STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY

DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Transportation Laboratory
5900 Folsom Blvd.
Sacramento, California 95819-4612

METHODS FOR SAMPLING HIGHWAY MATERIALS AND PRODUCTS USED IN THE ROADWAY STRUCTURAL SECTIONS

CAUTION: Prior to handling test materials, performing equipment setups, and/or conducting this method, testers are required to read "SAFETY AND HEALTH" in Part 11 of this method. It is the responsibility of the user of this method to consult and use departmental safety and health practices and determine the applicability of regulatory limitations before any testing is performed.

A. OVERVIEW

This method describes the procedures for obtaining representative samples of various highway materials and products that are incorporated in roadway structural sections.

B. PROCEDURES FOR SAMPLING

It is very important that all samples represent all the material in the proportion that it will be used on the project. If the sample does not represent the true conditions of the material under consideration, the subsequent test results and analysis of the data will be erroneous. Representative sampling is defined as the taking of all materials in the proportion that they exist or will be used. Good sampling practices must be followed during the process of obtaining material or products for testing.

The sampler should review the requirements for the tests being performed to ensure that sufficient material is sampled; e.g., California Test 201, Table 1 or California Test 214, Schedule A for aggregates. It is also important to accompany each sample with a properly completed sample identification card (SIC).

The materials or products to be sampled are listed in Parts 1 through 10 of this test method. The following acronyms are used for all references: (1) CT (California Test), (2) ASTM (American Society for Testing and Materials) and (3) AASHTO (American Association of State Highway and Transportation Officials).

This test method addresses acceptable locations that are routinely used for sampling. If it is necessary to sample from other locations, check the references or contact the Transportation Laboratory.

PORTLAND CEMENT CONCRETE

Aggregates	Part 1, Section 3
Cement	Part 2
Water	Part 3
Air Entraining Agent	Part 4
Chemical Admixtures	Part 4
Mineral Admixtures	Part 2
Curing Compounds	Part 5
Fresh Concrete	CT 539

ASPHALT CONCRETE

Aggregates	Part 1, Sections 1-2
Asphalt	Part 6, Sections 1-3
Completed Mix	
Conventional Asphalt Concrete	Part 7, Section 1
Open Graded Asphalt	

AGGREGATE BASE AND SUBBASE

CEMENT TREATED BASE

LEAN CONCRETE BASE

ASPHALT TREATED PERMEABLE BASE

CEMENT TREATED PERMEABLE BASE

PENETRATION TREATMENT

BITUMINOUS SEAL

LIME TREATMENT (SOIL OR AGGREGATE)

POLYMER CONCRETE

PART 1. METHOD FOR SAMPLING AGGREGATE

SCOPE

Part 1 contains the procedures for sampling coarse and fine aggregates at various locations for asphalt concrete, portland cement concrete, aggregate base and sub-base, treated bases, bituminous seals and polymer concrete.

PROCEDURE

1. Sampling at Asphalt Concrete Batch Plants

a. The contractor is required to provide at each aggregate storage bin, a safe and suitable sampling device that will provide a sample of the aggregate as it is being discharged into the weigh hopper. This device normally consists of a pan of sufficient size to intercept the entire cross-section of the discharge stream and hold the required quantity of material without overflowing. A set of rails is necessary to support the pan as it is passed under the discharge stream.

b. Supplemental fine aggregate may be sampled from the feed line or surge tank preceding the proportioning device. Be sure that the selected location is not pressurized.

c. Baghouse dust may be sampled from the bottom of the baghouse, under the feed screw with a sampler that is fixed under the baghouse. The sampler consists of a valve, a section of pipe and a cap for the bottom end of the pipe. To sample, the valve is closed, the pipe cap removed and the pipe is cleaned. Then the cap is replaced and the valve opened. When the pipe is full, the valve is closed, the cap removed, and the sample of dust collected.

   Baghouse dust may also be sampled similarly to supplemental fine aggregate.

2. Sampling at Asphalt Concrete Continuous Mixing Plants

a. For continuous mixing plants, the contractor is required to provide a safe and suitable aggregate-sampling device for obtaining a 27 to 36-kg sample of the combined aggregate while the plant is in full operation. The device shall be located in advance of the point where the aggregate enters the pugmill or drier-drum mixer.

   Some plants are equipped with a sampling device (pan) similar to ones used for batch plant bins, which are passed through the aggregate at one of the stream break points. The pan must be sized to pass completely through the stream before filling. A set of rails is necessary to support the pan as it is passed under the discharge stream.

   Devices used to divert the stream of combined aggregate into a container shall be used with care. Samples taken using diverters that move vertically to cut the stream may not be representative. Side to side diverters tend to be less susceptible to segregation problems as the aggregate stream will normally be layered horizontally. A representative sample may be obtained by diverting the whole stream into a 200 to 300-mm pipe and wasting the first and last quarter of the sample. This method often requires splitting the remaining portion of the sample. Systems that divert the stream of aggregate to a belt for sampling allow the sample size to be selected. Use two templates that conform to the shape of the belt to separate an appropriate size section from the middle half of the diverted aggregate. Sample all the material between the templates.

b. Supplemental fine aggregate and baghouse dust should be sampled per Section 1b and 1c.

***3.* Sampling at Portland Cement Concrete Batch Plants**

The contractor is required to provide safe and suitable facilities, including necessary splitting devices, for obtaining samples of aggregates.

Sampling the belt that feeds the continuous mixer or the batch plant bins immediately preceding the weigh hopper is the most prevalent location for pulling aggregate samples. Use two templates that conform to the shape of the belt to separate an appropriate size section. Sample all the material between the templates. The aggregate should be completely removed from a section of the stopped conveyor belt.

Many plants are equipped with large storage bins (say 75 to 115 m^3). On small projects, samples from the belt that feeds the bins may not be representative of the aggregate used on the project if the bins have much material in them. In this case, the bins should be emptied prior to sampling. To eliminate this problem, a request that the plant operator keeps the

bins empty or near empty prior to sampling is recommended.

4. Sampling from Roadway (Bases & Subbases)

Obtain at least three approximately equal increments, selected at random transversely across the width of the roadway, after the material has been spread and prior to compaction, and combine to form a field sample that is equal to or in excess of the minimum mass required. Take all increments from the roadway for the full depth of the material, taking care to exclude any underlying material.

5. Sampling from Windrows (Bases & Subbases)

Site selections should be made within the middle half of the deposit. The preferred method for obtaining a sample from a windrow is to sample the entire cross-section of windrow before water is added. This can be done using steel plates or plywood to isolate the initial sample or the following procedure.

Remove a cross section of the windrow at least the width of one shovel. From either remaining face, select an appropriate distance to provide the needed sample and make a vertical cut. Be sure to include the material that sluffed after removing the cross section. Quarter or split to the required size.

6. Sampling Fine Aggregates from Transportation Units

Samples from a hauling vehicle shall be taken from at least three points, a minimum of 150 mm below the surface, distributed over the vehicle. The sample location shall be established at a distance from the edge that is approximately one-third the width of the vehicle. Obtain approximately equal amounts of material from each point and combine to form a field sample, which is equal to or in excess of the minimum mass required.

NOTES:

1. Sampling Stockpiles

In some cases, it may be necessary to sample from stockpiles for potential source testing. In such cases, the procedure should ensure that segregation does not introduce a serious bias in the results. Do not sample stockpiles for mix design purposes.

At times, "one sized" materials such as 9.5-mm chips are stockpiled at the job site. This type of material may be sampled for acceptance testing from the stockpile.

In sampling material from stockpiles, it is very difficult to ensure unbiased samples. This is due to segregation which occurs when material is stockpiled and coarser particles roll to the outside base of the pile. For coarse or mixed coarse and fine aggregate, every effort should be made to use a loader to develop a separate, small sampling pile composed of materials drawn from various levels and locations in the main pile. Drag off the top half of the new pile. Take a shovel full of material from several locations of the remaining half of the pile.

Where power equipment is not available, samples from stockpiles should be made up of at least three increments, one taken from the top third, at the midpoint, and at the bottom third of the volume of the pile. A board shoved into the pile just above the sampling point can prevent further segregation.

In sampling stockpiles of fine aggregate, the outer layer, which may have become segregated, should be removed and the sample taken from the material beneath. If available, sampling tubes (with a diameter of approximately 30 mm and a minimum length of 1.8 m) may be inserted into the pile at random locations to extract a minimum of five increments of material to form the sample.

Potential source test samples can be taken from the stream of material at the end of the moving belt that discharges onto the stockpile. These belt systems can be lowered and moved back and forth to assist sampling. Care must be exercised to intercept the entire discharge stream without overflowing the sampling device. Quartering or splitting of the samples may be required.

2. Quartering or Splitting Samples

As a consequence of some sampling procedures, excess material is obtained to ensure that representative samples are obtained. It is practical to reduce the amount to a sample size equal to or slightly in excess of the minimum mass required before transporting or shipping to the laboratory. The use of a sample splitting device is preferred. However, hand quartering is acceptable if carefully performed.

a. Splitting Samples with Riffle Splitters

Sample splitters shall have an even number of equal-width chutes, but not less than a total of eight for coarse aggregate and twelve for fine aggregate, which discharge alternately to each side of the splitter. The chutes shall be fixed (not adjustable). The minimum width of the individual chutes shall be approximately 50 % greater than the size of the largest particles in the sample. The splitter shall be equipped with two receptacles to hold the two halves of the sample following splitting. It shall also be equipped with a hopper or straightedge pan, which has a width equal to or slightly less than the overall width of the assembly of chutes by which the sample may be fed at a controlled rate to the chutes. The splitter and accessory equipment shall be so designed that the sample will flow smoothly without restriction or loss of material.

Procedures for splitting samples with riffle splitters are as follows:

(1) If the sample has free moisture on the particle surfaces, the entire sample must be dried to at least the surface-dry condition. Use temperatures that do not exceed those specified for any of the tests contemplated.

(2) Thoroughly mix the sample and spread it evenly across the pan or hopper.

(3) Open the hopper gate or pour the material from the pan so that the materials flows evenly through all the chutes. Control the rate of discharge as necessary to maintain a continuous flow of materials through the chutes.

(4) Continue to split or combine successive portions until the desired sample size is achieved.

b. Splitting with the Use of Quartering Canvas

For samples weighing over 45 kg:

(1) Place the sample in a conical pile in the center of the canvas. Mix the sample by shoveling material from around the bottom edges to the center of the pile. Place each shovel full so that the material spills over the cone equally in all directions.

(2) Flatten the cone with the shovel, spreading the material to a circular layer of uniform thickness.

(3) Insert a stick (or pipe or shovel handle) under the canvas at the center of the pile and lift both ends, dividing the sample into two equal parts. Remove the stick, leaving the canvas in a folded position.

(4) Insert the stick (or pipe or shovel handle) under the canvas at the center of pile at right angles to the first division and again lift both ends, dividing the sample into four equal parts. In lieu of dividing by use of a stick, a square point shovel may be used to divide the sample into four equal parts.

(5) Discard two diagonally opposite quarters, being careful to clean all the fines from the canvas.

(6) Repeat Steps (1) through (5), combining split portions as necessary until the desired sample size is achieved.

For samples weighing 12 to 45 kg:

(1) Place the sample on the canvas and mix by alternately lifting the corners of the canvas and pulling them over the sample as if preparing to fold the canvas diagonally.

(2) Flatten and quarter as above.

For samples weighing less than 12 kg:

(1) Place the sample on the canvas or a clean sheet of paper. Mix thoroughly with a trowel and form into a conical pile.

(2) Flatten the pile by pressing downward with the trowel.

(3) Separate into quarters with the trowel and discard diagonally opposite quarters.

PART 2. METHOD FOR SAMPLING HYDRAULIC CEMENT AND MINERAL ADMIXTURES

SCOPE

Part 2 contains the procedures for sampling hydraulic cement and mineral admixtures (flyash and pozzolans).

PROCEDURE

1. Sampling at the Concrete Plant

Safe and suitable facilities for sampling cement and mineral admixtures shall be provided at the weigh hopper, or in the feed line immediately in advance of the hopper.

a. Normally a molasses bung is installed in the trough feeding the weigh hopper, the weigh hopper itself, or a cement holding hopper if so equipped. If cement and flyash samples are obtained in this manner, the plant must be equipped with all appropriate safety measures including, but not limited to ladders, stairs, handrails, belt and pulley guards, and housekeeping considerations.

b. On some plants, it would require extensive plant modification in order to make this sampling location safe. In this case, an adequate sample can be obtained by dropping at least 90 kg of cement or mineral admixture from the weigh hopper into the clean bucket of a loader. It can then be lowered to ground level where the material can be sampled. A minimum of 3 equal scoops shall be taken to represent a sample. Take scoops at different locations, but avoid sampling near the edges of the loader bucket.

2. Sampling Packaged Cement with a Tube Sampler

Insert the tube sampler diagonally into the valve of the bag (520 mm for packaged cement) and place the thumb over the air hole. Then withdraw the sampler. Take a sample from one bag for each 4.5 tonne or fraction thereof.

SAMPLE CONTAINER AND PREPARATION

Place samples directly into plastic bags (double bag) and seal immediately after filling and eliminating excess air.

PART 3. METHOD FOR SAMPLING WATER

SCOPE

Part 3 contains the procedures for sampling water to be used in portland cement concrete, lean concrete base, cement treated permeable base, and lime treatment.

PROCEDURE

1. Collecting Samples from Distribution Systems

Flush lines sufficiently to ensure that the sample is representative of the supply, taking into account the diameter and length of the pipe to be flushed and the velocity of flow.

2. Sampling Wells

Collect samples from wells only after the well has been pumped sufficiently to ensure that the sample represents the ground water source. Sometimes it will be necessary to pump at a specified rate to achieve a characteristic draw down.

3. Sampling Rivers and Streams

If equipment is available, take an integrated sample from top to bottom at mid-distance horizontally in the stream in such a way that the sample is representative of the river or stream. If only a grab sample can be collected, take it in the middle of the stream and at mid-depth.

4. Sampling Lakes and Reservoirs

Lakes and reservoirs are subject to considerable variations from normal causes such as seasonal stratification, rainfall, runoff, and wind. Choose location, depth, and frequency of sampling depending on local conditions and the purpose of the sample. Avoid surface scum.

5. Sampling Water in Concrete or Lime Mixing Plants

Sample from the plant facilities from the line that feeds the water into the mix.

SAMPLE CONTAINER, PREPARATION AND PRESERVATION

The sample container shall be a clean 2-L plastic jug with a lined sealed lid and shall be filled and rinsed two or three times with water being collected, prior to obtaining the sample. Fill the container to the top, refrigerate or ice to approximately 4°C, and deliver to the laboratory within 24 h.

PART 4. METHOD FOR SAMPLING AIR-ENTRAINING AGENTS AND CHEMICAL ADMIXTURES

SCOPE

Part 4 contains the procedure for sampling air-entraining admixtures and chemical admixtures for use in portland cement concrete and lean concrete base.

PROCEDURE

1. Liquid Admixtures

All liquid admixtures shall be thoroughly agitated (without introducing air) immediately prior to sampling. Samples shall be placed and shipped in clean, moisture proof, airtight cans or plastic bottles.

a. Sampling at the Manufacturing Source

A 1-L sample should be taken from the mix tank at the conclusion of the mixing operation.

b. Sampling from Large Holding Tanks or Bulk Storage Tanks

Sample equally from the upper, intermediate and lower levels by means of drain cocks in the sides of the tanks or a weighted sampling bottle fitted with a stopper that can be removed after the bottle is lowered to the desired depth. Each grab sample shall have a volume of at least 500 mL. A minimum of three grab samples shall be taken, combined and mixed thoroughly, and the resultant mixture sampled to provide a composite 1-L sample.

c. Samples Obtained from Drums or Other Smaller Containers

A 1-L sample shall be obtained to represent one or more selected drums or containers.

d. Sampling at Concrete Plants

Samples of admixtures as used in the mix shall be taken from a sampling valve located on the liquid admixture dispensing system.

Flush the valve by and discard a minimum of 1 L of admixture. Then take a 1-L sample.

2. Non-Liquid Admixtures

Samples shall be packaged in moisture-proof, airtight containers.

a. Sampling from Bulk Storage Tanks or Transportation Units

Take a minimum of four 0.5-kg grab samples from different locations. Combine and thoroughly mix the grab samples. Split the combined material to obtain a resultant composite sample of 1 kg or more.

b. Samples Obtained from Packages

Samples shall be obtained by means of a tube sampler. Insert the tube sampler diagonally into the material, transversing the package. Place the thumb over the air hole. Then withdraw the sampler. Repeat to obtain at least 1 kg. Take one sample per lot.

PART 5. METHOD FOR SAMPLING CONCRETE CURING COMPOUNDS

SCOPE

Part 5 contains the procedures for sampling-curing compounds used to cure portland cement concrete and lean concrete base.

PROCEDURE

All curing compounds shall be thoroughly agitated (without introducing air) immediately prior to sampling. Samples shall be placed and shipped in moisture proof, airtight, clean cans or plastic bottles.

1. Sampling at Manufacturing Source

A 3-L sample should be taken from the mix tank at the conclusion of the mixing operation.

2. Sampling from Large Holding Tanks or Bulk Storage Tanks

Sample equally from the upper, intermediate and lower levels by means of drain cocks in the sides of the tanks or a weighted sampling bottle fitted with a stopper that can be removed after the bottle is lowered to the desired depth. Each grab sample shall have a volume of at least 500 mL. A minimum of three combined grab samples shall be taken, and mixed thoroughly, and the resultant mixture sampled to provide a composite 1-L sample.

3. Samples Obtained from Drums or other Smaller Containers

A 1-L sample shall be obtained to represent one or more selected drums or containers.

PART 6. METHOD FOR SAMPLING BITUMINOUS MATERIALS

SCOPE

Part 6 contains the procedures for sampling of liquid, semi-solid, or solid bituminous material at various locations.

PROCEDURE

Except for emulsions, all asphalt samples shall be placed in metal cans with screw top lids.

1. Sampling at the Manufacturing Source

Bituminous materials in bulk storage tanks equipped with or without mechanical agitators shall be sampled by using existing sampling valves or taps at the lower locations of the tank. Withdraw a 1-L sample after taking and discarding a minimum of 4 L of material.

2. Sampling From Tank Cars, Tank Trucks, Distributor Trucks or Re-circulating Storage Tanks

Each tank shall be equipped with a sampling valve. The inlet to the valve shall be located a minimum of 0.3 m from any wall. Withdraw a 1-L sample after taking and discarding a minimum of 4 L of material. The sample may be obtained from the spray bar of distributor trucks at mid-load during operations. An acceptable alternative is as follows:

The sample shall be secured with an oil thief. A clean oil thief shall be lowered to the bottom of the tank and withdrawn at such a rate that when removed from the asphalt, some unfilled space remains in the thief. To prevent contamination of the sample by material remaining in the thief from previous sampling or from traces of solvents used in cleaning, the first sample removed with the thief shall be poured back into the tank. At least two washings of the thief by the hot asphalt should be carried out before a final sample is obtained since a very small amount of contaminant can make marked changes in penetration.

After "rinsing" the thief with the material to be sampled, a sample shall be drawn and poured into a clean 1-L screw-top can. After pouring the sample, the lid shall be screwed on as tightly as possible. Any asphalt spilled on the can shall be wiped off at once. Under no circumstances shall the can be placed in a bucket of solvent in order to remove spilled asphalt.

3. Sampling from Asphalt Concrete Plant Feed Line

The contractor is required to provide a suitable sampling device in the asphalt feed lines connecting plant storage tanks to the asphalt weighing system or spray bar. The sampling device shall consist of a 12 or 19-mm valve constructed in such a manner that a 1-L sample may be withdrawn slowly at any time during plant operations. The valve shall be maintained in good condition, and if it fails to function properly, it shall be replaced. The sampling device shall be readily accessible and in an area free of dangerous obstructions and shall be between 610 and 760 mm above the platform. A drainage receptacle shall be provided for flushing the device prior to sampling. It is important to flush the sample valve plumbing with a minimum of 4 L of material prior to taking a 1-L sample.

4. Sampling Asphalt Emulsion or Polymer Modified Asphalt Emulsion at the Job Site

Take a 2-L sample in a plastic jug from the distributor truck at mid-load during operations.

5. Sampling Solid or Semi-Solid Material (Crack Filler)

Sample the smallest prepackaged container available. One package per lot.

PART 7. METHOD FOR SAMPLING BITUMINOUS PAVING MIXTURES

SCOPE

Part 7 contains the procedures for sampling mixtures of bituminous materials and mineral aggregate as prepared for use in paving.

PROCEDURE

Cardboard boxes are usually acceptable containers for DGAC mix samples. Metal containers should be used whenever the asphalt coating is thick enough to flow or pool during shipment or reheating for further testing; i.e., OGAC or rich DGAC. Anti-stick or release agents may be used on tools if the tool is wiped before sampling. A minimum of 6.5 kg is required for extraction and grading tests, 13 kg for test maximum density, extraction, and grading. Procedures for sampling plant-mixed bituminous mixtures are described below:

1. Conventional Asphalt Concrete

Take a composite sample from at least four locations in a line transversely across the mat immediately behind the paver. All samples should include the full depth of the material, taking care to exclude any underlying material. The SIC must identify the four locations as one sample regardless of the number of containers.

2. Open Graded Asphalt Concrete

Sample OGAC either from hauling vehicles at the plant or from the mat behind the paver before initial or breakdown compaction of the mat. The sample size should be sufficient to yield the amounts noted in the required test methods without further splitting.

a. Sampling at the plant

Take approximately equal increments of OGAC from four different locations in the hauling vehicle. Samples should be taken at least 0.3 m below the surface. The SIC must identify the four locations as one sample regardless of the number of containers.

b. Sampling from the mat

Take a composite sample of OGAC in the same manner as conventional asphalt concrete, but use metal containers.

3. Asphalt Treated Permeable Base

Samples shall be obtained from the paver receiving hopper. The sample locations shall be established at a distance from the edge of the hopper that is approximately one-third the width of the hopper, approximately 100 mm below the surface.. Each sample of ATPB shall consist of two nearly full 1-L cans with friction lid. Take approximately equal increments of material from four different locations in the hopper to fill the container(s).

4. Modified Asphalt Concrete Mixes (rubber, fiber, etc.)

Samples shall be obtained in the same manner as conventional asphalt concrete, unless otherwise noted in the Special Provisions for the contract on which it is to be used.

NOTE: To determine asphalt content by the nuclear gage, 9-kg samples are required.

PART 8. METHOD FOR SAMPLING LIME

SCOPE

Part 8 contains the procedures for sampling lime from conveyors, silos and distribution trucks.

PROCEDURE

1. Sampling at the Production Plant.

Samples shall be taken from the conveyor system with the conveyor stopped. Samples should be scooped (grab samples) from the sample port opening.

When sampling granular lime for grading analysis the entire cross-section of the conveyor shall be taken. Samples for "mix design" purposes shall consist of a minimum of two

2. Sampling at Job Site.

Samples shall be taken from the distributor truck during application. If lime slurry is used, obtain a minimum of two 1-L cans having a friction lid. Use care to assure uniform distribution of the solids before sampling.

If quicklime or hydrated lime is used, obtain a minimum of 1 kg in a can having a friction lid.

PART 9. METHOD FOR SAMPLING NATIVE MATERIAL

SCOPE

Part 9 contains the procedures for sampling native material that is to be treated with lime.

PROCEDURE

The native materials to be lime treated shall be sampled by means of test holes (augured, dug with post-hole digger or shovel). The test holes shall be sampled to the depth of proposed treatment. Separate samples shall be taken to represent different material types so that all material types are represented. Reference the location of each sample.

PART 10. METHOD FOR SAMPLING RESINS, PROMOTERS AND INITIATOR USED IN POLYMER CONCRETE

SCOPE

Part 10 contains the procedures for sampling polyester resins and high molecular weight methacrylates and their promoters and initiators that are used in polymer concrete.

PROCEDURE

1. Sampling Storage Tanks, Tank Trucks, and Tank Cars

Sample equally from the upper, intermediate and lower levels by: (1) means of sampling taps located equal distance throughout the height of the tanks; (2) a weighted sampling bottle fitted with a stopper that can be removed at the desired depth; or (3) a thief sampler. Combine the upper, middle and lower samples to provide a composite sample.

2. Samples Obtained from Drums or other Smaller Containers (18 L or Larger)

Samples from drums and smaller containers should be obtained using a tube sampler. The sampler shall be designed so that it will reach to within 3 mm of the bottom of the drum or container. Thoroughly agitate the material in the drum or container. Withdraw some liquid with the tube sampler. Rinse the tube with the liquid by holding it horizontally and turning it so the liquid comes in contact with the inside of the tube. Discard the rinse liquid and allow the tube to drain. Obtain a full depth sample by inserting the tube with the upper end open. When the tube reaches the bottom, place the thumb over the hole and remove the tube quickly.

3. Sample Size and Type of Containers

Minimum composite sample sizes shall be:

Polyester Resin - 3.7 L
High Molecular Weight Methacrylate - 2 L
Promoters - 100 mL
Initiators - 100 mL

Containers shall be tin cans with screw-neck or friction top lids.

PART 11. SAFETY AND HEALTH

Prior to handling, testing or disposing of any waste materials, testers are required to read: Part A (Section 5.0), Part B (Sections: 5.0, 6.0 and 10.0) and Part C (Section 1.0) of Caltrans Laboratory Safety Manual. Users of this method do so at their own risk.

1. Sampling Aggregates at Portland Cement Concrete and Asphalt Concrete Plants

Beware of hot aggregate and equipment.

Gloves and safety glasses should be worn when sampling.

Beware of dust.

Stairs and/or ladders must meet CAL-OSHA requirements.

Stairs, ladders and sampling platforms must be kept clean.

Buckets and bags of aggregate cannot be carried down the stairs or ladders safely. A rope and pulley system or dump tube should be used.

Proper lifting procedures should be practiced.

Each drive motor for the plant aggregate feeder belt(s) must be equipped with a power source de-energizer before samples can be taken. The sampler cannot take the risk that the feeder belt will be inadvertently started while aggregate sampling is in progress. This power disconnect must be within sight of the sampling location or be equipped for a Caltrans furnished padlock. Do not use the contractor's padlock.

2. Sampling Bituminous Materials

Beware of hot pipes, tanks, equipment, etc.

Smoking is not permitted in the vicinity of storage tanks because there is always the possibility of flammable vapors in these tanks. These vapors may flash if the correct mixture with air should occur and a spark or other ignition source if present.

Gloves and safety glasses should be worn when sampling.

Sampling valves should be located no higher than 800 mm above the ground or sampling platforms.

Always open sampling valves slowly to avoid splatter.

Access openings to underground asphalt storage tanks must be covered or guarded against accidental entry.

Good housekeeping is a must.

Beware of moisture inside of sample cans. Hot asphalt or asphalt concrete placed in cans containing moisture and capped can explode when reheated.

3. General

Notify the plant operator prior to taking samples.

The District Weights and Measures Coordinator will assist in determining that the plant is in safe condition and/or provide a copy of the plant safety inspection sheet, Form CEM-4202.

The plant owner must practice good housekeeping at all times. CAL-OSHA

requires “aisles and walkways to be at least 610 mm wide with 2 m of head room, protected against slipping and free of oil, grease, or water and dangerous obstructions and debris. Ditches, pits, excavations and surfaces in poor repair shall be guarded. Leaks shall be controlled and spills cleaned up promptly.”

Beware of the hazards of mixing chemical components such as resins, promoters, and initiators used for polymer concrete.

REFERENCES:

ASTM Designations: C 183, C 260, C 494, C 702, D 75, D 140, E 300
AASHTO Designations: T 2, T 40, T 248
Standard Method for the Examination of Water and Waste Water. "COLLECTION AND PRESERVATION OF SAMPLES"; American Public Health Association, American Water Works Association, Water Pollution Control Federation.

End of Text
(California Test 125 contains 13 pages)