

REQUEST FOR APPROVAL

To: **Howard Levenson**
Assistant Director, Materials Management and Local Assistance Program

From: **Brenda Smyth**
Division Chief, Statewide Technical and Analytical Resources Division

Request Date: **April 29, 2010**

Decision Subject: **Approval of Scope of Work and of Interagency Agreement (IAA) with Caltrans for the "TDA Seismic Retaining Wall Shake-Table Test and Analysis Using Tire Derived Aggregates (TDA) as Backfill" Study (Tire Recycling Management Fund, FY 2010/11)**

Action By: **May 30, 2010**

Summary of Request:

Staff requests approval of the Scope of Work and of Caltrans as contractor for an Interagency Agreement (IAA) to conduct a "TDA Seismic Retaining Wall Shake-Table Test and Analysis using Tire Derived Aggregates (TDA) as Backfill" behind a typical Type I retaining wall.

Recommendation:

Staff recommends that CalRecycle enter into the IAA with Caltrans using Fiscal Year (FY) 2010/11 funds allocated to Civil Engineering Application for waste tires in the Research section of the Five-Year Tire Plan. This IAA will be funded at \$407,922 for the tasks outlined in the attached Scope of Work (Attachment A).

Assistant Director Action:

On the basis of the information and analysis in this Request for Approval and the findings set out above, I hereby approve the IAA with Caltrans to Complete the "TDA Seismic Retaining Wall Shake-Table Test and Analysis using Tire Derived Aggregates (TDA) as Backfill" in an amount not to exceed four hundred seven thousand nine hundred twenty-two dollars (\$407,922), subject to passage of the FY 2010/11 Budget Act and availability of funds appropriated to this program.

Dated: _____

Howard Levenson
Assistant Director

Background Information, Analysis, and Findings

CalRecycle has been working with Caltrans to revise its current retaining wall design to incorporate TDA as an option in its design specifications. This work was initiated in 2000 when CalRecycle partnered with Caltrans to complete two pilot projects where the benefits of using TDA as lightweight backfill were demonstrated. One major benefit of using TDA backfill was the significant cost savings from the reduced concrete and/or steel that will be required in a Type I wall due to the lighter weight TDA backfill compared to soil. Based on success of the pilot projects, in 2009 staff worked with Caltrans to revise its existing design into a new (Type 1T) design specification that incorporates TDA.

As part of Caltrans' new design standards, Caltrans is now using a design method known as Load and Resistance Design Factor (LRDF). This new standard is being used to redesign all Caltrans retaining walls, as required by the American Association of State Highway and Transportation Officials. As part of this new LRDF redesign process, Caltrans is required to address certain seismic conditions and factor them into their new wall design. Unfortunately, there was no data available on how retaining walls react during an earthquake. To acquire the necessary design data related to seismic shaking, in 2009 Caltrans contracted with University of California, Davis to conduct actual field testing to validate their new retaining wall design.

The University of California, Davis has just completed its field seismic shake-test and is currently evaluating the data. However, the testing conducted so far has included only soil backfill. Therefore the data obtained from the tests in this new agreement will address the effect a lightweight and compressible TDA backfill may have on a retaining wall. While conducting the first part of the pilot projects allowed CalRecycle to get information regarding the static loading of TDA against a retaining wall, it has not provided the necessary seismic data to adequately complete the redesign of the Type 1T retaining wall. In order to complete the new redesign of the Type 1T wall using the federally mandated LRDF standard, data must be obtained on how TDA will affect a retaining wall during an earthquake. CalRecycle currently has the opportunity to obtain this data by having the University of California, Davis conduct another shake-test using TDA behind a Type 1 wall, and also receive oversight assistance from the Caltrans engineers that also managed the previous University of California, Davis study. This IAA will allow CalRecycle to partner with Caltrans to conduct this necessary testing to complete the redesign of the new Type 1T retaining wall.