor: Central Specialties, Inc Project Location: LOCATED ON TH 40 FROM THE SOUTH DAKOTA STATE LINE TO TH 75, IN MADISON

Project Engineer/Supervisor: Stoutland, Jim Federal No. _____ STATE FUNDS _____ Page _____ of _____

Materials and products used on project:

Grading and Base Bituminous Concrete Aggregate Materials/Chemicals

Specialty	Exception Description	Resolution	Document Reference	Init.

Dist./Metro Materials Engineer _____ Date _____ Project Engineer _____ Date _____

ATTACH SUMMARY REPORTS OF SUPPLEMENTAL AGREEMENTS, CHANGE ORDERS, and BACKSHEET ITEM EXCEPTIONS.

No Independent Assurance Required
 Independent Assurance Required
 Independent Assurance Completed Without Exceptions
 Independent Assurance Completed With Exceptions

Information regarding Independent Assurance is available in the District I.A. or Project Engineer Files
 Original: Retain in Project File Copy: State Materials Testing Engineer - MS 645
 Copy: Financial Operations Section - MS 215 Copy: District Materials Engineer
 Copy: Office of Construction - MS 650



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To: All Construction Resident Engineers;
Project Engineers; Project Supervisors;
Project Personnel; Consultants

Date: 08/27/07

From: Dave Van Deusen
Metro District Materials Engineer
Waters Edge Bldg.
(651)234-7350

Tim Sinclair
Pavement Mgt. / IAI Supervisor
Waters Edge Bldg.
(651)234-7354

Subject: Materials Certification Process;

It has come to our attention that with the many new faces in Mn/DOT over the past few years, and with an increased use of Consultants in Project Administration, we need to clarify the Final Materials Certification process and the required supporting information needed to get approval. The goal here is to better help you understand the Materials Certification Exception Summary Form, and create a package for submittal that is simple and complete. This will also expedite the Exception Form through the certification process. This memo is meant to be a **quick summary guide** of the Manual's *detailed* process, and is **not** meant to replace it, please consult the Contract Administration Manual for in-depth explanations and Exception Clarifications. The website can be found at: <http://www.dot.state.mn.us/const/tools/conadminmanual.html>. We are still operating off the process defined in the Contract Administration Manual last updated April 15, 2005; under "Documentation of pay Item Quantities" (5-591.410).

This process for Materials Certification applies to all Mn/DOT (including Mn/DOT Consultants) Construction and Maintenance Contract projects, whether or not Federal-Aid funding is involved. Projects administered by local agencies shall follow the process required by the State Aid Division, which has elected to follow the Standard Certification process in Federal-Aid projects as explained above, unless the project is funded by 100% state-aid or local funds (no Federal aid), in which case the IAST schedule does not apply. Please contact The Independent Assurance office or State Aid Office if you are unsure if the project status is subject to State Aid requirements.

BACKGROUND;

Federal requirement (23 CFR 637) states that for all Federal-Aid highway projects, State DOT's have a Quality Assurance/Acceptance Program in place to insure compliance. The Mn/DOT Quality Assurance Program consists of all those planned and systematic actions necessary to provide confidence that the product or service provided by a highway construction contractor, personnel, or construction product vendor meets Mn/DOT's requirements for quality.

The Quality Assurance Program consists of three parts:

1. **Acceptance Program** (QC/QA program, Technician, lab, Plant, and Equipment Certifications, approved products, Schedule of Materials Control).
2. **Independent Assurance Program** (Inspector evaluations and reviews, calibrations, Laboratory companion and proficiency samples, project Tech help).
3. **Materials Certification** (Project Materials Certification-current tech memo, Maplewood Office of Materials Annual Project Compliance Reviews, State Aid Project Audits/Reviews).

MATERIALS CERTIFICATION PROCESS

Field Documentation

The Acceptance Program is used to verify material quality as materials are incorporated into a project, accepted, and paid for. Whenever exceptions to the Acceptance Program requirements occur, those exceptions and corresponding resolutions **must** be documented.

During the course of the project, and prior to or at the time of Final Acceptance of Work (Mn/DOT Spec 1516.2), The Project Engineer will record exceptions and resolutions on form TP-02171-04 (Materials Certification Exception Summary) and/or document exceptions and resolutions by Supplemental Agreement, Change Order, or Back sheet Items. The Project Engineer will consult with and request input from the appropriate Specialty Offices, or District Materials Engineer. Both the Project Engineer and District Materials Engineer sign form TP-02171-04 to indicate that they have had the *opportunity* to review the project during construction, and provide input. The Specialty Offices may provide direct input to form TP-02171-04, or they will provide **separate documentation** (Metro Inspection Fax Letters) that allows the Project Engineer to complete the form. At the time of final acceptance of work, form TP-02171-04 **must** be completed and **all** exceptions resolved.

If form TP-02171-04 is not submitted correctly, or if all exceptions and resolutions have not been accounted for, The Office of Construction and Contract Administration will delay submittal of the Final Payment Voucher and may not certify the Project.

All exceptions to the Acceptance Program requirements must be recorded on form TP-02171-04, or listed on the Summary Report of supplemental agreements, change orders, and back sheet items attached to form TP-02171-04.

The following are job **EXCEPTIONS**:

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|-----------------------|---|
| Failing Tests | Any failure of an acceptance test- meaning a field test, quality control test, or verification companion test. Corrections or deductions resulting from failing tests must be listed as resolutions of exceptions. |
| Missing Tests | Any missed field test, quality control test, or verification test. Tests include required observations of quality control tests.
NEW: Metro Inspection Staff shortage = Missing verification test. |
| Test Tolerance | Any tolerance failure between an acceptance test and the corresponding companion proficiency or Independent Assurance sample test. Companion sample tests are performed between: <ul style="list-style-type: none"> • Field and Laboratory samples • Quality control and Quality assurance samples • Verification and verification companion samples • Field and Independent Assurance samples • Quality control and Independent Assurance samples • Plant monitor's quality assurance or verification samples and IA samples |

Note; when an acceptance test passes and the companion proficiency or Independent Assurance sample fails, but is *within* the allowed tolerance, there is **no** exception that has to be documented.

Non-Certified Testers Any acceptance samples taken or tests performed by non-certified or

under-certified testers. This includes contractor quality control tests when used for acceptance and Agency verification tests. Tests not performed in a **qualified** (certified) laboratory or field testing lab.

Other Exceptions Material accepted from a non-approved source, missing Certificates of Compliance, etc. Paving without a approved Mix Design Report or Recommendation = Exception.
Independent Assurance tests fails **and** is out of tolerance = Exception
Mix or paving out of a Non-Certified plant =Exception

The following are **NOT Exceptions**:

- Field QC test passes, lab QA test fails, and the tests are **within** field/lab tolerance.
- Independent Assurance test fails, but is *within* tolerance of the passing field test.
- Low concrete cylinder strength break. This is not an exception unless cylinder strength is specified on that project. Any pattern of bad breaks should send up a red flag to be investigated.

This is a Partial list of the most common non-exceptions; consult The Contract Administration Manual and/or the Spec book for a complete list.

RESOLUTIONS:

Resolutions are required for **all** exceptions recorded on form TP-02171-04. Resolutions can be brief, but must describe the action taken or the rationale for taking no action. Supporting documentation should be contained in the file and list the document reference in the appropriate column. Examples of actions taken as resolutions may include “standard deduction applied”, or “\$ per unit deducted applied”, or “mix rate changed and testing rate increased”, or “testing equipment recalibrated, test rerun and passed”, or “area re-watered and re-compacted, test rerun and passed” etc.

Resolutions may also result in no actions having been taken. This is an acceptable resolution when accompanied by appropriate rationale. Often, “substantial compliance” or “Materials incorporated in-place performing satisfactory”, or “in close conformity” will be used for resolutions in these situations. Generally these resolutions should *only* be used for a **minor** test failure or the omission of a **few** out of many required tests. Rationale for taking no action **must** be included on the form.

Final Materials Certification Summary form (TP-02171-04)

It is the responsibility of the Project Engineer to verify that all aspects of the Acceptance Program were complied with and that any exceptions are appropriately resolved, and corrective measures and/or monetary deductions have been taken and duly documented on the form. By signing the Materials Certification Summary form in the lower **right** hand part of the sheet, the Project Engineer is certifying that all aspects of the project have been properly completed.

The District/Metro Materials Engineer is responsible for making sure all Independent Assurance activities are completed, tracked, and reported on the form in the lower **left** hand corner. The District/Metro Materials Engineer

IAI is responsible for checking the appropriate box in the lower left hand corner of the form, not the Project Engineer. The Independent Assurance check is reported annually and is *separate* from the Materials Certification Process. It is an unbiased and independent evaluation of all the sampling and testing procedures used in the Acceptance Program, and aids the Project Engineer in assuring overall Project compliance.

The following paperwork **MUST** be attached and included in the overall Packet to expedite form TP-02171-04 through the process: Any errors, missing faxes, rosters, back sheet items, Change orders, etc. will delay the process by having to return the form back to the Project Engineer for the required paperwork and/or corrections.

- Materials Certification form (TP-02171-04) completely filled out, all Material Specialty items used on Project listed, and any Exception Descriptions and subsequent Resolutions correctly accounted for.
- Materials Certification form (TP-02171-04) **Signed in ink** by the Project Engineer in the lower right hand corner. (Do not check boxes in the lower left hand of the form).
- Project Technician Roster listing **ONLY** the technicians/testers/samplers that actually did physical testing on the project (Density, DCP, Gradations, Air, Slump Cylinders, etc.) Do not list visual inspectors or personnel involved in checking finals/office personnel.
- If *Metro Inspection* was used on the project, include the Faxes from Concrete (Dick Kasa) or Bituminous (Deb Evans). The Fax from Metro Inspection office confirms they have reviewed their files for any Materials exceptions (Plant & Lab-they could have additional Exceptions you are not aware of.) on the listed projects, have consulted the proper Specialty office and have recommended the appropriate Resolution if any. If another Agency or Consultant lab did the QA work, include test results and their review/report/ and recommendation of the project and any action that should be taken.
- Any Supplemental Agreements, Change Orders, or Back Sheet Item Exceptions.

With all the required information included or attached, the Exception Summary form then begins the process for final Certification. Independent Assurance will review their Project records and lab reports, and check sample IAI/ Field/Lab tolerances. If an IAI missing, failing, uncertified, or test tolerance Exception is found; it, along with the lab reports, will be sent back to the Project Engineer to be included on the Exception Form, along with the suitable Resolution from the Engineer.

If after reviewing the Exception Summary form all is found correct, IAI then checks the appropriate box in the lower left hand corner of the form, initials and dates it, and then sends it on the District/Metro Materials Engineer. Who after review, either signs and returns the form/packet to the Project Engineer for final processing, or can elect to return it unsigned for incomplete paperwork or improper/missing Resolutions to Exceptions.

Hopefully this Memo will help assist you through the sometimes confusing process of Materials Certification, and will help to speed the procedure along correctly. Please try to remember the purpose of this method is to provide *reasonable* assurance that all aspects of the Acceptance program have been satisfactorily completed and that the materials incorporated are in close conformance to the Contract Specifications.

If you have any questions to this Memo, please feel free to contact either Dave VanDeusen, Metro District Materials Engineer @ (651) 234-7350, or Tim Sinclair Pavement Management/IAI @ (651) 234-7354