TensarTech® ARES™ Earth Retaining Wall System: Model Specification and Bill of Quantities

Model specification clause:

The work shall consist of the design and construction of retaining walls using a proprietary concrete incremental panel faced, reinforced earth wall system, constructed in accordance with the supplier's drawings and specifications and in conformity with the alignment, grades and dimensions shown on the contract documents or as established by the Engineer. The contractor shall provide a complete set of drawings issued for construction and complete specifications of the proposed wall system for the approval of the Engineer 60 days prior to ordering materials to construct the walls,

The proposed system must demonstrate previous experience for similar reinforced soil walls with a minimum in service life of 20 years. The wall system as a whole shall have a current British Board of Agrément (BBA-HAPAS) certificate for Roads and Bridges, demonstrating suitability for use in highways walls and bridge abutments with a minimum 120-year design life.

The design, materials specification and construction methods adopted shall be in accordance with BS 8006-1 : 2010 + A1 : 2016 *Code of practice for strengthened/reinforced soils and other fills*, (DMRB 2.1.5) and Manual of Contract Documents for Highway Works (MCHW), Volume 1 Specification for Highway Works (MCHW1) March 1998 Edition or BS8006 Code of Practice for Strengthened/Reinforced soils and other fills, whichever is appropriate. The design must be performed by the supplier of the wall system, who shall submit proof of professional indemnity insurance. The specifications as presented to the Engineer shall state any requirements for, or limitations on the backfill used in the structure to ensure the design life. The tender submission shall be accompanied by:

- A copy of the current BBA HAPAS certificate
- Sample design calculations for the proposed walls in compliance with the appropriate design standard
- Specification proposals and parameters for the reinforced soil fill and backfill
- Method statement for construction
- Confirmation of the Professional Indemnity and Product Liability insurance cover provided by the Wall System Supplier

The wall system will comprise principally of 1.5m x 1.5m x 0.14m concrete panel facing units with cast in geogrid starter tabs connected with high density polyethylene polymer bodkins to uniaxially orientated high density polyethylene geogrids. The allowable connection strength at the face (T_{conn}) to be used in the design shall have been tested and independently assessed for each grade of geogrid reinforcement used in the design and published in the relevant BBA HAPAS Roads and Bridges certificate. The long-term strength (Ultimate Limit State) shall be for a design life of 120 years at a mean temperature of 10°C. This shall be determined by application of standard extrapolation techniques to creep data obtained in accordance with BS EN ISO 13431:1999 and shall be a lower bound value. Values shall be based on a minimum 100,000 hour of continuous creep testing.

The Contractor shall construct the wall system in full compliance with the method described by the system supplier and to the line and level shown on the contract drawing

The contractor is responsible for ensuring that construction adjacent to the wall by others does not disturb the wall system or place temporary construction loads on the wall that exceed design loads, including loads such as water pressure, temporary grades, or equipment loading.

Bill of Quantities section of the contract documents:

The following information is intended as a guideline for designers and specifiers when wanting to include a Tensar*Tech* ARES earth retaining structure in their contract documents.

Item No	Description	Quantity	Unit	Rate	Total
1.1	**TensarTech ARES Incremental Panel Reinforced Earth Retaining Wall System** Design Supply and Install reinforced soil structures in accordance with specification clause……. Measured elevated face of structure from top of footing to top of wall Item coverage to include: Detailed design calculations Provision of all drawings for construction Design certificate from approved supplier. Installation of facing panels including propping of the first panels, all to line and level as per construction drawings. HDPE Geogrid reinforcement – cut to lengths shown on drawings and laid. Connection to face panel geogrid tabs of the geogrid using polymer bodkins and tensioning of geogrid prior to placing fill material - Item 1.5 Wall height 0m to 5m Wall height 5m to 7m Wall height 7m to 11m Wall height 11m to 14m Wall height 14m to 18m		 m^2 m^2 m^2 m^2 m^2		
1.2	Insitu 30/20 concrete strip footing in accordance with the specification		lin.m		
1.3	Supply and Installation of precast concrete coping unit to top of wall face		lin.m		
1.4	Provision and installation of drainage layer in accordance with drawings and specification		m^3		
1.5	Supply, place and compact approved structural fill to reinforced soil structure in accordance with drawings and specification.		m^3		

Contact Tensar International if more specific advice is required

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