


Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

 <p style="text-align: center;">Accredited to ISO/IEC 17025:2005</p>	Sandberg LLP	
	Issue No: 037	Issue date: 12 March 2007
<p>5 Carpenters Place Clapham High Street London SW4 7TD</p>	<p>Contact: Mr P Tate Tel: +44 (0)20 7565 7000 Fax: +44 (0)20 7565 7101 E-Mail: tate@sandberg.co.uk Website: www.sandberg.co.uk</p>	
Testing performed by the Organisation at the locations specified below		

Locations covered by the organisation and their relevant activities

Laboratory locations:

Location details	Activity	Location code
<p>Address 5 Carpenters Place Clapham High Street London SW4 7TD</p> <p>Contact: Mr P Tate Tel: +44 (0)20 7565 7000 Fax: +44 (0)20 7565 7101 E-Mail: tate@sandberg.co.uk Website: www.sandberg.co.uk</p>	Testing of asbestos, aggregates, bricks and blocks, concrete, construction materials, cement, mortar, paints, rock, roofing slate, building stone and natural stone	A
<p>Address Network Rail TV4 C/o Network Rail TV 4 Project Office Burton Road Lichfield Staffordshire WS73 8LL</p> <p>Contact: Mr T Denton</p>	Sampling and testing of aggregates, concrete and soils for civil engineering purposes	E
<p>Address London Project Laboratory Midland Shed CTRL 103/105 Old Potato Yard King's Cross Lands York Way London N1 0AS</p> <p>Contact: Mr J Gallagher Tel: +44 (0)20 7713 9563 Fax: +44 (0)20 7713 9588</p>	Sampling and testing of aggregates, concrete and soils for civil engineering purposes including in-situ ground investigation testing	B

Site activities performed away from the locations listed above:

Location details	Activity	Location code
All sites suitable for the activities listed	Sampling and testing of concrete structures, floors and other paved surfaces. Sampling of aggregates, fresh concrete and soils for civil engineering purposes including in-situ ground investigation testing	D



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DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
AGGREGATES	Water-soluble chloride salt content	BS EN 1744-1:1998	A
	Sulphate content of a 2:1 water/aggregate extract	BS EN 1744-1:1998	A
	Total sulphate content by acid extraction	BS EN 1744-1:1998	A
	Acid-soluble material content	BS 812:Part 119:1985	A
	Potential reactivity (chemical method)	ASTM C289-01	A
	Petrographic examination of aggregates for concrete	ASTM C295-03	A
	Qualitative and quantitative petrographic description of aggregates	BS 812:Part 104:1994	A
	Petrographic description	BS EN 932-3:1997	A
	Identification of type and variety, mineralogical composition, particle characterization, weathering and alteration, potential alkali-silica and alkali-carbonate reactive ingredients	Documented In-House Method No TP/G1/3 using optical microscopy and polarized light techniques	A
	Aggregate crushing value - particle size 10mm and greater	BS 812:Part 110:1990	A
	Aggregate crushing value - particle size smaller than 10mm	BS 812:Part 110:1990	A
Ten per cent fines value - dry - particle size 10mm and greater	BS 812:Part 111:1990	A, B	



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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
AGGREGATES (cont'd)	Ten per cent fines value - soaked - particle size 10mm and greater	BS 812:Part 111:1990	A, B
	Ten per cent fines value - dry - particle size smaller than 10mm	BS 812:Part 111:1990	A, B
	Ten per cent fines value - soaked - particle size smaller than 10mm	BS 812:Part 111:1990	A, B
	Particle density and water absorption for aggregate all larger than 10mm	BS EN 1097-6:2000 BS 812:Part 2:1995	A
	Particle density and water absorption for aggregate between 40mm and 5mm	BS EN 1097-6:2000 BS 812:Part 2:1995	A
	Particle density and water absorption for aggregate between 10mm nominal size and smaller	BS EN 1097-6:2000 BS 812:Part 2:1995	A
	Particle size distribution - washing and sieving	BS EN 933-1:1997 BS 812:Part 103 Section 103.1:1985	A, B A, B
	Particle size distribution - dry sieving	BS 812:Part 103 Section 103.1:1985	A, B
	Flakiness index	BS EN 933-3:1997 BS 812:Part 105 Section 105.1:1989	A, B A, B
	Shell content	BS EN 933-7:1998 BS 812:Part 106:1985	A
	Moisture content/water content - oven drying method	BS EN 1097-5:1999 BS 812:Part 109:1990	A, B A, B
Aggregate impact value - dry	BS 812:Part 112:1990	A	



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AGGREGATES (cont'd)	Aggregate impact value - soaked	BS 812:Part 112:1990	A
	Aggregate abrasion value	BS 812:Part 113:1990 BS EN 1097-8:1999 Annex A	A
	Drying shrinkage	BS 812:Part 120:1989 BS EN 1367-4:1998	A
	Soundness	BS 812:Part 121:1989	A
	Magnesium sulphate soundness	BS EN 1367-2:1998	A
	Resistance to fragmentation by the Los Angeles method	BS EN 1097-2:1998	A
	Gel-pat test for the detection of opaline silica	BS 7943:1999 Annex B	A
	Sampling coarse, fine and all-in aggregates - from heaps - from a lorry-load - from laid material	BS 812:Part 102:1989	B, D
AGGREGATES for railway ballast	Methods for sampling	BS EN 932-1:1997	E
	Modified Los Angeles method	BS EN 13450:2002	A
AIR-COOLED BLASTFURNACE SLAG AGGREGATE for use in construction	Stability - 'Falling' or 'dicalcium silicate' unsoundness	BS 1047:1983 Clause A.3.2	A



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ASBESTOS IN BULK MATERIALS including materials and products suspected of containing asbestos	<u>Health and Hygiene Tests</u>	Health and Safety Executive Asbestos: The analysts' guide for sampling, analysis and clearance procedures (HSG 248)	
	Identification of: Amosite Chrysotile Crocidolite Fibrous Actinolite Fibrous Anthophyllite Fibrous Tremolite	HSG 248:February 2005 by Documented In-House Method No. TP/G10/2 - using stereo-microscopy, polarized light microscopy and dispersion staining	A
CLAY BRICKS	Soluble salt content	BS 3921:1985	A
	Petrographic examination	Documented In-House Method TP/G29 based on ASTM C856	A
	Dimensions	BS 3921:1985	A
	Compressive strength	BS 3921:1985	A
CEMENT	Water absorption	BS 3921:1985	A
	Loss on ignition	BS EN 196-2:2005	A
	Gravimetric determination of sulphate	BS EN 196-2:2005	A
	Residue insoluble in hydrochloric acid and sodium carbonate	BS EN 196-2:2005	A
	Chloride content	BS EN 196-2:2005	A
	Alkali content (reference method)	BS EN 196-2:2005	A
	Chemical analysis of Portland cement	Documented In-House Method No. 11.1 based on BS 4550:Part 2:1970	A
	Compressive strength of concrete cubes	BS 4550:Part 3 Section 3.4L1978	A



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CEMENT (cont'd)	Flexural strength	BS EN 196-1:2005	A
	Compressive strength	BS EN 196-1:2005	A
	Standard consistence	BS 4550:Part 3 Section 3.5:1978	A
	Setting times	BS 4550:Part 3 Section 3.6:1978	A
	Soundness	BS 4550:Part 3 Section 3.7:1978	A
	Standard consistence	BS EN 196-3:2005	A
	Setting time	BS EN 196-3:2005	A
	Soundness	BS EN 196-3:2005	A
	Fineness - air permeability (Blaine) method	BS EN 196-6:1992	A
	'Absolute' specific surface of a reference cement	BS EN 196-6:1992 National Annex NB	A
	Density	BS EN 196-6:1992 National Annex C	A
PULVERISED - FUEL ASH	Chloride	BS EN 196-2:2005	A
	Calcium oxide content	BS EN 196-2:2005	A
	Sulphuric anhydride	BS EN 196-2:2005	A
	Loss on ignition	BS EN 196-2:2005	A
	Initial setting time	BS EN 196-3:2005	A
	Soundness	BS EN 196-3:2005	A
	Particle density	BS EN 196-6:1992	A



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CONCRETE - fresh	Flow table test	BS EN 12350-5:2000	B
	Slump	BS EN 12350-2:2000	B, E
	Sampling fresh concrete on site	BS EN 12350-1:2000	B, E
	Making and curing specimens for strength tests	BS EN 12390-2:2000	B, E
CONCRETE - hardened	Cement and aggregate content	BS 1881:Part 124:1988	A
	Chloride content	BS 1881:Part 124:1988 and Documented In-House Method 14.8.1 based on BS 1881:Part 124:1988	A
	Sulphate content	BS 1881:Part 124:1988	A
	Sodium oxide and potassium oxide	BS 1881:Part 124:1988	A
	Alumina and iron oxides	BS 1881:Part 124:1988 and Documented In-House Method 34.1	A
	Chemical analysis and aggregate content	Documented In-House Method 14.0	A
	Bulk chloride diffusion of concrete cores	Documented In-House Method No. TP/F/18	A
	Type of cement	BS 1881:Part 124:1988 Clause 8.3	A
	Air-void content - by modified point count method	ASTM C457-06	A
	Petrographic examination	ASTM C856-04	A
Equivalent water/cement ratio by microporosity assessment	Documented In-House Method No. TP/G8 using optical microscopy with UV illumination and fluorescent dyes	A	



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CONCRETE - hardened (cont'd)	Depth and degree of carbonation	Documented In-House Method No. TP/G7/1 using chemical staining, optical microscopy and polarized light	A
	Compressive strength of cubes - including curing	BS 1881:Part 116:1983 BS 1881:Part 111:1983	A,
		BS EN 12390-1:2000 BS EN 12390-2:2000 BS EN 12390-3:2000	A, B, E
		Compressive strength of cores	BS 1881:Part 120:1983 BS EN 12504-1:2000
	Compressive strength of cores	Documented In-House Method No. TP/F/17 (June 1996) based on BS 1881:Part 120:1983	A
	Compressive strength of cores	Documented In-House Method using Concrete Society Technical Report No. 11:1976 and addendum 1987	A
	Density	BS 1881:Part 114:1983 BS EN 12390-7:2000	A, A, B, E
	Water absorption	BS 1881:Part 122:1983	A
	Aggregate grading	BS 1881:Part 124:1988	A
	Thermal coefficient of linear expansion	Documented In-House Method No. TP/F/4	A
CONCRETE STRUCTURES	Carbonation	BRE Information Paper IP 6/81	D
	Surface hardness by rebound hammer	BS EN 12504-2:2001	D
	Coring	BS EN 12504-1:2000	D
	Sampling of concrete by dust drilling	Documented In-House Method No. TP/F/11	D



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CONCRETE STRUCTURES (cont'd)	Location of reinforcement	BS 1881:Part 204:1988	D
	Half -cell potential of uncoated reinforcing steel in concrete	ASTM C876	D
MORTAR for bricklaying, plastering and rendering	Chemical analysis	BS 4551:2005	A
	Mix proportions	Documented In-House Method No. 34.1	A
CONCRETE PAVING FLAGS	Dimensions	BS EN 1339:2003	A
	Transverse strength	BS EN 1339:2003	A
	Water absorption	BS EN 1339:2003	A
PAVED SURFACES, FLOORS and FLOOR COVERINGS	Slip resistance (pendulum tester)	BS EN 1341:2000 BS EN 1342:2001 BS EN 14231:2003	A, D
	Slip resistance value and coefficient of friction	BS 7976-2:2002	A, D
ROCK	Description and classification	BS 5930:1999 Section 44	A
	Petrographic description	ISRM Suggested Methods - Rock Characterization Testing and Monitoring, Ed. E T Brown-1981	A
	Microcrack dye testing of granite	Documented In-House Method TP/G27-01	A, D
ROOFING SLATES	Sulphuric acid immersion	BS 680:Part 2:1971 BS 5642-1:1978 (Appendix A)	A
	Water absorption	BS 680:Part 2:1971	A
	Wetting and drying	BS 680:Part 2:1971 BS 5642 -1:1978 (Appendix B)	A
	Modulus of rupture	ASTM C120-06	A



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SLATE AND STONE PRODUCTS for discontinuous roofing and cladding	Petrographic examination (excluding X-ray diffraction)	BS EN 12326-2:2000:clause17	A
	Failure load in bending	BS EN 12326-2:2000:clause 10	A
	Length and width	BS EN 12326-2:2000:clause 5	A
	Edge deviation	BS EN 12326-2:2000:clause 6	A
	Rectangularity	BS EN 12326-2:2000:clause 7	A
	Thickness	BS EN 12326-2:2000:clause 8	A
	Flatness deviation	BS EN 12326-2:2000:clause 9	A
	Freeze thaw resistance	BS EN 12326-2:2000:clause 12	A
	Thermal cycling	BS EN 12326-2:2000:clause 16	A
	Water absorption	BS EN 12326-2:2000:clause 11	A
	Carbonate content	BS EN 12326-2:2000:clause 14	A
BUILDING STONE	Sulfur dioxide exposure (CaCO ₃ <= 20%)	BS EN 12326-2:2000:clause 15.1:	A
	Compressive strength	ASTM C170-90 (1999)	A
	Flexural strength	ASTM C880-06	A
	Modulus of rupture	ASTM C99-87 (2006)	A
	Acid immersion	Durability Tests for Building Stone (BRE Report BR141:1983)	A
	Crystallisation	Durability Tests for Building Stone (BRE Report BR141:1983)	A
	Saturation coefficient and porosity	Durability Tests for Building Stone (BRE Report BR141:1983)	A
	Absorption and bulk specific gravity	ASTM C97-02	A
Abrasion resistance	ASTM C241-90 (2005)	A	



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BUILDING STONE (cont'd)	Microporosity (water)	Documented In-House Method No. TP/G24/1 based on BRE Report - The Building Limestones of the British Isles:1983	A
NATURAL STONE (natural stone products for building purposes)	Dimensions	BS EN 1341:2001 BS EN 1342:2001 BS EN 1343:2001	A
	Petrographic description	BS EN 12407:2000	A
	Flexural strength under concentrated load (3 point loading method)	BS EN 12372:2006	A
	Flexural strength under constant moment	BS EN 13161:2001	A
	Compressive strength	BS EN 1926:2006 BS EN 1342:2001	A
	Breaking load at dowel hole	BS EN 13364:2002	A
	Abrasion resistance	BS EN 1341:2001 Annex C BS EN 1342:2001 Annex B BS EN 14157:2004 Method A (wide wheel)	A
	Resistance to salt crystallisation	BS EN 12370:1999	A
	Water absorption coefficient by capillarity	BS EN 1925:1999	A
	Water absorption at atmospheric pressure	BS EN 13755:2002 BS EN 1341:2001 BS EN 1342:2001 BS EN 1343:2001	A
	Real density and total porosity	BS EN 1936:2006	A
	Apparent density and open porosity	BS EN 1936:2006	A
Frost resistance	DIN 52 104:1982 Method A	A	



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NATURAL STONE (cont'd)	Frost resistance	Documented In-House Method No. TP/G19/2 based on BS EN 12371:2001	A
	Resistance to ageing by thermal shock	BS EN 14066:2003	A
	Unpolished slip resistance (pendulum tester)	BS EN 1341:2000 BS EN 1342:2001 BS EN 14231:2003	A, D
	Sound speed propagation	BS EN 14579:2004	A
PAINT and AIR FILTERS used in air monitoring	Lead content	Documented In-House Method No. 40.3 using atomic absorption spectrophotometry	A
SALT for spreading on highways for winter maintenance	Matter insoluble in water	BS 3247:1991	A
	Chloride content	BS 3247:1991	A
	Soluble sulphate compounds	BS 3247:1991	A
	Moisture content	BS 3247:1991	A
	Grading by sieve analysis	BS 3247:1991	A
WATER for making concrete	Suitability	BS EN 1008:2002	A
	Compressive strength of cubes	BS EN 1008:2002 BS 3148:1980	A
	Initial setting time	BS EN 1008:2002 BS 3148:1980	A
SOILS for civil engineering purpose	Moisture content - oven drying method	BS 1377:Part 2:1990	B, E
	Liquid limit - cone penetrometer	BS 1377:Part 2:1990	B,
	Plastic limit	BS 1377:Part 2:1990	B,
	Plasticity index and liquidity index	BS 1377:Part 2:1990	B,



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SOILS for civil engineering purpose (cont'd)	Particle density - gas jar	BS 1377:Part 2:1990	B
	Particle size distribution - wet sieving	BS 1377:Part 2:1990	B, E
	Particle size distribution dry sieving	BS 1377:Part 2:1990	B, E
	Moisture condition value (MCV)	BS 1377:Part 4:1990	B, D
	California Bearing Ratio (CBR)	BS 1377:Part 4:1990	B
	Dry density/moisture content relationship (2.5 kg rammer)	BS 1377:Part 4:1990	B, E
	Dry density/moisture content relationship (4.5 kg rammer)	BS 1377:Part 4:1990	B, E
	Dry density/moisture content relationship (vibrating hammer)	BS 1377:Part 4:1990	B, E
	In-situ California Bearing Ratio (CBR)	BS 1377:Part 9:1990	B, D
	In-situ density - nuclear method	BS 1377:Part 9:1990	B, D, E
	Equivalent CBR values and vertical deformation and strength characteristics of soil by the plate loading test	BS 1377:Part 9:1990 and Method Statement LPL/TP/01	B, D
	Determination of elastic moduli of subgrade reaction by the plate loading test	BS 1377:Part 9:1990 and Method Statement LPL/TP/04	B, D
Sampling earthwork materials - from stockpiles - from laid material	Documented In-House Method No. STP 06	B, D	

END