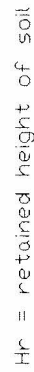


- ASSUMPTIONS:
- ALL WALLS, FRC TRAINING, THEREFORE NO WATERLOGGING
 - REDUCTION FACTOR FOR W1500 GEGRID ASSUME GEGRID BACKFILL CONTAINS GRAVELLY SANDY SOILS
 - ASSUME FILL AND NATIVE SOILS UNIT WEIGHT OF 120 PCF
 - INTERIOR ANGLE OF 34 DEGREES AND ZERO CURVATURE
 - ASSUME SURCHARGE OF 250 PSF ON TOP OF THE WALL
 - ASSUME $u_n = 0.5$ PGA FOR SEISMIC DESIGN

[illegible]



- [illegible]

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GUIDE SPECIFICATION FOR GEOSYNTHETIC REINFORCEMENT MATERIALS		6.0 Sampling and Testing, Acceptance		7.3 Fill Placement	
Where geosynthetic reinforcements are used for the construction of MSE walls with modular block facings (MBW) or segmental precast concrete units, the primary specification under Materials, Soil Reinforcement and Attachment Devices shall be as follows:		Sampling and conformance testing shall be in accordance with ASTM D4354. Conformance testing procedures shall be established under 5.0. Geosynthetic product acceptance shall be based on ASTM D 4759.		Geosynthetic reinforcement shall be placed directly on the compacted horizontal fill surface. Geosynthetic reinforcements are to be placed within 75 mm of the design elevations and extend the length as shown on the elevation view or sections unless otherwise directed by the owners' engineer. Correct orientation of the geosynthetic reinforcement shall be verified by the contractor.	
1.0 Geotextiles and Thread for Sewing		The quality control certificate shall include:		- Fill shall be compacted as specified by project specifications or to at least 95 percent of Modified Proctor maximum dry density. - Density testing shall be completed by Davies Geotechnical Inc. at regular intervals during the construction process. - Backfill shall be placed, spread, and compacted in such a manner to minimize the development of wrinkles and/or displacement of the geosynthetic reinforcement. - Fill shall be placed in 300mm maximum lift thickness where heavy compaction equipment is used and 150mm maximum uncompacted lift thickness where hand operated equipment is used. - Backfill shall be graded away from the slope crest and rolled at the end of the day to prevent ponding of water on the surface of the reinforced soil mass. - Tracked excavation equipment shall not be operated directly upon the geosynthetic reinforcement. A minimum fill thickness of 150 mm is required prior to operation of tracked vehicles over the geosynthetic reinforcement. Turning tracked vehicles should be kept to a minimum to prevent tracks from displacing the fill and the geosynthetic reinforcement. - If approved by the engineer rubber tired equipment may pass of the geosynthetic reinforcement at speeds of less than 16 km/hr. Sudden braking and sharp turning shall be avoided. - In the event that density testing indicates that a lift of backfill has failed to meet the project specification, the lift shall be re-compacted and retested until the specification is met or the lift shall be removed and replaced with suitable fill compacted to the minimum specified level.	
2.0 Geogrids		- roll numbers and identification - sampling procedures - result of quality control tests, including a description of test methods used.			
3.0 Required Properties		7.0 Granular Backfill			
The geogrid shall be a regular network of integrally connected polymer tensile elements with aperture geometry sufficient to permit significant mechanical interlock with the surrounding soil or rock. The geogrid structure shall be dimensionally stable and able to retain its geometry under manufacture, transport, and installation.		The backfill shall consist of well graded sand or sand and gravel with less than 5% passing the # 200 sieve. The maximum size of backfill shall be 20mm, unless full scale installation damage tests are conducted in accordance with ASTM D5818.			
4.0 Certification		7.1 Site Excavation			
The contractor shall submit a manufacturer's certification for each type of geogrid employed on the project.		All areas immediately beneath the installation damage area for the geosynthetic reinforcement shall be properly prepared as detailed on the plans and sections, specified elsewhere within the specifications, or directed by the engineer. Subgrade surface shall be level, free from deleterious materials, loose or otherwise unsuitable soils. Prior to placement of geosynthetic reinforcement, subgrade shall be proof rolled to provide a uniform and firm surface. Any soil areas, as determined by the owner's engineer, shall be excavated and replaced with suitable compacted soils. The foundation surface shall be inspected and approved by the owners geotechnical engineer prior to fill placement. Benching the backcut to competent soil shall be performed as shown on the plans or as directed, in a manner that ensures stability.			
The manufacturer's certificate shall state that the furnished geosynthetic meets the requirements of the specifications as evaluated by the manufacturer's quality control program. The certificates shall be attested to by a person having legal authority to bond the manufacturer. In case of dispute over the validity of values, the engineer shall require the contractor to supply test data from and agency approved laboratory to support the certificate values submitted, at the contractor's cost.		7.2 Geosynthetic Placement			
5.0 Manufacturing Quality Control		The geosynthetic reinforcement shall be installed in accordance with The manufacturer's recommendations, unless otherwise modified by these specifications. The geosynthetic reinforcement shall be placed within the layers of the compacted soil as shown on the plans or as directed.			
The geosynthetic reinforcement shall be manufactured with a high degree of quality control. The manufacturer is responsible for establishing and maintaining a quality control program to ensure compliance with the requirements of the specification. The purpose of the QC testing program is to verify that the reinforcement geosynthetic being supplied to the project is representative of the material used for performance testing and approval by the agency.		- The geosynthetic reinforcement shall be placed in continuous longitudinal strips in the direction of main reinforcement. Joints in the design strength direction (perpendicular to the slope or wall) shall not be permitted with the geotextile or geogrid, except as indicated on the drawings. - Horizontal coverage of less than 100 percent shall not be allowed unless specifically detailed in the construction drawings. In the case of 100 percent coverage in plan view adjacent strips need not be overlapped. - Adjacent rolls of geosynthetic reinforcement shall be overlapped or mechanically connected where exposed in a wrap around face system, as applicable. - Placed only the amount of geosynthetic reinforcement require for immediately pending work to prevent undue damage. After a layer of geosynthetic reinforcement has been placed, the next succeeding layer of soil shall be placed and compacted as appropriate. After the specified soil layer has been placed, the next geosynthetic reinforcement layer shall be installed. The process shall be repeated for each subsequent layer of geosynthetic reinforcement and soil. - Geosynthetic reinforcement shall be placed to lay flat and pulled tight prior to backfilling. After a layer of geosynthetic reinforcement has been placed, suitable means such as pins or small piles shall be used to hold the geosynthetic reinforcement in position until the subsequent soil layer can be placed. Under no circumstances shall a track type vehicle be allowed on the geosynthetic reinforcement before at least 150mm of soil has been placed. Sudden braking and sharp turning - sufficient to displace fill shall be avoided.			
Conformance testing shall be performed as part of the manufacturing process and may vary for each type of product. As a minimum the following index tests shall be considered as applicable for an acceptable QA/QC program:		- Property - Specific Gravity (HDPE only) - Ultimate tensile strength - Melt flow (HDPE and PP only) - Intrinsic viscosity (PET only) - Carboxyl end group (PET only)			
Test Procedure		- ASTM D1505 - ASTM D4595; GRI: GG1 - ASTM D 1238 - ASTM D 4603 - ASTM D 2455			
5			OWN B7:	DATE:	
4			ALJ	FEB 06, 2018	
3	FEB 2018	ISSUED FOR REVIEW	OWN B7:	PROJECT NO:	P129
2	DEC 2017	ISSUED FOR REVIEW	APP:	REV NO:	REV.3
1	NOV 2017	ISSUED FOR REVIEW	SCALE	OWN No.	G006
REV.	DATE	REVISION			
			Davies Geotechnical Inc.		
			#2 - 1520 Cliveden Avenue, Delta, B.C. V3M 6J8		
			Tel 604-395-2300		
			TONY YIU		
			NOTES 2/2		
			RETAINING WALL REPLACEMENT		
			398 NORTH HYTHE AVE, BURNABY, BC		