


# Schedule of Accreditation

issued by

## United Kingdom Accreditation Service

21 - 47 High Street, Feltham, Middlesex, TW13 4UN, UK

|                                                                                                                                |                                                                     |                                                                                                             |
|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
|  <p>Accredited to<br/>ISO/IEC 17025: 2005</p> | <h3>Geospec Ltd</h3>                                                |                                                                                                             |
|                                                                                                                                | <p><b>Issue No:</b> 017    <b>Issue date:</b> 22 September 2011</p> | <p><b>Unit A3</b><br/>Healey House Estate<br/>Netherton<br/>Huddersfield<br/>West Yorkshire<br/>HD4 7DG</p> |
| <p><b>Testing performed at the above address only</b></p>                                                                      |                                                                     |                                                                                                             |

### DETAIL OF ACCREDITATION

| Materials/Products tested                   | Type of test/Properties measured/Range of measurement            | Standard specifications/ Equipment/Techniques used                         |
|---------------------------------------------|------------------------------------------------------------------|----------------------------------------------------------------------------|
| GEOTEXTILES and Geotextile related products | Thickness (t>1mm) at specified pressures (excluding 200 kPa)     | BS EN ISO 9863-1:2005<br>ASTM D5199-01(06)<br>BS EN 964-1:1995 (withdrawn) |
|                                             | Compressive properties (forces from 0.20 kN to 50 kN)            | ASTM D1621-04a                                                             |
|                                             | Compressive properties (forces from 0.20 kN to 50 kN)            | Documented In-House Method<br>SS 008                                       |
|                                             | Grab breaking load and elongation (forces from 0.10 kN to 50 kN) | ASTM D4632-08<br>ASTM D4632-91(03) (superseded)                            |
|                                             | Static puncture test (CBR test) (forces from 0.20 kN to 50 kN)   | BS EN ISO 12236:2006<br>BS EN ISO 12236:1996 (withdrawn)                   |
|                                             | Index puncture resistance                                        | ASTM D4833-07                                                              |
|                                             | Trapezoid tearing strength (forces from 0.1 kN to 50 kN)         | ASTM D4533-04<br>ASTM D4533-91(1996)(superseded)                           |
|                                             | Wide-width tensile (forces from 0.1 kN to 50 kN)                 | BS EN ISO 10319:2008<br>BS EN ISO 10319:1996 (withdrawn)                   |
|                                             | General tests for evaluation following durability testing        | BS EN 12226 :2000                                                          |
|                                             | Mass per unit area                                               | BS EN ISO 9864:2005<br>BS EN 965 :1995 (withdrawn)                         |
| Determination of resistance to weathering   | BS EN 12224:2000                                                 |                                                                            |
| Determination of In-plane water flow        | BS 6906:Part 7:1990(1995) (withdrawn)                            |                                                                            |



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| GEOTEXTILES and Geotextile related products (continued)                              | Dynamic perforation test (cone drop test)                                                                | BS EN 918 :1996 (withdrawn)<br>BS EN ISO 13433 :2006                                                              |
|                                                                                      | Resistance to oxidation (Screening test method)                                                          | BS EN ISO 13438:2004                                                                                              |
|                                                                                      | Compressive creep properties                                                                             | BS EN ISO 25619-1:2008<br>BS EN 1897:2001 (withdrawn)                                                             |
|                                                                                      | Determination of short-term compression behaviour                                                        | BS EN ISO 25619-2 :2008                                                                                           |
|                                                                                      | Determination of water permeability characteristics normal to the plane of the geotextile, without load. | BS EN ISO 11058 :1999                                                                                             |
|                                                                                      | Determination of water flow normal to the plane of the geotextile under a constant head                  | BS 6906 Part 3 :1989 (withdrawn)                                                                                  |
|                                                                                      | Determination of the characteristic opening size                                                         | BS EN ISO 12956 :1999                                                                                             |
|                                                                                      | Determination of water flow capacity in their plane                                                      | BS EN 12958:2010<br>BS EN ISO 12958:1999 (withdrawn)                                                              |
|                                                                                      | Determination of long term protection efficiency of geotextiles in contact with geosynthetic barriers    | BS EN ISO 13719 :2002                                                                                             |
|                                                                                      | Cylinder testing of protectors for geomembranes on landfill sites                                        | Environment Agency methodology for cylinder testing of protectors for geomembranes on landfill sites – April 2006 |
| Microscopic evaluation of the dispersion of carbon black in polyolefin geosynthetics | ASTM D5596-03                                                                                            |                                                                                                                   |
| Strength of internal structural junctions. Geocomposites                             | BS EN ISO 13426-2:2005                                                                                   |                                                                                                                   |



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| GEOMEMBRANES                                               | Determination of thickness at specified pressures (excluding 200 kPa)                                                      | BS EN ISO 9863-1:2005<br>ASTM D5199-01(06)<br>BS EN 964-1:1995 (withdrawn)                      |
|                                                            | Determining the integrity of nonreinforced geomembrane seams produced using thermo-fusion methods (Peel and shear testing) | ASTM D6392-08                                                                                   |
|                                                            | Determining the integrity of field seams used in joining flexible polymeric sheet geomembrane (Peel and shear testing)     | ASTM D413-98(07) (superseded)<br>ASTM D4437-99<br>ASTM D816-82(01) (superseded)                 |
|                                                            | Static puncture (CBR test) (forces from 0.20 kN to 50 kN)                                                                  | BS EN ISO 12236:2006<br>BS EN ISO 12236:1996 (withdrawn)                                        |
|                                                            | Index puncture resistance                                                                                                  | ASTM D4833-07                                                                                   |
|                                                            | Mass per unit area                                                                                                         | BS EN ISO 9864 :2005<br><br>BS EN 965 :1995 (withdrawn)                                         |
|                                                            | Determination of long term protection efficiency of geotextiles in contact with geosynthetic barriers                      | BS EN ISO 13719 :2002                                                                           |
|                                                            | Cylinder testing of protectors for geomembranes on landfill sites                                                          | Environment Agency methodology for cylinder testing of protectors for geomembranes – April 2006 |
|                                                            | Density of plastics by the density gradient technique                                                                      | ASTM D1505-03                                                                                   |
|                                                            | Tensile properties of plastics                                                                                             | ASTM D638-09                                                                                    |
|                                                            | Determining tensile properties of non-reinforced flexible polypropylene geomembranes                                       | ASTM D6693-04                                                                                   |
|                                                            | Tear resistance (Graves tear) of plastic film and sheeting                                                                 | ASTM D1004-09                                                                                   |
| Determination of the melt mass-flow rate of thermoplastics | ASTM D1238-10<br>BS EN ISO 1133:2005                                                                                       |                                                                                                 |



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| GEOMEMBRANES (continued)                                                                                                                                          | Asperity measurement of textured geomembranes using a depth gauge                                                              | GRI GM 12                                                                       |
| GEOGRIDS                                                                                                                                                          | Determination of thickness at specified pressures                                                                              | BS EN ISO 9863-1:2005<br>ASTM D5199-01(06)<br>BS EN 964-1:1995 (withdrawn)      |
|                                                                                                                                                                   | Determination of mass per unit area                                                                                            | BS EN 9864:2005<br>BS EN 965:1995 (withdrawn)                                   |
|                                                                                                                                                                   | Wide-width tensile test                                                                                                        | BS EN ISO 10319:2008                                                            |
| GEOSYNTHETIC CLAY LINERS (GCL's)                                                                                                                                  | Determination of thickness at specified pressures                                                                              | BS EN ISO 9863-1:2005<br>ASTM D5199-01(06)<br>BS EN 964-1:1995 (withdrawn)      |
|                                                                                                                                                                   | Determination of mass per unit area                                                                                            | BS EN 9864:2005<br>BS EN 965:1995 (withdrawn)                                   |
|                                                                                                                                                                   | Static puncture test (CBR test)                                                                                                | BS EN ISO 12236:2006<br>BS EN ISO 12236:1996 (withdrawn)                        |
|                                                                                                                                                                   | Measurement of index flux through a saturated geosynthetic clay liner specimen using a flexible wall permeameter               | ASTM D5887-09                                                                   |
|                                                                                                                                                                   | Determination of the internal and interface shear resistance by the direct shear method                                        | ASTM D6243-09                                                                   |
| GEOSYNTHETIC – SOIL INTERFACE TESTS<br>(The term geosynthetics includes geotextiles, geomembranes, geocomposites, geogrids, geonets and geosynthetic clay liners) | Determination of sand-geotextile frictional behaviour by direct shear. (Geotextile only)                                       | BS 6906 Part 8 :1991(withdrawn)                                                 |
|                                                                                                                                                                   | Determination of friction characteristics of geosynthetics                                                                     | BS EN ISO 12957-1 :2005                                                         |
|                                                                                                                                                                   | Determination of the coefficient of soil and geosynthetic or geosynthetic and geosynthetic friction by the direct shear method | ASTM D5321-08<br>ASTM D5321-02 (superseded)                                     |
|                                                                                                                                                                   | Determination of soil – geotextile frictional behaviour by direct shear. (Geotextile only)                                     | Documented In-House Method based on BS 6906 Part 8 :1991 Appendix A (withdrawn) |



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| GEOSYNTHETIC – SOIL<br>INTERFACE TESTS<br>(continued)<br><br>SOILS for civil engineering<br>purposes | Determination of geotextile – geotextile frictional behaviour by direct shear.(geotextile only)                            | BS 6906 Part 8 :1991 Method A (withdrawn)          |
|                                                                                                      | Determining the coefficient of soil and geosynthetic or geosynthetic and geosynthetic friction by the direct shear method. | ASTM D5321-08<br>ASTM D5321-02                     |
|                                                                                                      | Moisture content<br>- oven drying method                                                                                   | BS 1377:Part 2:1990                                |
|                                                                                                      | Liquid limit<br>- cone penetrometer                                                                                        | BS 1377:Part 2:1990                                |
|                                                                                                      | Liquid limit<br>- cone penetrometer<br>- one point                                                                         | BS 1377:Part 2:1990                                |
|                                                                                                      | Plastic limit                                                                                                              | BS 1377:Part 2:1990                                |
|                                                                                                      | Plasticity index and liquidity index                                                                                       | BS 1377:Part 2:1990                                |
|                                                                                                      | Density - linear measurement                                                                                               | BS 1377:Part 2:1990                                |
|                                                                                                      | Particle density<br>- small pyknometer method                                                                              | BS 1377:Part 2:1990                                |
|                                                                                                      | Particle density<br>- Gas jar method                                                                                       | BS 1377:Part 2:1990                                |
|                                                                                                      | Particle size distribution<br>- wet sieving                                                                                | BS 1377:Part 2:1990                                |
|                                                                                                      | Particle size distribution<br>- dry sieving                                                                                | BS 1377:Part 2:1990                                |
|                                                                                                      | Particle size distribution<br>- sedimentation<br>- hydrometer method                                                       | BS 1377:Part 2:1990                                |
|                                                                                                      | Dry density/moisture content relationship (2.5 kg rammer)                                                                  | BS 1377:Part 4:1990                                |
|                                                                                                      | Dry density/moisture content relationship (4.5 kg rammer)                                                                  | BS 1377:Part 4:1990                                |



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| SOILS for civil engineering purposes (continued)                                                                                                                  | California Bearing Ratio (CBR)<br><i>(loads from 0 to 50 kN)</i>                                                                                                  | BS 1377:Part 4:1990                                       |
|                                                                                                                                                                   | One-dimensional consolidation properties                                                                                                                          | BS 1377:Part 5:1990                                       |
|                                                                                                                                                                   | Permeability in a triaxial cell                                                                                                                                   | BS 1377:Part 6:1990                                       |
|                                                                                                                                                                   | Accelerated permeability test                                                                                                                                     | Environment Agency R & D<br>Technical Report P1-398/TR/2  |
|                                                                                                                                                                   | Shear strength - large shearbox<br><i>(loads from 0 to 50 kN)</i>                                                                                                 | BS 1377:Part 7:1990                                       |
|                                                                                                                                                                   | Undrained shear strength<br>- triaxial compression without measurement of pore pressure<br><i>(loads from 0 to 50 kN)</i>                                         | BS 1377:Part 7:1990                                       |
|                                                                                                                                                                   | Undrained shear strength<br>- triaxial compression with multistage loading and without measurement of pore pressure<br><i>(loads from 0 to 50 kN)</i>             | BS 1377:Part 7:1990                                       |
|                                                                                                                                                                   | Effective shear strength - consolidated, undrained triaxial compression with measurement of pore pressure<br><i>(loads from 0 to 50 kN)</i>                       | BS 1377:Part 8:1990                                       |
|                                                                                                                                                                   | Determination of effective angle of internal friction and effective cohesion of earthworks materials (using 300 mm shearbox)<br><i>(loads from 5 to 1000 kPa)</i> | Specification for Highway Works, HMSO May 2004 Clause 636 |
| Determination of coefficient of friction and adhesion between fill and reinforcing elements or anchor elements for reinforced soil and anchored earth structures. | Specification for Highway Works, HMSO May 2004 Clause 639                                                                                                         |                                                           |
| END                                                                                                                                                               |                                                                                                                                                                   |                                                           |