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April 13, 1998

TO: District Construction Engineers

FROM: Roadway Design Division
Keith Purvis *CKP*

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

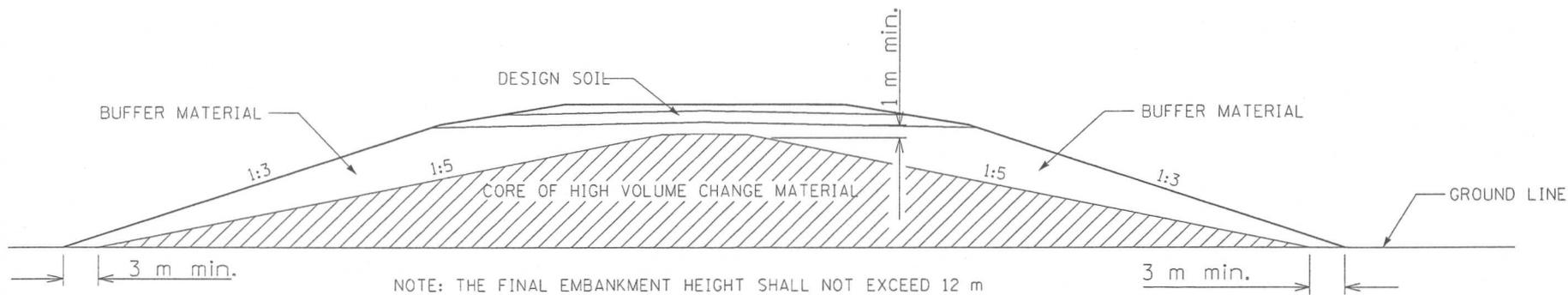
- No moisture barrier will be required below the high volume change core;
- The use of this method will not necessitate any special requirements to be placed on the buffer material or the design soil. The buffer material and the design soil **may** consist of the available unclassified excavation which 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 (McMahon)
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

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