

**MINNESOTA DEPARTMENT OF TRANSPORTATION  
STATE AID FOR LOCAL TRANSPORTATION GROUP**

**Technical Memorandum No. 02-SA-01**

**April 4, 2002**

**TO:** County Engineers  
City Engineers  
Consulting Engineers  
District State Aid Engineers  
District Materials Engineers

**FROM:** Julie Skallman  
State Aid Engineer

**SUBJECT:** Process for Certification of Materials on State Aid and Federal Aid Projects.

**EXPIRATION**

This Technical Memorandum supercedes Technical Memorandum No. 00-SA-03. This Technical Memorandum will remain in effect until superseded or placed in the State Aid Manual.

**PURPOSE:**

This Technical Memorandum sets forth the process for certifying the quality of materials used in local federal and state aid contracts. This Memorandum differs from Technical Memorandum 00-SA-03 in that it contains some revised terminology and definitions, has the latest version of the Exception Summary Form attached, and requires a summary report of change orders, supplemental agreements, and backsheet items. This memo also contains the certification requirements for state aid funded projects.

This process for Materials Certification applies to all cities and counties (including city and county consultants) construction and maintenance contract projects where federal funding is involved.

State Aid Funded Projects:

For projects using state-aid funds (no federal-aid) the following requirements apply:

- Inspection and testing must be in conformance with the most current Schedule of Materials Control, by personnel having appropriate Technical Certification,
- Compliance with these requirements certified by the City/County Engineer on the Payment Request form.

The State Aid Group will do annual reviews of a small sampling of projects for conformance with these requirements. Results of such reviews are used by the State Aid Group, cities, counties, and training personnel, for self-improvement and to guide state aid policy.

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A separate form documenting exceptions is not required, however, it is expected that exceptions will be properly resolved and supporting documentation placed in the agency's project file. Also, the Independent Assurance Schedule does not apply to state-aid funded projects. For more information on state-aid projects, refer to the State Aid Manual

**BACKGROUND:**

The Quality Assurance Program consists of all those 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 the requirements for quality.

The Quality Assurance Program consists of three parts, the Acceptance Program, the Independent Assurance Program, and Materials Certification. Each of the three major parts of the Quality Assurance Program include several specific components as listed below:

- |                         |  |
|-------------------------|--|
| Acceptance Program      | Acceptance/Assurance/Verification Sampling and Testing<br>Quality Control Testing (Certified Plants)<br>Small Quantity Acceptance<br>Schedule of Materials Control<br>Qualified Laboratories (Central, District, and Field)<br>AMRL Laboratory Accreditation<br>Plant Monitoring<br>Certified Plants<br>Technician Certification<br>Equipment Calibration<br>Approved Products<br>Pre-Cast Plant Inspection<br>Dispute resolutions |
| Independent Assurance   | Independent Assurance Inspector (IAI)<br>Evaluations and Reviews<br>Schedule of Independent Assurance Sampling and Testing<br>Laboratory Companion Samples (from Schedule of Materials Control)<br>Proficiency Samples (Round Robins)  |
| Materials Certification | Project Materials Certification (Current Tech Memo)<br>Annual "OMRR" Project Compliance Reviews  |

This State Aid Technical Memorandum describes the process for the Materials Certification part of the Quality Assurance Program.

## DEFINITIONS:

**Acceptance Program.** All factors that comprise the 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 quality control sampling and testing.

**AMRL.** AASHTO Materials Reference Laboratory.

**Approved Products.** Products which 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, which 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 county or city 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 county, city, district or central laboratory on a companion sample to the field test, as identified in the *Schedule of Materials Control*. 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.

**OMRR.** The Office of Materials and Road Research which, among other sections, includes the Materials Section and the Pavement Engineering Section. The Pavement Engineering Section contains the Grading and Base, Bituminous, and Concrete Units, traditionally referred to as the 'specialty offices.'

**Project Engineer.** The County or City Engineer, or other registered professional engineer, delegated by the County or City Engineer to have responsible charge of the project.

**Proficiency samples.** Homogeneous samples that are distributed and tested by two or more laboratories. The test results are compared to assure 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 testing or quality control companion testing.** Testing performed by the county or city on companion samples to the contractor or vendor ' s quality control samples. Also known as QA testing.

**Quality control sampling and testing.** Testing performed by the contractor on samples taken by the contractor for process control that is used as a part of the acceptance decision as defined by the *Schedule of Materials Control*. Also known as QC testing or process control testing. A county or city representative is required to observe a minimum number of some types of quality control 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 counties and cities on Federal-aid or state aid projects.

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

**SALT.** The Minnesota Department of Transportation ' s State Aid for Local Transportation Group.

**Verification companion testing.** Testing performed by the contractor or vendor on a companion to the county or city verification sample. These test results are required to be used in the contractor or vendor ' s quality control program.

**Verification sampling and testing.** Sampling and testing which is performed by the county or city on samples taken by the county or city personnel independently of the quality control 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 quality control testing.

## **IMPLEMENTATION:**

The general procedure described in the previous Technical Memorandum became effective in March of 2000. This Technical Memorandum is effective immediately.

The changes are:

- 1) Additional definitions of Exceptions and Non Exceptions
- 2) Revised MATERIALS CERTIFICATION EXCEPTIONS SUMMARY FORM TP-02171-04
- 3) Requirement for Summary Report of Supplemental Agreements, Change Orders and Backsheet Items that Address Exceptions.

## **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 are 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 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. At the time of Final Acceptance of Work, form TP-02171-04 should be completed and all exceptions resolved.

For traditional federal-aid projects, as per procedures issued by the Office of Construction and Contract Administration, after Final Acceptance of Work on traditional Federal-Aid projects, the Project Engineer submits the Finals package to the Office of Construction and Contract Administration for the quantity documentation audit. Form TP-02171-04 is one of the required components of the Finals package.

If form TP-02171-04 is not included, the Office of Construction and Contract Administration will contact the District and request form TP-02171-04 and delay submittal of the Final Voucher until it is submitted. If form TP-02171-04 is present, and upon completion of other required activities, the Office of Construction and Contract Administration will send the Final Voucher to the Project Engineer for signature. When the Project Engineer signs the Final Voucher, the project is certified.

The Office of Construction and Contract Administration need not review the content of form TP-02171-04 to complete the certification. The Office of Materials and Road Research will review the content of the form for its own information and to provide feedback to District personnel. **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 Backsheet Items attached to form TP-02171-04.**

On Delegated Contract Process Projects (DCP's) there are no Finals packages submitted to Mn/DOT's Office of Construction and Contract Administration for a quantity documentation review. Therefore, the Project Engineer on a DCP project must maintain the completed Form TP-02171-04 in the project file and submit a copy to the District State Aid Engineer. The Materials Certification instrument on DCP projects will be the "Report of Final Estimate" (Fig A 5-892.431 in the State Aid Manual), which contains similar certification language.

The following are EXCEPTIONS:

Failing Tests Any failure of an acceptance test, meaning a field test, quality control test, or verification test. Corrections or deducts 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.

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:

- 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 observer's quality assurance or verification samples and IA samples

Note that when an acceptance test passes and the companion proficiency or Independent Assurance 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 or under-certified testers. This includes contractor quality control 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.

Exception Clarifications Independent Assurance tests fails and is out of tolerance = Exception.

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

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

Paving without a Mixture Design Report/Recommendation = Exception.

The following are not Exceptions:

Low concrete cylinder strength. Not an exception unless cylinder strength is

specified on that project.

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

Independent Assurance 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 Independent Assurance (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.

NOTE: A summary type report has been developed in CARRS for change orders, supplemental agreements and backsheets items.

**All exceptions not covered by change orders, supplemental agreements or backsheets summary reports need to be listed on the Exception Summary Form. A copy of the change order, supplemental agreement, and Backsheet summary reports must be attached to the Exception Summary Form TP-02171-04.**

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. Examples of actions taken as resolutions may include "standard deduct applied," or "\$ per unit deduct applied," or "mix change made and testing rate increased," or "testing equipment recalibrated, 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 "in close conformity" will be used as 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 or referenced.

#### Certificate of Final Contract Acceptance:

Materials Certification applies to the Acceptance Program activities only. The certification instrument will be the Certificate of Final Contract Acceptance contained on the Final Voucher or the Request for Final Payment. It is the responsibility of the project engineer to verify that all aspects of the Acceptance Program were complied with and those exceptions are appropriately resolved and duly documented in the project file.

By signing the Certificate of Final Acceptance or Request for Final Payment, the Project Engineer is certifying that all aspects of the project have been properly completed. This Technical Memorandum describes the materials aspects of that certification. The certification for materials consists of the following.

1. All materials incorporated into the project were in conformance with the approved plans, special provisions, and specifications (including approved changes).
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 the minimum testing rates listed in the *Schedule of Materials Control* and project special provisions.
3. All county, city 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 independent assurance sample were within tolerance limits of the independent assurance companion samples.
5. Any exceptions to items 1-4 and resolutions to those exceptions have been duly documented and appropriate corrective measures have been taken. Form TP-02171-04 has been completed, placed in the file, and copies sent.

#### Project Compliance Reviews:

Project Compliance Reviews may be conducted by SALT and by other specialty offices. The Federal Single Audit is a separate process conducted independently by the Mn/DOT Auditor's office.

SALT will annually select projects from within various categories to review for compliance with the requirements of the Materials Certification process. Reviewing will also be done to determine compliance with SALT requirements.

SALT will determine review rates and project categories. The rate may vary from category to category of project, and complex project categories may be reviewed at a higher rate. SALT may adjust the rates as deemed necessary to provide reasonable assurance that the Materials Certification process is in compliance.



Both irregularities and areas of outstanding performance found during reviews will be reported back to the City/County Engineer and District/Metro State Aid Engineer. The City/County Engineer, with the cooperation of the District/Metro State Aid Engineer, will address, and if possible correct, all irregularities. The District State Aid Engineer and Construction Practices Specialist will receive a copy of the City/County Engineer ' s explanations.

Independent Assurance:

Independent Assurance is not an integral part of the Materials Certification Process. However boxes are provided on the Materials Certification Exceptions Summary Form to assist the tracking of Independent Assurance activities. The District Materials Engineer is responsible for annually reporting the Independent Assurance activities to the Mn/DOT Pavement Engineer independently of the Materials Certification process.

**QUESTIONS:**

For information on the contents of this technical memorandum, contact Ron Bumann, State Aid Construction Practices Specialist at (651) 779-5399.