ADOT Vendor	Tensar International Corporation, 5883 Glenridge Dr, #200, Atlanta, GA 30328	
General Information	ADOT Pride #: 09112 Approval Date: 12/15/2009 Re-evaluaton due: 8/31/2020	
Design Standards	<ol> <li>More stringent of the following:</li> <li>2008 ADOT Standard Specifications for Road and Bridge Construction.</li> <li>Latest ADOT MSE Wall LRFD Based Special Provisions. [Contact ADOT for latest version at the time of the application of the system to a given project.]</li> <li>FHWA (2009), "Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes; Publication No. FHWA-NHI-09-083; Authors: Berg, R. R., Christopher, B. R., and Samtani, N. C.</li> <li>AASHTO (2007 with Latest Interims) LRFD Bridge Design Specifications.</li> </ol>	
HITEC Evaluation	Highway Innovative Technology Evaluation Center (HITEC) evaluation was completed in 2000. Civil Engineering Research Foundation (CERF) Report No. 40358. Report available on file.	
Blocks Evaluated	• MESA Blocks (see Figure 1)	
Geogrid Connector	• 19 teeth per 21 openings "DOT" connector which relies on positive mechanical interlock. See Figures 2 to 4.	
Geogrids Evaluated	• Tensar "UX" Series: UX1100MSE, UX1400MSE, UX1500MSE, UX1600MSE, UX1700MSE	
Block Geogrid Connection Strength	• See Table 1	
Notes/Constraints	<ul> <li>In addition to the general design requirements provided in the Design Standards listed above, the following specific requirements apply:</li> <li>For any project, use of the system evaluated herein is subject to ADOT approval based on project- and site-specific evaluation.</li> <li>Only the system components evaluated as noted above are to be used. Details in the HITEC report are considered to be superseded by the figures, tables and typical details in this evaluation. Tolerances shall be the more stringent of those noted in Tensar's attached drawings and the Design Standards listed above.</li> <li>The longitudinal and transverse ribs of the geogrid shall be perpendicular to one another. The maximum deviation of the cross-rib (bow) from being perpendicular to the longitudinal rib, i.e., skew, shall be manufactured to be no more than 1 inch in 5 feet of geogrid width. The maximum deviation of the cross-rib at any point from a line perpendicular to the longitudinal ribs located at the cross-rib (bow) shall be 0.5 inches.</li> <li>The gap between the connector tabs and the bearing surface of the geogrid reinforcement cross-rib shall not exceed 0.5 inches. Gaps in the remaining connector tabs shall not exceed 0.3 inches.</li> </ul>	

	<ul> <li>The long-term nominal connection strength, T<sub>alc</sub>, in Tables 1 shall be multiplied by the resistance factor for connection strength as specified in the latest AASHTO specification (Design Standard 4 listed above) to obtain the long-term factored connection strength.</li> <li>Reinforcement pullout shall be calculated based on the default values for geogrids provided in the latest AASHTO specification (Design Standard 4 listed above).</li> <li>Soil reinforcement length shall be measured from back of the facing block.</li> <li>Block core infill is not required for structural or connection strength as the connection strength in Table 1 was developed with a voided core. However, erection with a voided core requires greater care by the erection contractor as the facing blocks are more prone to horizontal movement during construction. Core fill, if used, should be free-draining and in accordance with the requirements listed in the latest AODT MSE Wall LRFD based Special Provisions (Design Standard 2 listed above).</li> <li>All details for penetration of culverts or other objects through the wall face shall be evaluated on a project- and site-specific basis.</li> <li>All details for penetration of vertical and horizontal obstructions through the reinforced soil zone shall be evaluated on a project- and site-specific basis, slotted drains, etc.</li> <li>Drainage details shall be modified as appropriate to meet project- and site-specific requirements.</li> </ul>
Assumptions	<ul> <li>Vendor submittals shall be in accordance with the design standards and other requirements listed herein.</li> <li>ADOT and its design representatives will evaluate the project- and site-specific application of Tensar's MESA system and review submittals for approval consideration in strict accordance with the design standards, limitations, and requirements listed herein. Typical details in this package may not be applicable to a given project and will be modified, based on site-specific considerations, as necessary by the designer in consultation with the vendor.</li> <li>During construction of the Tensar's MESA system, ADOT and it's representatives will enforce project- and site-specific acceptance requirements in accordance with the plans and specifications.</li> </ul>



Figure 1: (a) MESA Standard unit, (b) MESA straight-sided cap unit, (c) Standard MESA radius unit, (d) MESA angle sided cap unit.





Figure 3: MESA standard unit and geogrid connection detail with DOT connector system.



#### Figure 4: MESA geogrid connection and orientation.

Table 1
Long-Term Nominal Connection Strength Requirements for
Tensar "UX" Series Geogrid Reinforcements with DOT connector

Geogrid	Long-term Nominal Connection Strength, T <sub>alc</sub>
UX1100MSE	1,179 lb/ft
UX1400MSE	1,426 lb/ft
UX1500MSE	2,320 lb/ft
UX1600MSE	2,932 lb/ft
UX1700MSE	3,354 lb/ft

# **TYPICAL DETAILS**

#### (7 pages)

Typical details submitted to ADOT as part of the product approval process are attached. These represent generic details that must be evaluated by the designer based on project- and site-specific requirements. The designer shall also be responsible for ensuring conformance to the details in Figures 1 to 4 as well as the constraints and design standards noted in this evaluation.



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