



Quality Assurance Program (QAP)

County of Del Norte

The Engineering and Surveying Division of the Community Development Department administers all projects within the Local Assistance Program. The County Engineer is a California-registered civil engineer and is the ultimate responsible person for all quality assurance. The County Engineer may assign a Resident Engineer for each project and will oversee all personnel involved in the testing on the project, to ensure that the materials and workmanship incorporated into each highway construction project are in conformance with the contract specifications. National Highway System roads located within the County of Del Norte's boundaries include US Highway 101 and US Highway 199.

The California Department of Transportation (Caltrans) "Quality Assurance Program for Use by Local Agencies" (Caltrans QAP) shall be used in conjunction with this QAP. Reference is made to various appendices in the Caltrans QAP throughout this QAP.

The purpose of this program is to ensure that the materials incorporated into construction projects located within the County right-of-way are in conformance with the contract specifications. This program, or portions of this program, may be used for projects that are outside the County right-of-way, but fall under the review of the County Engineer. This program should be updated every five years or more frequently if there are changes of the testing frequencies or to the tests themselves.

Definition of Terms

- **Acceptance Testing (AT):** Sometimes called quality control (QC); sampling and testing, or inspection, to determine the degree of compliance with contract requirements
- **Independent Assurance Program (IAP):** Sometimes called quality assurance (QA); verification that AT is being performed correctly by qualified testers and laboratories
 - o Verification that the equipment used for AT is properly calibrated and in good working condition
 - o Witnessing sampling and testing by the AT
 - o Splitting material samples and comparing the test results between the AT and the IAP sampler and tester
- **Quality Assurance Program (QAP):** A sampling and testing program that will ensure that the materials and workmanship incorporated into the construction project are in conformance with the contract specifications; the main elements of a QAP are the AT and IAP
- **Source Inspection:** AT of manufactured and prefabricated materials at locations other than the job site, generally at the manufactured location

- **County:** County of Del Norte
- **Caltrans:** California Department of Transportation

Acceptance Testing (AT)

The County shall use its own materials laboratory or a private consultant materials laboratory to perform AT on Federal-aid and other designated projects. The materials laboratory shall be under the responsible management of a California-registered civil engineer with experience in sampling, inspection, and testing of construction materials. The Engineer shall certify the results of all tests performed by laboratory personnel under the Engineer's supervision. The materials laboratory shall contain certified test equipment capable of performing the tests conforming to the provisions of this QAP.

The consultant materials laboratory, at the County's option, can contract directly with the County, be a subcontractor to a prime contractor, or be a subconsultant to construction management firm working for the County.

Testing methods will be in accordance with the Caltrans methods or a nationally recognized standard (i.e., American Association of State Highway and Transportation Officials [AASHTO], ASTM-International [ASTM], etc.) as specified in the contract specifications and this QAP.

The AT materials laboratory used shall provide documentation that the laboratory complies with the following procedures:

1. **Correlation Testing Program**—The materials laboratory shall be a participant in one or more of the following testing programs:
 - AASHTO Materials Reference Laboratory (AMRL)
 - Cement and Concrete Reference Laboratory (CCRL)
 - Caltrans Reference Sample Program (RSP)

The materials laboratory shall be required to provide evidence of the appropriate certification prior to commencing with AT. A copy of the materials laboratory certification shall be placed in the construction files.

2. **Certification of Personnel**—The materials laboratory shall use personnel who are certified by one or more of the following:
 - Caltrans District Materials Engineer
 - Nationally recognized non-Caltrans organizations (such as, the American Concrete Institute, Asphalt Institute, National Institute of Certification of Engineering Technologies, etc.)
 - Other recognized organizations approved by the State of California and/or recognized by local governments or private associations

The materials laboratory shall be required to provide evidence of the appropriate certifications of its personnel prior to commencing with AT. Copies of the certifications of personnel shall be placed in the construction files.

3. **Laboratory and Testing Equipment**–The AT materials laboratory shall only use laboratory and testing equipment that is in good working order. All such equipment shall be calibrated at least once each year.

All testing equipment must be calibrated by impartial means using devices of accuracy traceable to the National Institute of Standards and Technology. A decal shall be firmly affixed to each piece of equipment showing the date of the last calibration.

Current AASHTO or Caltrans certification of the materials laboratory will be considered evidence that the testing equipment is in good working order and is properly calibrated.

Acceptance Testing (AT) Frequency

The locations and frequencies for AT shall be identified in the contract specifications and shall be as approved by the County Engineer.

The “Sampling and Testing Frequencies” shown in Attachment 1 shall be used as a guide for the frequency of sampling under normal conditions. Material well within specifications and uniform in character may result in less frequent AT to ensure specification compliance, as approved by the County Engineer. Materials supplied from reliable sources and proven by frequent testing to be of uniform high quality, may subsequently receive less AT than indicated in the frequency tables; however, deviations from the frequency tables shall be noted and explained in the construction files. When materials are being furnished intermittently, the frequency of AT may need to be increased to ensure that specification materials are being incorporated into the work.

When tests fail, additional AT may be necessary to isolate the affected work. Documentation of the results of such additional tests shall be included in the construction files, including a description of the corrective measures taken.

As mentioned previously, Attachment 1 of the County’s QAP shall be used as a guide for all projects on County maintained roadways/rights-of-way. The County Engineer may choose to supplement the County’s QAP standards with some or all of Appendix D of the Caltrans QAP. As required by the Federal Highway Administration (FHWA), Appendix D of the Caltrans QAP shall be used for all projects on the National Highway System (NHS).

Relatively minor quantities of construction materials may be accepted without AT provided acceptance conforms to the conditions stated in below:

1. The construction inspector, on the basis of a visual examination, may accept minor quantities of materials without testing, provided the source of the supplies is known to furnish similar materials for the project or other projects that have been found to be satisfactory using normal sampling and testing requirements.
2. Acceptance of a product may be based on a certificate of compliance.

Generally, this provides for accepting minor quantities of materials from a commercial source that is known to be a supplier of the specification material.

Documentation for acceptance of material as describe in above-paragraphs 1 and 2 shall be provided in the construction files. Documentation should include statements in the inspector’s reports that indicate conditions under which the material was accepted (e.g., description, quantity, location, where placed, certification numbers, and/or other accompanying data).

As a guideline, the following list provides approximate maximum quantities of materials that may be accepted under the conditions described in above-paragraphs 1 and 2. (This list is not intended to be inclusive of all materials that may be accepted in this manner):

- Aggregates other than for use in Portland cement concrete (PCC)–not to exceed 100 tons per day may be sampled at Engineer’s discretion if project total is less than 500 tons.
- Bituminous mixtures (e.g., hot mix asphalt [HMA])–not to exceed 50 tons per day may be sampled at Engineer’s discretion if project total is less than 500 tons.
- Bituminous material (e.g., asphaltic emulsion)–not to exceed 100 gallons per project may be sampled at Engineer’s discretion.
- Masonry items–at the Engineer’s discretion, check dimensions of products for specification compliance and uniformity of manufacture.
- Materials used for improvement projects with a total length not to exceed the distance of the frontage of one property

Independent Assurance (IA) Testing

IA testing may be used to verify that AT sampling and testing procedures are being performed properly and that all testing equipment is in good condition and properly calibrated. IA testing, when required, shall be provided by personnel from Caltrans, the County’s certified materials laboratory, or a consultant’s certified materials laboratory.

The County shall perform IA testing on Federal-aid and other designated projects. The materials laboratory performing the IA testing shall be under the responsible management of a California-registered civil engineer with experience in sampling, inspection, and testing of construction materials. The Engineer shall certify the results of all tests performed by laboratory personnel under the Engineer’s supervision. The materials laboratory shall contain certified test equipment capable of performing the tests conforming to the provisions of this QAP.

IA testing materials laboratory and personnel shall be certified in required testing procedures, as part of IA testing, and shall not be involved in any aspect of AT. Copies of the materials laboratory and personnel certifications shall be placed in the construction files.

IA testing shall be performed on every type of materials test required for the project. At the discretion of the County, proficiency tests may be performed on sieve analysis, sand equivalent, and cleanness value tests.

IA test results are reported on a “Corroboration Report” (Caltrans Form MR-0104, as an example). Test results are also recorded on an “Independent Assurance Sampling and Testing Log Summary” (Caltrans Form MR-0110, as an example).

Poor correlation between acceptance tester’s results and other test results may indicate probable deficiencies with the acceptance sampling and testing procedures. In cases of unresolved discrepancies, a complete review of AT shall be performed by IA personnel, or an independent materials laboratory chosen by the County. IA tests are not to be used for determining compliance with contract requirements. Compliance with contract requirements is determined only by AT.

Testing of Manufactured Materials

Acceptance of manufactured and prefabricated structural materials shall be based on either source inspection or a certificate of compliance.

Source Inspection

If source inspection is determined to be appropriate, the inspection will normally be performed by a qualified consultant working for the County.

If a qualified consultant is not available, and prior to submitting a request for authorization for the construction phase of a project, the County may submit a "Source Inspection Request" (see Exhibit 16-V of the *Local Assistance Procedures Manual* [LAPM]) to Caltrans. Caltrans source inspection services are performed on a reimbursable basis. The Caltrans source inspection shall be indicated on the request for authorization checklist and finance letter. If Caltrans accepts the request to conduct source inspection, all sampling, testing, and acceptance of manufactured and prefabricated materials will be performed by Caltrans' Office of Materials Engineering and Testing Services (METS). The Resident Engineer requests the Caltrans source inspection by completing and submitted a "Notice of Materials to be Used" from CEM-3101.

Certificates of Compliance

Certificates of compliance are appropriate for products, materials, or assemblies that are non-custom structural items with a history of having met specifications based upon previous sampling and testing. A list of materials that can be accepted by a certificate of compliance is included in Attachment 2.

Manufactured products, materials, or assemblies used on the basis of certificates may be sampled again at the job site and tested at any time during the life of the contract. Items found later not in conformance with contract requirements shall be subject to rejection whether in place or not.

Certificates of compliance for each item shall be placed in the construction project files.

Acceptance of additional materials approved by means of certificates of compliance shall be as approved by the County Engineer. All certificates of compliance shall conform to the requirements of the contract specifications and state that the included materials and workmanship conform in all respects to the project specifications for the material. The certified material lot number and project name shall be clearly identified on the certificate and on lot tags affixed or stenciled to the released materials. Project inspectors shall reference certificates, materials incorporated into work, and lot numbers in daily inspection reports. An example certificate of compliance is included in Attachment 2.

Reporting Test Results

Generally, test results should be reported to the Resident Engineer within 24 hours after sampling. Test results for materials with wait-times (e.g., concrete cylinders) should be reported to the Resident Engineer within 24 hours after testing. Test results that indicate non-compliant work shall be reported to the Resident Engineer immediately after the testing is completed.

The reporting of AT and IA results shall be done on an expedited basis, such as, by fax or email.

Project Certification

Upon completion of a Federal-aid project, a "Materials Certificate" (Exhibit 17-G of the LAPM) shall be completed and signed by the Resident Engineer. The County shall include the "Materials Certificate" in the report of expenditures submitted the Caltrans upon project completion. A copy of the "Materials Certificate" shall also be included in the construction project files. All materials incorporated into the work, but that did not conform to specifications, must be explained and justified on the "Materials Certificate," including changes by virtue of contract change orders.

Records

All material records of samples and tests, material releases, and certificates of compliance for the construction project shall be incorporated into the construction project files. If a Federal-aid project:

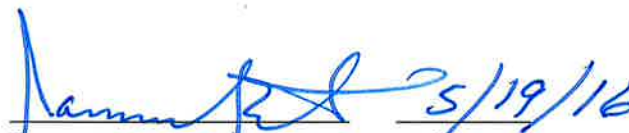
- In general, the files shall be organized as described in Chapter 16 "Administer Construction Contracts" of the LAPM or the Caltrans Construction Manual.
- Complete project files should be available at a single location for inspection by Caltrans and FHWA personnel.
- The project files shall be available for at least three years following the date of final project voucher.
- The use of a summary log is required. The summary log shall include appropriate data, such as, station, location, depth of sample, approximately quantity of material represented by the test sample, test result, and tester. Failing test results shall be addressed by the Resident Engineer. Generally, failed tests require retesting of the material with cross-references of the retest to the initial failing test result previously entered in the summary log. There will be times, where it is appropriate for inspection staff to use professional judgment to accept a material with a failed test result (e.g., a failed subgrade compaction test that gets re-compacted by the Contractor but the AT personnel are not immediately available to perform a re-test).

When two or more projects are being furnished identical materials simultaneously from the same plant, it is not necessary to take separate samples or perform separate tests for each project; however, copies of the test reports are to be provided for each of the projects to complete the records.

Attachments:

- A. Acceptance Sampling and Testing Frequencies
- B. Sample Certificate of Compliance and List of Materials Typically Accepted by a Certificate of Compliance

Approved by:


James Barnts, PE
County Engineer
County of Del Norte

5/19/16
Date

Attachment 1

Acceptance Sampling and Testing Frequencies

1. Roadway Excavation and Embankment:

Test Method	Description	Minimum AT Frequency
CT 231	Relative Compaction by the Area Concept Using Nuclear Gages	As specified in the Caltrans procedure but not less than: • 1 test for each 2 feet of embankment measured vertically and a minimum of 3 tests for areas less than 1,000 sq-yds • 1 test for every 300 feet of trench length and for every 3 feet of trench depth
CT 301	Resistance (R) Value	• 1 test on material below the grading plane for every 1,000 feet of roadway length at the discretion of the Engineer

2. Imported Borrow:

Test Method	Description	Minimum AT Frequency
CT 301	Resistance (R) Value	• 1 test for each supplier and product^{1,2}
1. If required by County Engineer 2. Contractor must provide current test results of proposed material(s) prior to use.		

3. Structure Backfill

Test Method	Description	Minimum AT Frequency
Various	Certificates of Compliance for imported backfill materials	• 1 for each supplier and product
CT 202	Sieve Analysis.	• 1 test for each supplier and product^{1,2}
CT 231	Relative Compaction by the Area Concept Using Nuclear Gages	As specified in the Caltrans procedure but not less than: • 1 test for each 2 feet of embankment measured vertically and a minimum of 3 tests for areas less than 1,000 sq-yds • 1 test for every 300 feet of trench length and for every 3 feet of trench depth
1. If required by County Engineer 2. Contractor must provide current test results of proposed material(s) prior to use.		

4. Rock Slope Protection:

Test Method	Description	Minimum AT Frequency
Various	Certificates of Compliance for imported materials	1 for each supplier and product.
CT 206	Specific Gravity and Absorption of Coarse Aggregate	1 test for each supplier and product for significant projects in the County right-of-way^{1,2}
CT 229	Durability Index	
1. If required by County Engineer 2. Contractor must provide current test results of proposed material(s) prior to use.		

5. Concrete Backfill and Slurry Backfill:

Test Method	Description	Minimum AT Frequency
Various	Mix Design Submittal	Minimum 1 design mix submittal for each material type¹
	Weighmaster Certificates	1 for each material delivery
1. Contractor must provide current test results of proposed material(s) prior to use.		

6. Aggregate Base and Subbase:

Test Method	Description	Minimum AT Frequency
Various	Certificates of Compliance	1 for each supplier and product.
CT 202	Sieve Analysis of Fine and Coarse Aggregates	1 test for each supplier and product for significant projects in the County right-of-way 1 test for each 1,000 cy placed.^{1,2}
CT 217	Sand Equivalent	
CT 229	Durability Index	
CT 231	Relative Compaction of Aggregates by the Area Concept Utilizing Nuclear Gages	1 test for every 300 feet of street length and 1 for each localized area for significant projects in the County right-of-way
CT 301	Resistance (R) Value	1 test for each supplier and product for significant projects in the County right-of-way^{1,2}
1. If required by County Engineer 2. Contractor must provide current test results of proposed material(s) prior to use.		

7. Hot Mix Asphalt:

Test Method	Description	Minimum AT Frequency
Various	Various	In accordance with Caltrans Section 39, Standard Process

8. Structural Concrete:

Test Method	Description	Minimum AT Frequency
Various	Mix Design Submittal	Minimum 1 design mix submittal for each material type¹
CT 202	Sieve Analysis of Fine and Coarse Aggregates	1 test on material in mix design for significant projects in the County right-of-way must be submitted, not more than 60 days before notice to proceed.
CT 206	Specific Gravity and Absorption of Coarse Aggregate	
CT 211	Abrasion of Coarse Aggregate By Use of The Los Angeles Rattler Machine	
ASTM C595, ASTM C 150-02a	Certificate of Compliance for Cement	1 certificate for each supplier and product for significant projects in the County right-of-way¹
ASTM C260	Certificate of Compliance for Air Entrainment Admixture	
ASTM C494	Certificate of Compliance for Water Reducers or Set Retarder Admixtures	
ASTM C309	Certificate of Compliance for Curing Compound	
CT 521	Concrete Compressive Strength	1 set for each 150 cubic yards placed but not less than one set for day during structural concrete placement.
CT 543	Air Content of Freshly Mixed Concrete By the Volumetric Method	
CT 556	Slump of Fresh Portland Cement Concrete	
CT 557	Temperature of Portland Cement Concrete at Time of Placement	
1. Contractor must provide current test results of proposed material(s) prior to use.		

9. Slurry Seals

Test Method	Description	Minimum AT Frequency
CT 217	Sand Equivalent for Aggregate	1 test for each supplier and product for significant projects in the County right-of-way ^{1,2}
CT 202	Sieve Analysis for Aggregate	
CT 229	Durability Index	
1. If required by County Engineer. 2. Contractor must provide current test results of proposed material(s) prior to use.		

10. Chip Seals

Test Method	Description	Minimum AT Frequency
CT 217	Sand Equivalent for Aggregate	1 test for each supplier and product for significant projects in the County right-of-way ^{1,2}
CT 202	Sieve Analysis for Aggregate	
CT 229	Durability Index	
1. If required by County Engineer. 2. Contractor must provide current test results of proposed material(s) prior to use.		

11. Emulsions

Test Method	Description	Minimum AT Frequency
Various	Certificates of Compliance	• 1 for each supplier and product • 1 test for each supplier and product for significant projects in the County right-of-way^{1,2}
AASHTO T59	Residue	
AASHTO T49	Penetration	
1. If required by County Engineer 2. Contractor must provide current test results of proposed material(s) prior to use.		

Sample Certificate of Compliance

COMPANY LETTERHEAD

CERTIFICATE OF COMPLIANCE

For Contract _____

I certify that the material listed below complies with the material and workmanship requirements of the Caltrans Contract Plans, Special Provisions, Standard Specifications and Standard Plans for the contract listed above.

I also certify that I am an official representative for _____, the manufacturer of the material listed below. Furthermore, I certify that where California Test methods, physical, or chemical test requirements are part of the specifications, that the manufacturer has performed the necessary quality control to substantiate this certification.

Material Description:

Manufacturer: _____

Model: _____

Serial Number (if applicable): _____

Quantity to be supplied: _____

Remarks: _____

Signed by: _____

Printed Name: _____

Title: _____

Company: _____

Date: _____

Construction Materials Typically Accepted by a Certificate of Compliance

- Soil Amendment
- Fiber Mulch, Seeds and Straw
- Cobbles
- Stabilizing Emulsion
- Plastic Pipe Supply, Irrigation Lines and Related Hardware
- Irrigation Controllers
- Lime
- Preformed Elastomeric Joint Seal
- Plan and Fabric Reinforced Elastomeric Bearing Pads
- Steel Reinforced Elastomeric Bearing Pads
- Waterstops
- Geotextiles
- Reinforcing Steel (Including Epoxy Coated)
- Structural Timber and Lumber
- Treated Timber and Lumber
- Timber and Lumber
- Manholes, Catch Basins and Drainage Inlets (Including Misc. Iron and Steel)
- Culvert and Drainage Pipe Joints
- Reinforced Concrete Pipe
- Corrugated Steel Pipe and Corrugated Steel Pipe Arches
- Structural Metal Plate Pipe Arches and Pipe Arches
- Perforated Steel Pipe
- Plastic Pipe
- Steel Entrance Tapers, Pipe Down drains, Reducers, Coupling Bands and Slip Joints
- Aluminum Pipe (Entrance Tapers, Arches, Pipe Down drains, Reducers, Coupling Bands and Slip Joints)
- Fencing and Related Hardware
- Metal Railings, Barriers and Related Hardware
- Metal Target Plates
- Sign Posts, Panels and Related Hardware
- Delineators and Markers
- Electrical Conductors and Related Hardware
- Signal and Street Lighting Foundation Bolts, Standards, Mast Arms, Fixtures and Related Hardware
- Portland Cement
- Concrete Coarse Aggregate (Minor Projects)
- Concrete Fine Aggregate (Minor Projects)
- PCC Admixtures
- Minor Concrete
- Asphalt (Oil), Liquid Asphalt and Asphaltic Emulsion
- Epoxy
- Truncated Domes
- Paint and Thermoplastic

**SAMPLE COVER MEMO SOURCE
INSPECTION REQUEST FROM
LOCAL AGENCY TO
CALTRANS' DISTRICT LOCAL ASSISTANCE ENGINEER**
(Prepared By Applicant On Applicant Letterhead)

To: (DLAE name)
Caltrans' District Local Assistance Engineer
Caltrans' Local Assistance Office
(District office Address)

Date: _____

Federal-aid Project Number: _____ (if one has been assigned)

Project Description _____

Project Location: _____

Subject: (Source Inspection for Project Name, County) _____

We are requesting that Caltrans provide Source Inspection (reimbursed) services for the above mentioned project. We understand we are responsible for paying for this service provided for by the State. Listed below are the materials for which we are requesting Caltrans' Source Inspection (reimbursed) services.

Materials that will require source inspection:

Justification for request: (Based on the requirements in Section 16.14 under "Source Inspection") _____

Any question you might have about the above materials should be directed
to: _____, at (phone #) _____.

Approved:

(Applicant Representative Name)

(DLAE name)
District Local Assistance Engineer

(Title)

(Date)

(Local agency, name & address)



Appendix K - Examples of Materials Certificates/Exceptions (Signed by the Resident Engineer at the Completion of the Project)

Federal-aid Project No.: Project HP21L – 5055 – 111

Subject: Materials Certification

This is to certify that the results of the tests on acceptance samples indicate that the materials incorporated in the construction work and the construction operations controlled by sampling



and testing were in conformity with the approved plans and specifications.



All materials exceptions to the plans and specifications on this project are noted below.

No exceptions were found to the plans and specifications on this project.

Bill Sanders
Resident Engineer (Print Name)

Bill Sanders
Resident Engineer (Signature)

7/7/07
(Date)

Note: The signed original of this certificate is placed in the Resident Engineer's project files and one copy is mailed to the DLAE and filed under "Report of Expenditures."

See the attachment (next page)



Appendix K (continued)

Attachments: Materials Exceptions (Acceptance Testing)

Type of Test	Description of Work	Total Tests Performed On the Project	Number of Failed Tests	Action Taken
Slump Test	Concrete Sidewalk	8	1	When the measured slump exceeded the maximum limit, the entire concrete load was rejected.
Sand Equivalent	Aggregate for Structural Concrete	10	1	The tested S.E. was 70 and the contract compliance specification was 71 minimum. However, the concrete 28-day compressive strength was 4800 psi. The concrete was considered adequate and no materials deductions were taken.
Compaction	Sub grade Material	12	1	One failed test was noted. The failed area was watered and reworked. When this was completed, a retest was performed. The retest was acceptable.
Compaction	Hot Mix Asphalt	12	1	One failed area was noted. It was reworked and retested. The second test met specifications.

Bill Sanders

Resident Engineer (Print Name)

Bill Sanders

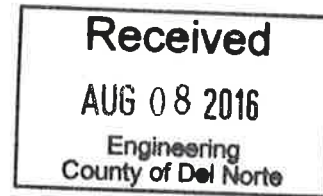
Resident Engineer (Signature)

July 4, 2007

Date

DEPARTMENT OF TRANSPORTATION

DISTRICT 1, P. O. BOX 3700
EUREKA, CA 95502-3700
PHONE (707) 445-6397
FAX (707) 441-2048
TTY 711



*Serious drought.
Serious drought.
Help save water!*

August 5, 2016

Rosanna Bower
County of Del Norte
981 "H" Street Suite 110
Crescent City, CA. 95531

Dear Ms. Bower:

The District 1 Office of Local Assistance has received and reviewed the "Quality Assurance Plan" (QAP) submitted by your agency on July 26, 2016. Our review verifies that the contents of your QAP conform to the guidelines stipulated in the current Local Assistance Procedures Manual and the Quality Assurance Program (QAP) Manual for use by Local Agencies.

If you have any questions or need additional information, please call me at the above number.

Sincerely,

A handwritten signature in blue ink, appearing to read "Brett Gronemeyer".

Brett Gronemeyer
Local Assistance Engineer