

Zack Stewart  
Northern District Commissioner

Wayne O. Burkes  
Central District Commissioner

Ronnie Shows  
Southern District Commissioner



S.P.  
Kenneth I. Warren  
Executive Director

James H. Kopf  
Deputy Executive Director/  
Chief Engineer

Mississippi Department of Transportation / P.O. Box 1850 / Jackson, Mississippi 39215-1850 / Telephone (601) 359-7001 / FAX (601) 359-7110

April 14, 1998

## MEMORANDUM

**TO: District Engineers**

**FROM: Roadway Design Division Engineer**  
John B. Pickering *J. B. P.*

**RE: Recommendations Regarding Earthwork on Proposed Projects**

Historically, earthwork recommendations (undercut limits, borrow material selection, etc.) have been made by the District Materials Engineer, and have been included in the pavement recommendation. Since the pavement recommendation often arrives in Roadway Design after right-of-way (ROW) is purchased, changes to ROW required by an earthwork recommendation are often impossible.

In an effort to correct this problem, the following procedure will be followed on all future projects:

### ALL Projects Which Include Grading (Including Bridge Projects):

A recommendation regarding the proposed earthwork should be submitted prior to the time that ROW plans are finalized. Roadway Design Division (Keith Purvis) will be responsible for requesting this information at the appropriate time. This information will be requested with the attached form (Earthwork Design Request Form).



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The earthwork recommendation should specify the design CBR and detail any special instructions (such as undercutting, or requiring a certain class borrow in the design soil) necessary to achieve it. This plan should identify any high-volume change soil (>60%), and propose one of the three methods included in S.O.P. # T.M.D. 20-14-00-000 for treating it. Furthermore, if the removal of high volume change material is required, a recommendation should be made on whether to utilize this material in embankments in accordance with the high volume change S.O.P. Please note that if high-volume change material is to be used in fill sections, then 5:1 fill slopes must be specified, and a select borrow (classes listed in SOP) must be placed over that material. Any such areas, in which it is proposed to place high-volume change material within the roadway embankment, shall be included in the District's recommendation. A secondary option for the disposal of undercut material is to place the high volume change material in a core. The required details for this method are shown in the attached April 13, 1998 memorandum.

When the development of plans is to the point where a pavement recommendation is needed, Roadway Design Division (Keith Purvis) will request it. That request will be made with the attached form (Pavement Design Request Form).

**From this date forward, ROW plans will not be finalized until an earthwork recommendation is submitted to, and implemented by Roadway Design Division.**

Attachment

pc: Asst. Chief Engineer-Operations (McMahon)  
Asst. Chief Engineer-Preconstruction (Ruff)  
District Construction Engineers  
District Materials Engineers  
Construction Division (Russell, Crisco)  
Roadway Design (Pickering, Balentine, Purvis, Reeves, Section Engineers)  
Central Files

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TO: \_\_\_\_\_ (District Materials Engineer)      DATE: \_\_\_\_\_

FROM: Keith Purvis (83-01, Roadway Design Division)

COPY TO: District Engineer ( \_\_\_\_\_ ), Roadway Design Section Engineer ( \_\_\_\_\_ )

**EARTHWORK DESIGN REQUEST FORM**

Revised: 04/14/98

An earthwork recommendation for the following project is hereby requested.

This recommendation should specify the **design CBR** and detail any special instructions (such as undercutting, or requiring a certain class borrow in the design soil) necessary to achieve it. This plan should **identify high-volume change soil (>60%)** in the design soil prism, and propose one of the three methods included in S.O.P. # T.M.D. 20-14-00-000 for treating it. **Furthermore, if the removal of high volume change material is required, a recommendation should be made on whether to: A) utilize this material in embankments (in accordance with the high volume change S.O.P); or B) waste the material.** Please note that if high-volume change material is to be used in fill sections, then 5:1 fill slopes must be required, and a select borrow (classes listed in SOP) must be placed over that material. The earthwork recommendation should **specify such disposal areas**. A secondary option for the disposal of undercut material is to place the high volume change material in a core. The details for this method are documented in a memorandum dated April 13, 1998.

It is also requested that you provide a copy of the original soil profile with this recommendation.

**Right-of-way plans will not be finalized until this recommendation is submitted to, and implemented by Roadway Design Division.**

A current set of plan profile sheets is enclosed.

Remarks: \_\_\_\_\_

**PROJECT INFORMATION:**

PE #: \_\_\_\_\_

English

Metric

Const#: \_\_\_\_\_

County: \_\_\_\_\_

Design Squad: \_\_\_\_\_

Route: \_\_\_\_\_

Proposed ROW Printing Date: \_\_\_\_\_

Termini: \_\_\_\_\_

Proposed Letting Date: \_\_\_\_\_

**TYPE PROJECT:**

New Lanes (Grade & Pave)

Reconstruction

4R/3R Rehabilitation

New Lanes (Pave Only)

Bridge Replacement

Slide Repair

Realignment

Intersection Improvement

Widen & Overlay

Other : \_\_\_\_\_

## PAVEMENT DESIGN REQUEST FORM

Revised 03/23/98

Roadway Design Division hereby requests a pavement recommendation for the project shown below.  
**PLEASE NOTE THE "INFORMATION NEEDED" SECTION.**

TO: \_\_\_\_\_ (District Materials Engineer)                      DATE: \_\_\_\_\_

FROM: Keith Purvis (83-01, Roadway Design Division)

COPY TO: District Engineer ( \_\_\_\_\_ ), Roadway Design Section Engineer ( \_\_\_\_\_ )

### PROJECT INFORMATION:

PE #: \_\_\_\_\_                       English                       Metric  
Const#: \_\_\_\_\_                      County: \_\_\_\_\_  
Route: \_\_\_\_\_                      Design Squad: \_\_\_\_\_  
Termini: \_\_\_\_\_                      Proposed Letting Date: \_\_\_\_\_

### TYPE PROJECT:

- |   |   |   |
|---|---|---|
| <input type="checkbox"/> New Lanes (Grade & Pave) | <input type="checkbox"/> Reconstruction           | <input type="checkbox"/> 4R/3R Rehabilitation |
| <input type="checkbox"/> New Lanes (Pave Only)    | <input type="checkbox"/> Bridge Replacement       | <input type="checkbox"/> Slide Repair         |
| <input type="checkbox"/> Realignment              | <input type="checkbox"/> Intersection Improvement | <input type="checkbox"/> Widen & Overlay      |
| <input type="checkbox"/> Other : _____            |   |   |

### ATTACHMENTS :

- |   |  |
|---|--|
| <input type="checkbox"/> Layout/Plan-Profiles | <input type="checkbox"/> Design Traffic Data |
| <input type="checkbox"/> Other : _____        |  |

### INFORMATION REQUESTED :

- |   |  |
|---|--|
| <input type="checkbox"/> Flexible Pavement Design (ST, HT, OR POLYMER)    | <input type="checkbox"/> Rigid Pavement Design   |
| <input type="checkbox"/> Rehabilitation Strategy                          | <input type="checkbox"/> Core Analysis <input type="checkbox"/> Shoulder Design                  |
| <input type="checkbox"/> Temporary\Detour                                 | <input type="checkbox"/> F.W.D. Analysis <input type="checkbox"/> Chemical Treatment of Subgrade |
| <input type="checkbox"/> Pavement Design (Crossing Routes) SPECIFY: _____ |  |
| <input type="checkbox"/> Other : _____                                    |  |

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April 13, 1998

TO: District Construction Engineers

FROM: Roadway Design Division  
Keith Purvis *KCP*

RE: The Placement of High Volume Change Soil in a Core

In accordance with the Department's High Volume Change S.O.P. (#TMD-20-14-00-000), it is common for construction projects to include the removal and replacement of high volume change material located within the proposed design soil prism. It is our understanding that if the undercut material (high volume change) is used within embankment sections, fill slopes shall be no steeper than 1V:5H, and a select material (minimum PI of 6) shall be placed within the design soil prism of the fill sections. In many cases, these two requirements make the disposal of the undercut material a more viable option. Recently, it has been proposed that the high volume change material be placed in the core of embankment sections as shown on the attached drawing.

This method has been determined to be a feasible solution, provided the following conditions are met:

- The volume change of the core material does not exceed 80 percent;
- The final embankment height does not exceed 12 meters (40 feet);
- The core is constructed in accordance with the enclosed drawing;
- Benching of the high volume change core is required if fill heights exceed 6 meters (20 feet). The slope should be benched so that vertical face is limited to 1 meter (3 feet);
- The core and the buffer material outside the core are placed at approximately the same time. The placement of these two materials in separate operations will create a failure plane along the surface of the high volume change core.



**ADDITIONAL INFORMATION REGARDING THIS METHOD**

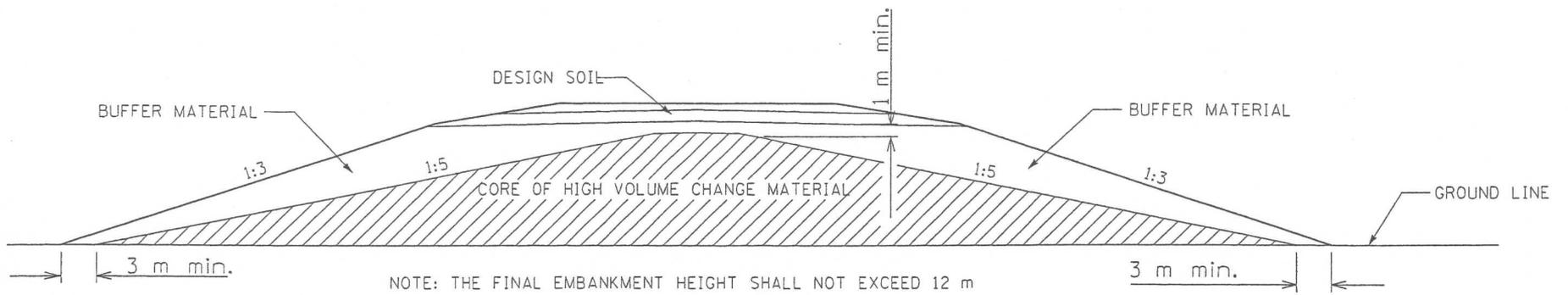
- No moisture barrier will be required below the high volume change core;
- The use of this method will not necessitate any special requirements to be placed on the buffer material or the design soil. The buffer material and the design soil **may** consist of the available unclassified excavation which has a volume change of less than 60 percent (additional conditions on the design soil prism are allowed, but not required). The pavement design will be based on the minimum expected CBR of the design soil;

This method would allow for the use of the high volume change material within the embankment, but could lead to other construction related problems. For these reasons, this concept should be carefully considered before it is recommended. If this method is to be implemented on a particular project, it should be recommended prior to the time right-of-way plans are finalized. That decision will be reviewed by the following people: 1) District Construction Engineer; 2) District Materials Engineer; 3) Construction Division Area Engineer; 4) Roadway Design Division Section Engineer; and 5) Federal Highway Administration (if applicable).

It should be emphasized that this method is only one option, and should not be recommended unless it is believed that it's use will result in reducing the cost of the project. It should be understood that, based on possible complications during design and construction, and the long-term performance, that the preferred method would be to waste the high volume material off the project right-of-way.

Attachment

pc: Asst. Chief Engineer-Operations (McMahan)  
Asst. Chief Engineer-Preconstruction (Ruff)  
Materials Division (Brumfield)  
Geotechnical Branch (Davis)  
Construction Division (Russell, Crisco)  
Research Division (Crawley)  
Roadway Design (Pickering, Balentine, Reeves, Purvis, Section Engineers)  
Central Files



TYPICAL SECTION, HIGH VOLUME CHANGE CORE

NTS