



## Florida Department of Transportation

JEB BUSH  
GOVERNOR

State Materials Office • Materials Research Park  
5007 NE 39th Avenue • Gainesville, FL 32609  
Phone (352) 955-6600 • Fax (352) 955-6613

JOSÉ ABREU  
SECRETARY

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**This Memo Has Expired**

**DCE MEMORANDUM NO. 09-05**  
**MATERIALS BULLETIN NO. 04-05**  
(FHWA Approved: 5/26/05)

**TO: DISTRICT CONSTRUCTION ENGINEERS  
DISTRICT MATERIALS ENGINEERS**

**FROM:** *For* Ananth Prasad, P.E., Director, Office of Construction  
Thomas O. Malerk, P.E., Director, Office of Materials

**SUBJECT: USE OF RAP MATERIAL IN ROADWAY CONSTRUCTION  
MB 1-00**

All RAP materials used in roadway construction will not be allowed in the following areas:

1. Below the water table elevation.
2. Top 6" of slopes and shoulders that will have grass or other type of vegetation establishment.
3. MSE Wall backfill.

### Requirements for RAP Material

1. If the source of RAP material is an identifiable Department project, the contractor shall certify the source.
2. When the RAP material comes from off project sources, a minimum of three (3) Synthetic Precipitation Leaching Procedure (SPLP) tests must be performed on this material by a FDEP certified or approved laboratory in accordance with Environmental Protection Agency (EPA) Test Method 1312 contained in their SW-846 Manual, 'Test Methods for Evaluating Solid Wastes Physical/Chemical Methods'. In addition, RAP material generated on the project must be sampled at a frequency of 1 per 16 lots, and one (1) SPLP test performed on the sample.

3. The RAP material requirements shall meet the specifications 283 and all Florida Department of Environmental Protection (FDEP) requirements.
4. RAP material shall only be placed above the water table. Contractor should submit a letter stating the proposed location of the RAP material.

All of the above results should be submitted to the District Materials Engineer for approval at least 14 days prior to the field operation. The DME may request samples of the RAP material for verification purposes.

**A) Embankment Construction**

There are two methods of incorporating RAP into the embankment:

1. Use a mixture of soil and RAP
2. Use alternative layers of soil and RAP

a. Soil and RAP Mixture

The contractor may dump the RAP material at the location of placement and spread uniformly by approved methods to a maximum layer thickness of 4". This 4" maximum layer of RAP can be mixed with loose soil about 8" to 10" thick layer. The total RAP and other embankment material shall not exceed 12" per lift after mixing and compaction if the contractor can demonstrate that the density of the mixture can be achieved. Mixing shall be performed using rotary tillers or other equipment meeting the approval of the engineer. The Engineer will determine the order in which to spread the two materials. Both materials shall have to be mixed to the full depth. The contractor should continuously check the thickness to ensure that the finished layer will have the thickness and shape required by the typical section. Successful completion of a test section of 300' – 400' long should demonstrate the feasibility of this construction method.

Embankment construction shall be performed according to specifications 120-8. Compaction Requirements of the soil and RAP mixture shall meet specifications 120-9.

b. Alternate Soil and RAP Layer Construction

Soil with minimum LBR value of 40 is recommended to prevent failure during compaction of the overlying firm RAP layer in such a way that no undue distortion will occur.

Alternate lifts of RAP layer and Soil layer shall be constructed as follows. The maximum compacted layer thickness of RAP is 6". The maximum compacted soil layer thickness is

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also 6". Successful completion of a test section of 300'-400' long should demonstrate the feasibility of this construction method and should demonstrate that the density can be achieved. Compaction requirements of both soils and RAP shall meet specifications 120-9.

**B) Subgrade Construction**

RAP material is only permitted in paved shoulders, bike paths or other non-traffic applications as stabilizer in the subgrade (Section 914-3.2) in provided a minimum LBR of 40 and the required density can be achieved. Other tests (except the organic content test) for suspected toxic substances may be required (Section 914-4).

All test results of the proposed stabilizing material shall be submitted to the District Materials Engineer for approval at least 14 days prior to the commencement of the field stabilizing operation. The DME may request samples of the stabilizing material and subgrade soil for verification tests.

**C) Base Construction**

RAP material is only permitted in paved shoulders, bike paths or other non-traffic applications (Section 283). No RAP material or mixtures of RAP and limerock base material are allowed in the construction of pavement base subjected to traffic.

**D) MSE Wall Backfill**

RAP material is presently not permissible for use as MSE wall backfill because of the possibility of creep of the straps under sustained horizontal stresses. Research needs to be performed on creep and pull-out tests before its use can be considered.

If you have further questions, please contact Sastry Putcha at 850-414-4148 (suncom 994-4148).

PM/pw