

Memorandum

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To: DEPUTY DISTRICT DIRECTORS, Construction
DEPUTY DIVISION CHIEFS, Structure Construction
CONSTRUCTION MANAGERS
SENIOR CONSTRUCTION ENGINEERS
RESIDENT ENGINEERS

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File: Division of Construction
CPD 05-13

From: ROBERT PIEPLOW
for Chief
Division of Construction



Subject: Effects of Assembly Bill 574, Recycled Concrete

Assembly Bill 574 (Chapter 693, Statutes of 2005) – Recycled Concrete will become law on January 1, 2006. This law is intended to encourage the use of recycled concrete and establishes a statutory definition of “recycled concrete” as prescribed in the 2003 edition of the *Greenbook Standard Specifications for Public Works*. The law prohibits recycled concrete from being offered, provided, or sold to the Department of Transportation (Department) for any use (including, but not limited to, any project under its affiliation, contract authority, or oversight responsibility) unless specifically requested and approved by the Department.

The Department will need to provide a quality assurance procedure to ensure that such materials, when prepared for delivery, are in fact in compliance with the provisions of the law prohibiting the use of recycled concrete on Department projects.

Several years ago, the Department discovered several instances where concrete production plant operators had blended plastic concrete that was returned from a previous delivery with fresh concrete that was to be delivered to Department projects. To protect against future similar occurrences, the Department modified the certification process requirements in California Test 109 to ensure the accuracy of the shipping receipt.

Existing Quality Assurance

Department guidelines for portland cement concrete plant inspection as outlined in Section 4-9003A, “Proportioning and Mixing Operations,” of the *Construction Manual* include:

- Verify that batch controllers that have the ability to provide for an estimate of returned concrete, for rebatching; must have that feature disabled.
- Verify that delivery trucks are completely empty before loading. Ready-mix trucks can be verified to be empty by spinning the mixing drum in reverse immediately before loading.

Plant inspection is typically done intermittently and in conjunction with other field sampling and testing duties.

New Plant Inspection Guidelines

Recycled concrete will probably become a standard industry practice, and will significantly increase the probability of the Department receiving recycled concrete in the future. To avoid the receipt of recycled concrete, the Department must be diligent about concrete plant inspections during the production of concrete for pavements and structures to be placed on Department projects. Inspections require the following actions:

- Ensure that workload forecasts for concrete plant inspections properly reflect the safeguard option of 100 percent plant inspection for critical items
- Perform 100 percent plant inspection during production of critical items, and
- Prohibit the use of recycled concrete in concrete produced for Department projects.

The current definition of recycled concrete as defined by the 2003 edition of the *Greenbook Standard Specifications for Public Works* includes:

1. Returned plastic concrete with a design strength of 2,000 psi or greater that has not attained initial set. A maximum of 15 percent by volume of returned plastic concrete can be combined with fresh concrete. Returned plastic concrete shall be proportioned by volume and each weighmaster certificate shall include weights of materials for fresh concrete and the volume of returned concrete for each batch of recycled concrete.
2. Reclaimed returned concrete materials derived from unhardened concrete. The unhardened concrete is processed to separate reclaimed aggregates (RA) and reclaimed water (RW). RA may be further separated into reclaimed sand and reclaimed coarse aggregates. RA may include trace cementitious materials. A maximum of 30 percent by weight of total aggregate may be used. RW generally consists of cementitious material, suspended fines, water, and may include residual admixtures. A maximum of 35 percent by weight of total water may be used. RA and RW shall be proportioned by weight.
3. Reclaimed hardened concrete made by crushing waste portland cement concrete. A maximum of 30 percent by weight of total aggregate may be used. Aggregate made from reclaimed hardened concrete shall be proportioned by weight.

If you have any questions or comments regarding this construction procedure directive, contact Division of Construction, Austin Perez, Pavement Engineer, at (916) 227-5705 or Basil Miranda, Production Plant Quality Coordinator, at (916) 227-5707.