

**SECTION V**

**QUALITY ASSURANCE PROGRAM**

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# QUALITY ASSURANCE PROGRAM (QAP)

## AGENCY: County of Mono

The County of Mono has established the following Quality Assurance Program (QAP) to provide assurance that the quality of materials incorporated into County construction projects are in conformance with the requirements of the approved plans and contract specifications, including approved changes. The terms of the QAP will be every five years starting from the date of the original activation of this QAP, or upon changes of testing frequencies or to the tests themselves. Testing Standards are found as Appendix A to this document.

### DEFINITION OF TERMS

- Acceptance Testing (AT) – Sampling and testing, or inspection, to determine the degree of compliance with contract requirements.
- Independent Assurance Program (IAP) – Verification that AT is being performed correctly by qualified testers and laboratories.
- Quality Assurance Program (QAP) – A sampling and testing program that will provide assurance 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.

### MATERIALS LABORATORY

The County will use their own materials laboratory or a private consultant materials laboratory to perform Acceptance Testing (AT) on Federal-aid and other designated projects. The materials laboratory shall be under the responsible management of a California registered 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 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:
  - a. AASHTO Materials Reference Laboratory (AMRL)
  - b. Cement and Concrete Reference Laboratory (CCRL)
  - c. Caltrans' Reference Samples Program (RSP)
2. Certification of Personnel – The materials laboratory shall employ personnel who are certified by one or more of the following:
  - a. Caltrans District Materials Engineer
  - b. Nationally recognized non-Caltrans organizations such as the American Concrete Institute, Asphalt Institute, National Institute of Certification of Engineering Technologies, etc.
  - c. Other recognized organizations approved by the State of California and/or recognized by local governments or private associations.
3. Laboratory and Testing Equipment – The 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. All testing equipment calibration decals shall be checked as part of the IAP.

### **ACCEPTANCE TESTING (AT)**

AT will be performed by a materials laboratory certified to perform the required tests. The tests results will be used to ensure that all materials incorporated into the project are in compliance with the contract specifications. Testing methods will be in accordance with the CT Methods or a national recognized standard (i.e., AASHTO, ASTM, etc.) as specified in the contract specifications.

Sample locations and frequencies may be in accordance with the contract specifications. If not so specified in the contract specifications, samples shall be taken at the locations and frequencies as shown in Appendix A. Materials not included in Appendix A shall be tested in accordance with the Quality Assurance Program Manual for Use by Local Agencies (Manual) as produced by the California Department of Transportation.

### **INDEPENDENT ASSURANCE PROGRAM (IAP)**

IAP shall be provided by personnel from Caltrans, the Agency's certified materials laboratory, or consultant's certified materials laboratory. IAP will be used to verify that sampling and testing procedures are being performed properly and that all testing equipment is in good condition and properly calibrated.

IAP personnel shall be certified in all required testing procedures, as part of IAP, and shall not be involved in any aspect of AT. IAP shall be performed on every type of materials test required for the project. Proficiency tests shall be performed on Sieve Analysis, Sand Equivalent, and Cleanness Value tests. All other types of IAP shall be witness tests.

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 IAP personnel or an independent materials laboratory chosen by the Agency. IAP samples and tests are not to be used for determining compliance with contract requirements. Compliance with contract requirements is determined only by AT.

### **REPORTING ACCEPTANCE TESTING RESULTS**

The following are time periods for reporting material test results to the Resident Engineer:

- When the aggregate is sampled at material plants, test results for Sieve Analysis, Sand Equivalent and Cleanness Value should be submitted to the Resident Engineer within two working days after sampling.
- When materials are sampled at the job site, test results for compaction and maximum density should be submitted to the Resident Engineer within two working days after sampling.
- When soils and aggregates are sampled at the job site:
  - (1) Test results for Sieve Analysis, Sand Equivalent and Cleanness Value should be submitted to the Resident Engineer within three working days after sampling.
  - (2) Test results for "R" Value and asphalt concrete extraction should be submitted to the Resident Engineer within four working days after sampling.

When sampling products such as Portland Cement Concrete (PCC), cement-treated base (CTB), hot mix asphalt (HMA), and other such materials; the time of such sampling shall be varied with respect to the time of the day insofar as possible, in order to avoid a predictable sampling routine. The reporting of AT results, if not performed by the Resident Engineer's staff, shall be done on an expedited basis such as by fax, e-mail or telephone.

### **TESTING OF MANUFACTURED MATERIALS**

A list of materials that can be typically accepted on the basis of certificates of compliance during construction is found in Appendix A. All certificates of compliance shall conform to the requirements of the contract specifications, for examples see Appendix J of the Manual.



Mono County Department of Public Works  
 Quality Assurance Program  
 Appendix A - Acceptance Sampling and Testing Frequencies

Construction Materials Accepted by a Certificate of Compliance<sup>1,2,3</sup>

- Soil Amendment
- Fiber
- Fly Ash
- Geotextile Fabric
- Mulch
- Stabilizing Emulsion
- Plastic Pipe
- Lime
- Reinforcing Steel
- Structural Timber and Lumber
- Treated Timber and Lumber
- Timber and Lumber
- 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
- Polyvinyl Chloride Pipe and Polyethylene Tubing
- Steel Entrance Tapers, Pipe Down Drains, Reduces, Coupling Bands and Slip Joints
- Aluminum Pipe (Entrance Tapers, Arches, Pipe Down Drains, Reduces, Coupling Bands, and Slip Joints)
- Metal Target Plates
- Electrical Conductors
- Portland Cement
- Minor Concrete
- Air Entrainment Mixture
- Water Reducers and Set Retarders
- Waterstop

<sup>1</sup>If Caltrans Standard Specifications May 2006 is part of contract specifications.

<sup>2</sup>Usually these items are inspected at the site of manufacture or fabrication and reinspected after delivery to the job site.

<sup>3</sup>Mono County reserves the right to test any material supplied for County projects. The conditions of this QAP can be overridden by the conditions of the Standard Specifications.

**Testing and Sampling Requirements**

**Portland Cement (Hydraulic Cement)**

Materials to be Samples or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description or Comments
Cement (Testing Only)	8-lb. sample	If the product is accepted based on a Certificate of Compliance, testing is not required. If the product is not accepted using a Certificate of Compliance, test at least once per job.	ASTM C109, CT 515, AASHTO T106	If testing appears warranted, fabricate six 2-in. mortar cubes using the Portland (or hydraulic) cement. Test for compressive strength.

**Portland Cement Concrete (Hydraulic Cement Concrete)**

Materials to be Samples or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description or Comments
Aggregate for Hydraulic Cement Concrete (Sampling & Testing)	50-lb. sample	Take one aggregate sample for 1,000 CY of PCC/HCC concrete. Test at least one sample per job.	ASTM D75, CT 125, AASHTO M6, T2, M80	Sample aggregate from belt or hooper (random basis).
Water (Sampling & Testing)	Take a two-quart sample using a clean plastic jug (with lining) and sealed lid. Sample at the point of use.	If the water is clean with no record of chlorides or sulfates greater than 1%, no testing is required. If the water is dirty, do not use it. Test only when the chloride or sulfates are suspected to be greater than 1%.	CT 405, CT 422, CT 417, AASHTO R23	If testing appears warranted, test for chlorides and sulfates.

**Portland Cement Concrete (Hydraulic Cement Concrete)**

Materials to be Samples or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description or Comments
Air Entraining Admixtures (Sampling & Testing)	Take a one-quart sample using a clean, lined can or plastic bottle, if liquid. If powder, take a 2.5-lb. sample.	if the product is accepted based on a Certificate of Compliance, testing is not required. If not, take one sample per job. Prior to sampling, check with Caltrans (METS) for acceptable brands and dosage rates.	ASTM C233, AASHTO M154, T157, C260	If testing appears warranted, test for chlorides and sulfates. Admixtures with sulfates and chlorides greater than 1% should not be used.
Water Reducers or Set Retarders (Sampling & Testing)	if liquid, take a 1-qt. sample using a clean plastic can. If powder, take a 2.5-lb. sample.	if the product is accepted based on a Certificate of Compliance, testing is not required. If not, test once per job. Prior to using this product, please check with Caltrans (METS) for acceptable brands and dosage rates.	ASTM C494, AASHTO M194	If testing appears warranted, test for chlorides and sulfates. Admixtures with sulfates and chlorides greater than 1% should not be used.
Freshly-Mixed Concrete (Sampling)	Approx. 150 lb. (or 1 CF) near mixer discharge.	When tests are required, take at least one sample for each 500 to 1,000 CY of PCC/HCC.	ASTM C172, C685, CT 539, AASHTO T141, M157	This describes a method to sample freshly-mixed concrete.
Freshly-Mixed Concrete (Testing)	Approx. 150 lb. (or 1 CF) near mixer discharge.	On projects with 500 CY or more, test at least one sample per job.	ASTM C143, AASHTO T119	This test determines the slump of the freshly-mixed concrete.
Freshly-Mixed Concrete (Testing)	Approx. 150 lb. (or 1 CF) near mixer discharge.	On projects with 500 CY or more, test at least one sample per job.	ASTM C360, CT 533	This test determines the ball penetration of the freshly-mixed concrete.
Freshly-Mixed Concrete (Testing)	Approx. 150 lb. (or 1 CF) near mixer discharge.	On projects with 500 CY or more and concrete exposed to freeze-thaw cycles, test at least one sample per job.	ASTM C231, CT 504, AASHTO T152	This test determines the air content of freshly-mixed concrete (pressure method).
Freshly-Mixed Concrete (Testing)	Approx. 150 lb. (or 1 CF) near mixer discharge.	On projects with 500 CY or more, test at least one sample per job.	ASTM C138, CT 518, AASHTO T121	This test determines the unit weight of freshly-mixed concrete.
Freshly-Mixed Concrete (Testing)	Approx. 150 lb. (or 1 CF) near mixer discharge.	Fabricate at least two concrete cylinders per project. Test for compressive strength at least once for each 500 to 1,000 CY of concrete.	ASTM C39, CT 521, AASHTO T22	This test is used to fabricate 6" x 12" concrete cylinders. Compressive strengths are determined, when needed.
Freshly-Mixed Concrete (Testing)	Approx. 210 lb. of concrete are needed to fabricate three concrete beams.	On sample set for each 500 to 1,000 CY of concrete.	ASTM C78, CT 31, AASHTO T97, T23	This test is used to determine the flexural strength of simple concrete beams in third-point loading.

**Soils and Aggregates**

Materials to be Samples or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description or Comments
Aggregate (Sampling)	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project.	ASTM D75, CT 125, AASHTO T2	This test describes the procedures to sample aggregate from the belt or hopper (random basis).
Fine Aggregates (Testing)	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project.	ASTM C128, CT 208, AASHTO T84	This test determines the apparent specific gravity of fine aggregates for bituminous mixes, cement treated bases, and aggregate bases.
Fine Aggregates (Testing)	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project.	ASTM C128, CT 207, AASHTO T84	This test determines the bulk specific gravity (SSD) and the absorption of material passing the No. 4 sieve.
Course Aggregates (Testing)	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project.	CT 206	This test determines the cleanness of coarse aggregate.
Course Aggregates (Testing)	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project.	ASTM C127, CT 277, AASHTO T85	This test determines the specific gravity and absorption of coarse aggregate (material retained on the No. 4 sieve).
Soils and Aggregates (Testing)	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project.	ASTM C136, CT 202, AASHTO T27	This test determines the gradation of soils and aggregates by sieve analysis.
Soils and Aggregates (Testing)	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project.	ASTM D2419, CT 217, AASHTO T176	This test determines the Sand Equivalent of soils and aggregates.
Soils and Aggregates (Testing)	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project.	ASTM C117, AASHTO T11	This test determines the gradation of materials finer than the No. 200 sieve (by washing method)

**Soils and Aggregates**

Materials to be Samples or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description or Comments
Soils and Aggregates (Testing)	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project.	ASTM D5744, CT 229, AASHTO T210	This test determines the Durability Index of soils and aggregates.
Soils and Aggregates (Testing)	One 50-lb. sample	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project.	ASTM D2844, CT 301, AASHTO T190	This test determines the Resistance Value (R-) and expansion pressure of compacted materials.
Soils and Aggregates (Testing)	One random location for every 2,500 SF.	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project.	ASTM D2922, CT 231, AASHTO T238	This test determines field densities using the nuclear gage.
Soils and Aggregates (Testing)	One random location for every 2,500 SF.	Take one sample for every 500 to 1,000 tons of materials. Test at least one sample per project.	ASTM D3017, CT 231, AASHTO T239	This test determines the water content using the nuclear gage.
Asphalt Binder (Sampling)	One 0.5-gal. sample placed in a clean, sealed can.	Sample once per job at the asphalt concrete plant.	CT 125, ASTM D979, AASHTO T168, T48	This procedure describes the proper method to sample the asphalt binder.
Asphalt Binder (Testing)	One 0.5-gal. sample placed in a clean, sealed can.	Sample once per job at the asphalt concrete plant.	ASTM D92, D117, AASHTO T48	This test determines the flash point of the asphalt binder (by Cleveland open cup).
Asphalt Binder (Testing)	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed.	ASTM D2872, D92, CT 346, AASHTO T240, T48	This test determines the rolling thin-film oven test (RTFO).
Asphalt Binder (Testing)	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed.	ASTM D2042, AASHTO T44	This test determines the solubility of asphalt material in trichloroethylene.
Asphalt Binder (Testing)	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed.	ASTM D2171, AASHTO T202	This test determines the dynamic viscosity, (absolute viscosity of asphalt @ 140 degrees F by the Vacuum Capillary Viscometer Poes).
Asphalt Binder (Testing)	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed.	ASTM D5, AASHTO T49	This test determines the penetration of bituminous material @ 77 degrees F and percentage of original penetration from the residue.
Asphalt Binder (Testing)	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed.	ASTM D113, AASHTO T51	This test determines the ductility of asphalt @ 77 degrees F.
Asphalt Binder (Testing)	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed.	ASTM D2170, AASHTO T201	This test determines the kinematic viscosity of asphalt @ 275 degrees F (Centistoke).
Asphalt Binder (Testing)	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed.	ASTM D2171, AASHTO T202	This test determines the dynamic viscosity (absolute viscosity of asphalt @ 140 degrees F by the Vacuum Capillary Viscometer Poes).
Asphalt Binder (Testing)	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed.	ASTM D36, AASHTO T 53	The test determines the softening point of asphalt.

**Asphalt Emulsified**

Materials to be Samples or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description or Comments
Emulsified Asphalt (Sampling)	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed.	ASTM D140, D979, CT 125, AASHTO T40, T168	This test describes the procedure to sample the emulsified asphalt.
Emulsified Asphalt (Testing)	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed.	ASTM D244, AASHTO T59	This test determines the sieve retention of emulsified asphalt.
Emulsified Asphalt (Testing)	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed.	ASTM D244, AASHTO T59	This test determines the weight per gallon of emulsified asphalt.
Emulsified Asphalt (Testing)	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed.	ASTM D244, AASHTO T59	This test determines the penetration of the emulsified asphalt.
Emulsified Asphalt (Testing)	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed.	ASTM D244, CT 330, AASHTO T59	This test determines the residue @325 degrees F evaporation of emulsified asphalt.
Emulsified Asphalt (Testing)	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed.	ASTM D4402, AASHTO T201	This test determines the Brookfield viscosity.

**Asphalt Emulsified**

Materials to be Samples or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description or Comments
Emulsified Asphalt (Testing)	One 0.5-gal. sample placed in a clean, sealed can.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete placed.	ASTM D88, AASHTO T72	This test determines the Saybolt-Furol viscosity of emulsified asphalt @ 77 degrees F. (seconds).

**Hot Mix Asphalt (Asphalt Concrete) - Concrete**

Materials to be Samples or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description or Comments
Asphalt Concrete (Sampling)	Obtain one 30-lb. sample each day of production.	Obtain one sample at the asphalt concrete plant for each 5,000 tons of asphalt concrete placed.	ASTM D75, D140, D979, CT 125, AASHTO T40, T168	This test describes the procedure to sample the asphalt concrete.
Asphalt Concrete (Testing)	4" x 8" cores	Take one 4" x 8" core for every 500 feet of paved roadway.	ASTM D1188, D1560, D1561, D5361, CT 304, AASHTO T246, T247	This test determines the field density of street samples.
Asphalt Concrete (Testing)	Obtain one 30-lb. sample for each day of production.	Obtain one sample for every five cores taken.	ASTM D1188, D1560, D1561, D5361, CT 304, AASHTO T246, T247	This test determines the laboratory density and relative compaction of asphalt concrete.
Asphalt Concrete (Testing)	4" x 8" cores	Obtain one sample for every five cores taken.	ASTM D2726, D1188, D5361	This test determines the specific gravity of compacted bituminous mixture dense-graded or non-absorptive.
Asphalt Concrete (Testing)	One 30-lb. sample.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete.	ASTM D1559, AASHTO T245	This test determines the resistance to plastic flow of prepared mixes as determined by the Marshall Method.
Asphalt Concrete (Testing)	One 30-lb. sample.	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete.	ASTM C117, D2172 (use Method B), AASHTO T164	This test determines the screen analysis of aggregates recovered from asphalt materials.
Asphalt Concrete (Testing)	Sample any test location (random basis).	Obtain one sample at the asphalt concrete plant for each 1,000 tons of asphalt concrete.	ASTM D2950, CT 375	This test determines the nuclear field density of in-place asphalt concrete.
Asphalt Concrete (Testing)	One 10-lb. sample.	Obtain one sample during every day of production.	ASTM D1560, D1561, CT 366, AASHTO T246, T247	This test determines the stability value of asphalt concrete.
Slurry Seals (Sample)	One 0.5-gal. sample in a clean, dry plastic container.	Obtain one sample per truck.	ASTM D979, CT 125, AASHTO T40, T168	This test describes the procedure for sampling the slurry seal.
Aggregate for Slurry Seals (Testing)	One 30-lb. sample.	Obtain at least one sample per project from the belt of hopper or stockpile and test for Sand Equivalent.	ASTM D2419, CT 217, AASHTO T176	This test determines the Sand Equivalent of aggregates.
Aggregate for Slurry Seals (Testing)	One 30-lb. sample.	Obtain at least one sample per project from the belt of hopper or stockpile and test for sieve analysis of fine sand.	ASTM C117, AASHTO T11	This test determines the sieve analysis of fine sand (gradation of materials finer than No. 220 sieve by wash grading).
Slurry Seals (Testing)	One 0.5-gal. sample in a clean, dry plastic container.	Test one sample per project and test for Abrasion.	ASTM D5910	This test determines the Wet Track Abrasion Test (2) (WTAT).

**Steel**

Materials to be Samples or Tested	Sample Size	Sampling/Testing Frequency	Typical Test Methods	Description or Comments
Steel Strand (Testing)	Sample stand at various sizes.	This item may be accepted using a Certificate of Compliance. Sample and test at least two steel strands per job when a Certificate of Compliance is not used.	ASTM A370, A416, E328, AASHTO T244	This test determines the tensile strength of uncoated seven-wire stress-relieved strand for pre-stressed concrete.
Steel Rebar (Testing)	Sample rebar at various sizes.	This item may be accepted using a Certificate of Compliance. Sample and test at least two steel rebar per job when a Certificate of Compliance is not used.	ASTM A615, A370, AASHTO T244	This test determines the steel reinforcement bar tensile strength and bend capability.

**SECTION VI**

**PROJECT PLANS**

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
9	MONO	CR		2	4

7/2/14  
DATE

REGISTERED CIVIL ENGINEER

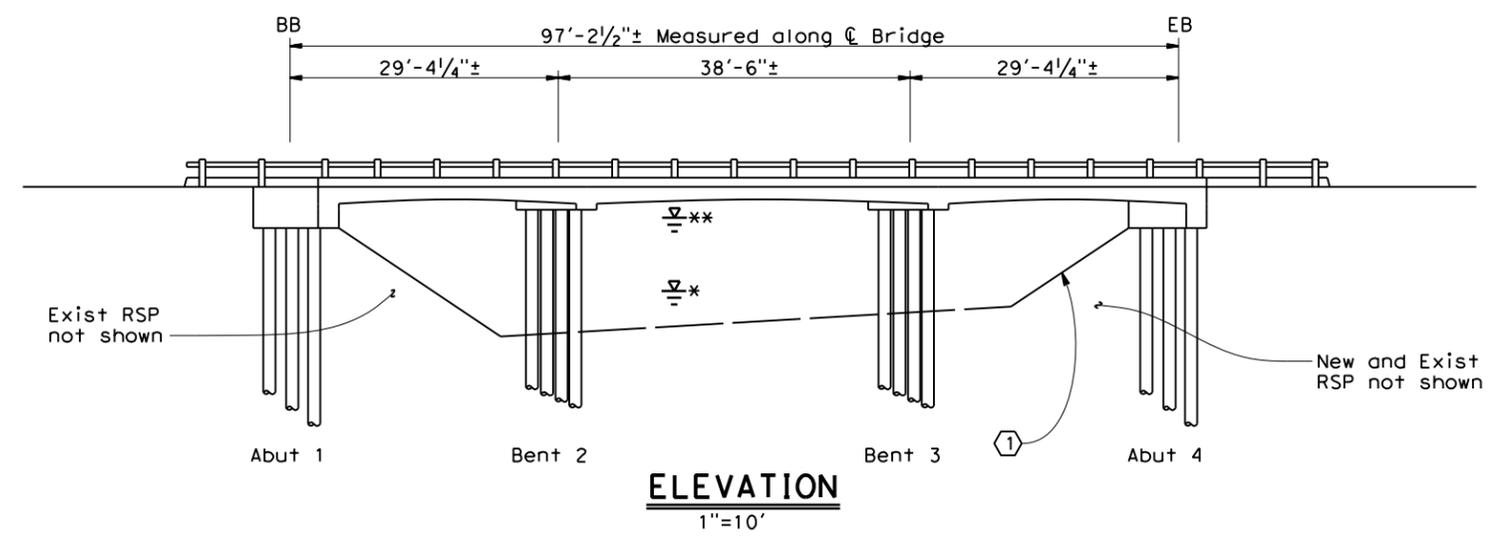
REGISTERED PROFESSIONAL ENGINEER  
Maxwell L. Katt  
No. C74940  
Exp. 12/31/15  
CIVIL  
STATE OF CALIFORNIA

PLANS APPROVAL DATE

*The County or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.*

### BRIDGE MAINTENANCE MEASURES LEGEND

- ① Abutment Scour Hole Maintenance
- ② Spall Repairs
- ③ Timber Post Maintenance
- ④ Timber Railing Paint Maintenance



Legend:

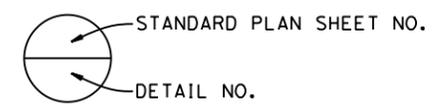
- Indicates direction of traffic flow
- Indicates direction of water flow
- Indicates High Water Elevation per markings on the bridge
- Indicates Ordinary Water Elevation per field observations
- Indicates R/W limits

### QUANTITIES

Prepare Water Pollution Control Program	12	LS
Repair Spalled Surface Area	1	SOFT
Repair Unsound Concrete		CF
Traffic Control System		LS
Repair Post Grout Pockets		LS
Replace Post Grout Caps		LS
Clean and Paint Timber Railing		LS
Rock Slope Protection (Backing No. 1, Method A)	32	CY
Rock Slope Protection Fabric (Class 8)	52	SQYD
Lead Compliance Plan		LS
Temporary Fence (Type ESA)	100	LF

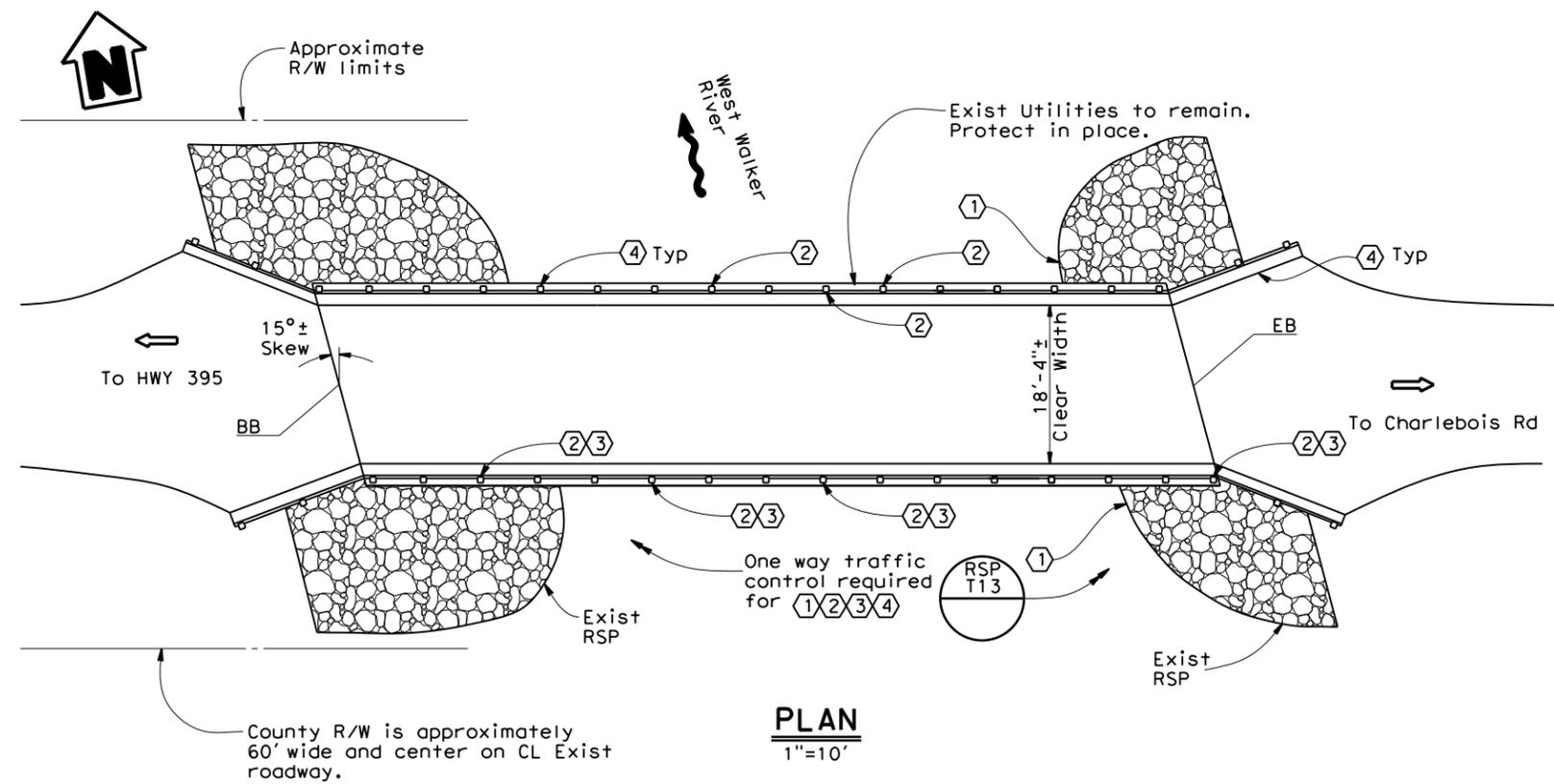
### STANDARD PLANS DATED 2010

- A10A Acronyms and Abbreviations (sheet 1 of 2)
- RSP A10B Acronyms and Abbreviations (sheet 2 of 2)
- A10C Symbols (sheet 1 of 3)
- A10D Symbols (sheet 2 of 3)
- A62C Symbols (sheet 3 of 3)
- RSP T9 Traffic Control System Tables for Lane and Ramp Closures
- RSP T13 Traffic Control System for Lane Closure on Two Lane Conventional Highways



Notes:

- For Abutment Scour Hole Maintenance, see "Slope Protection Details" sheet
- For Spall Repairs, see "Railing Details" sheet
- For Timber Railing Repairs, see "Railing Details" sheet
- No geotechnical exploration or hydraulic analysis performed.



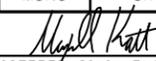
Note:  
The Contractor shall verify all controlling field dimensions before ordering or fabricating any material.

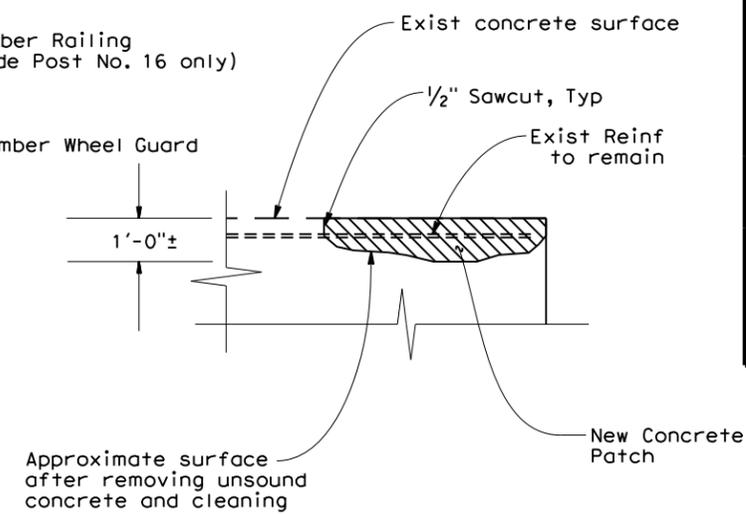
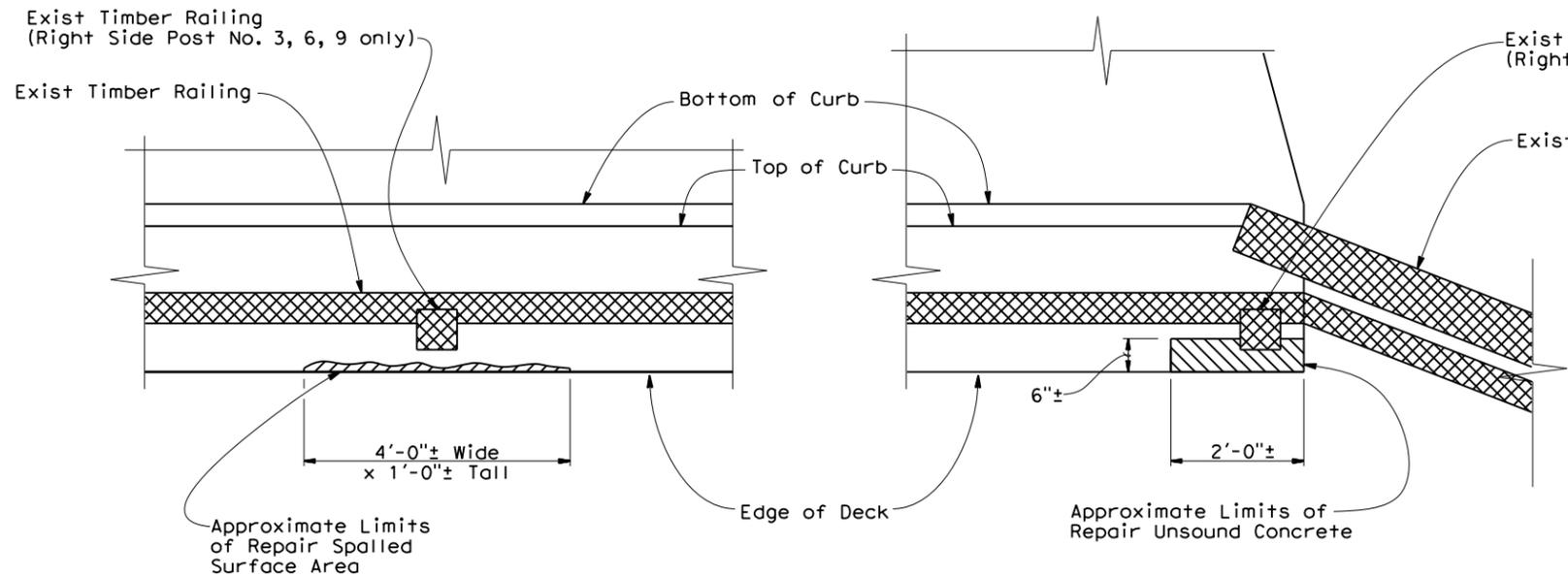
DESIGN OVERSIGHT	DESIGN BY H. Chou	CHECKED R. Ferguson	LAYOUT BY H. Chou	CHECKED M. Katt	BRIDGE NO. 47C-0005	<b>TOPAZ LANE BRIDGE MAINTENANCE PROJECT</b>
SIGN OFF DATE	DETAILS BY H. Chou	CHECKED R. Ferguson	SPECIFICATIONS BY K. Gallagher	PLANS AND SPECS COMPARED X	POST MILES	
DESIGN GENERAL PLAN SHEET (ENGLISH) (REV.03/14/12)						<b>GENERAL PLAN</b>
ORIGINAL SCALE IN INCHES FOR REDUCED PLANS			0 1 2 3			UNIT: 0000
PROJECT NUMBER & PHASE: 0413000100			CONTRACT NO.: 04-4H1601			DISREGARD PRINTS BEARING EARLIER REVISION DATES
						REVISION DATES
						SHEET 2 OF 4

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
9	MONO	CR		4	4
 REGISTERED CIVIL ENGINEER			7/2/14	DATE	
PLANS APPROVAL DATE					
The County or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.					
QUINCY ENGINEERING, INC 11017 Coblerock Drive Suite 100 Rancho Cordova, CA 95670 MONO COUNTY PUBLIC WORKS 74 School St. Bridgeport, CA 93517					



Legend:

	Indicates Repair Spalled Surface Area
	Indicates Clean and Paint Timber Railing
	Indicates Repair Unsound Concrete

### TIMBER POST AND CONCRETE MAINTENANCE PLAN

3/4"=1'-0"

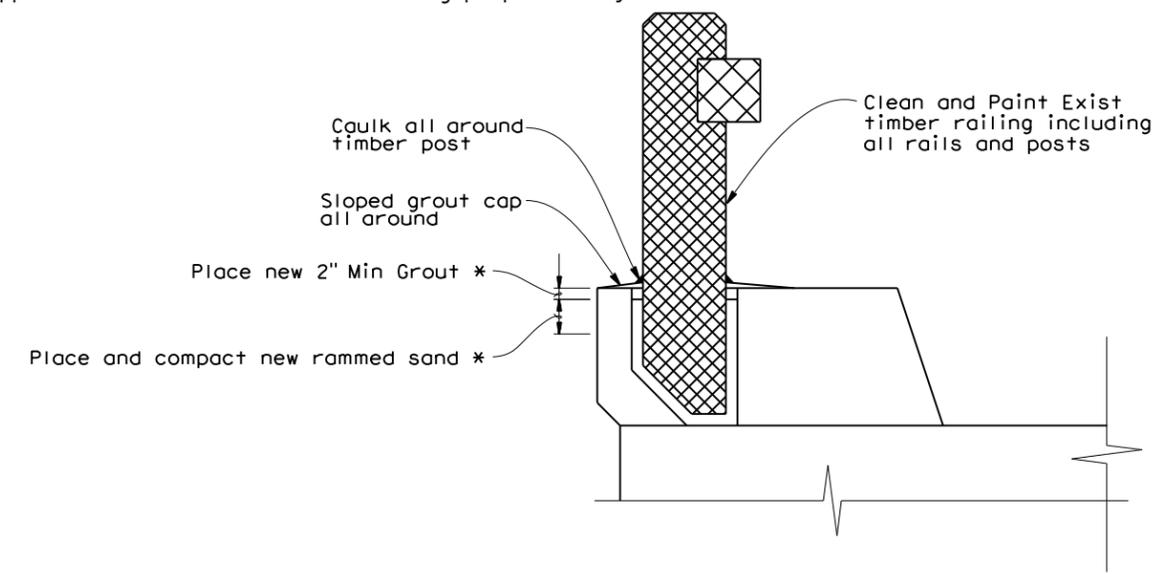
#### Maintenance for Right Side Post No. 3, 6, 9 & 16 only:

1. Install temporary system below bridge as required to prevent debris from entering West Walker River.
2. Repair Spalled Surface Area: Clean and prepare patch area. Apply bond coat of epoxy adhesive to spalled surface. Apply concrete surface patch.
3. Repair Unsound Concrete: All removal edges must be sawcut 1/2" Min depth. All rebar to remain. Construct forms and place concrete to match previously constructed line and grade of bridge/rail.
4. Place new rammed sand and grout into post pocket for railing.
5. Place new sloped grout cap all the way around timber post.
6. Caulk and Paint Timber Railing.

### REPAIR UNSOUND CONCRETE ELEVATION

No Scale

Exact limits to be determined by the Engineer. Approximate limits are for estimating purposes only.

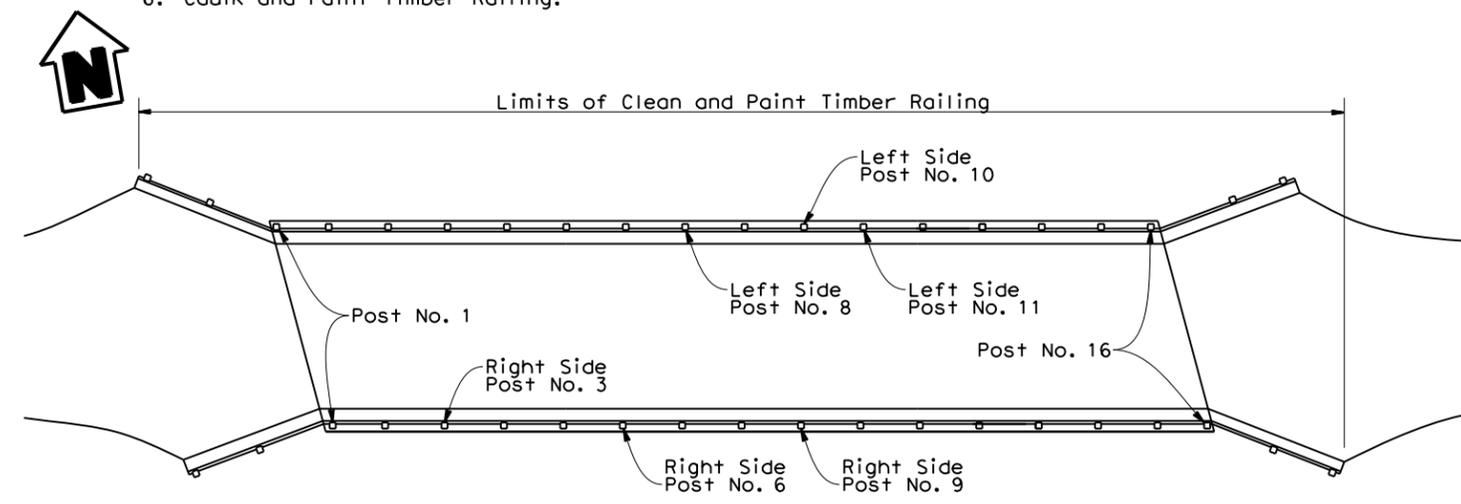


Maintenance shown for all timber posts. For steps with asterisk (\*), perform only on Left Side Post No. 8, 10 & 11:

1. Remove existing grout cap
- 2.\* Remove grout and rammed sand 4" Min below top of curb.
- 3.\* Place and compact new rammed sand.
- 4.\* Place new grout 2" Min depth.
5. Place new sloped grout cap. Grout cap to be 1" Min height at post face and 2" Min width at base, all around
6. Place caulking seal at interface of timber post and top of grout cap.
7. Clean and Paint entire railing system, including all posts and rails.

### TIMBER POST MAINTENANCE DETAIL

No Scale



### RAILING MAINTENANCE PLAN

1"=10'

Note:  
The Contractor shall verify all controlling field dimensions before ordering or fabricating any material.

DESIGN OVERSIGHT	DESIGN BY H. Chou	CHECKED R. Ferguson	<b>PREPARED FOR MONO COUNTY DEPARTMENT OF PUBLIC WORKS</b>	BRIDGE NO. 47C-0005	<b>TOPAZ LANE BRIDGE MAINTENANCE PROJECT RAILING DETAILS</b>
SIGN OFF DATE	DETAILS BY H. Chou	CHECKED R. Ferguson		PROJECT ENGINEER Maxwell Katt	
DESIGN DETAIL SHEET (ENGLISH) (REV.03/14/12)	QUANTITIES BY H. Chou	CHECKED A. Castillo		POST MILE	
ORIGINAL SCALE IN INCHES FOR REDUCED PLANS			0 1 2 3	UNIT: 0000	CONTRACT NO.: 04-4H1601
			PROJECT NUMBER & PHASE: 0413000100	DISREGARD PRINTS BEARING EARLIER REVISION DATES	REVISION DATES: 7/2/2014
			FILE => S:\Client\Mono\Topaz Lane BPMP\CAD\Topaz_t-brdt01.dgn	SHEET 4	OF 4

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