



October 1, 2004

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FROM: Don Nelson 
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SUBJECT: **Project Delivery Memo #04-07** – Geogrid Brittleness

Purpose and Direction

Background: On a recent major project we discovered deficiencies in the Tensar geogrid products that could potentially affect performance of the mechanically stabilized earth (MSE) walls. This geogrid is a major structural component of various types of MSE walls and is not adequately addressed by the current specifications. These deficiencies relate to the straightness of the cross-ribs that connect to the wall facing elements and the potential brittleness in the product that could result in cracking or failure of these cross-ribs.

The straightness of the cross-ribs affects the ability of the wall facing/soil reinforcement connection tabs to be uniformly engaged such that there are no stress concentrations in the reinforcement. This issue, combined with potential brittleness, could result in premature failure of the facing/soil reinforcement connection, resulting in wall distress. The manufacturer of the product has made a strong commitment to fully address this problem. Based on this commitment, and considering their long and successful history in the MSE wall and geosynthetics industries, the best course of action is to implement specification changes that will enable us to protect WSDOT's infrastructure investment without eliminating this product.

These specification changes will address both of these issues and assure us an acceptable product. We intend to permanently implement these specifications to make sure that these problems do not surface again with either the Tensar products or other similar products that are or could possibly be added to our Qualified Products List.

Types of Projects Affected: This change applies to all projects with temporary or permanent geosynthetic retaining walls. It also affects geogrid reinforced structural earth walls that are faced with concrete block or pre-cast concrete panels.

Direction: It is the intent of WSDOT to continue to utilize this type of technology for retaining wall design and construction. This change incorporates revised specifications that focus on performance of the materials used.

Value in Making the Change: Immediate distribution and implementation of this change will enhance the quality and integrity of structural earth and geosynthetic retaining walls on projects that are affected.

Action Requested

Project Development

The General Special Provisions have been revised and are available electronically. GSP 1402101.FB6 or 1402102.FB6 shall be used for all projects with permanent or temporary geosynthetic retaining walls respectively. GSP 130202.GB6, 130203.GB6, 130202.MB6, or 130203.MB6 shall be used on all projects with geogrid reinforced structural earth walls that are faced with concrete block or pre-cast concrete panels.

Contract Ad and Award

For projects meeting these criteria that are currently being advertised for bids, the appropriate provisions should be added by addendum if it is possible to do so without impacting the bid opening. Addenda that will delay the bid openings should also be considered on a case-by-case basis.

Construction

Construction personnel should be aware of this problem and consult with the Headquarters Materials Lab if this product is being used on site. Simple tests can be performed on site to see if the product is acceptable. Based on the manufacturer's commitment to correct this problem, we would expect that replacement material would be supplied or the design would be revised to provide an adequate wall design.

DN:dlm
KJD/HJP

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