Design Standards Letter

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Section/Plan No.: None

Subject: Pavement Edge Drains

Body

We have received several inquiries concerning the use of the geocomposite edge drain. This letter is to explain procedures currently used in making decisions about use of retrofit pavement edge drawings on rehabilitation projects for interstates and some primary routes.

Conditions surveys are performed by main office Materials and Research crews wherein pavement cores are cut and removed, base samples are retrieved, and thin-walled tube samples of the subgrade are recovered. Gradation tests are performed on the base. Moisture content, minus No. 200 content, and both ASTM and AASHTO classifications are determined from the subgrade soil samples. These data are used to evaluate relative permeabilities of base and subgrade and the probable success of edge drains.

Criteria for edge drain use were developed from surveys of the literature and of other states' experiences. These criteria include the following:

1. Fines (minus No. 200) content of the base not in excess of 25 percent. (This indicates a base that is virtually impermeable. The literature indicates that edge drains will not only be ineffective but may do more harm than good at values in excess of 25 percent.)

2. A subgrade must be more impermeable than the base. (This is indicated by comparing minus No. 200 contents and evaluating subgrade moisture content and soil classification data. Obviously, a free-draining subgrade would not require a supplemental drainage system.)

3. Evidence of moisture-related damage from observations made during the condition survey. (These include pumping, D-craking, etc.)

4. Edge drains should not be used alone (i.e., without rehabilitation)

except on pavements still in relatively good condition.

5. Edge drains should be used with caution with rocky subgrades due to possible loss of edge support from ragged trench cuts.

6. Recommended maximum drainage distance to outlet laterals or separation distances between laterals should be provided in the plans in accordance with Table 1 below. In addition, a drain outlet must be provided at a vertical sag. Obviously, none is needed at a vertical crest from which point the maximum drainage distance to an outlet is calculated. Laterals must also be provided where physical obstacles interrupt the continuity of the edge drain.

TABLE 1
MAXIMUM ALLOWABLE DRAINAGE DISTANCE TO OUTLET OF SEPARATION DISTANCE BETWEEN OUTLETS

Gradient %	Distance or Spacing
< or = to 1	250 ft.
1 < or = to 2	375 ft.
> 2	500 ft.

Desirable lateral gradients are a minimum 2 percent with lateral outlets flow line, a minimum of 6 inches above ditch flow line. In some cases, this may require a special ditch section in order to maintain drainage.

A standard special provision, MRSP-90-7, should be used to control the work. The tables for drain outlet spacing, now in the standard special provision, will be removed in the next revision as all presently approved geocomposite drain products meet the 15 gal./min./ft. flow requirement.

We would appreciate comments on your opinion of the preformace of edge drains in your district.

dd/pr