



Stanger Asia Limited
史達嘉亞洲有限公司

ADDRESS : Rooms 503 - 504, 5/F. & 705 - 706, 7/F., Fuk Shing Commercial Building,
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ADDRESS
地址

Main Laboratory : Rooms 503 - 504, 5/F. & 705 - 706, 7/F., Fuk Shing Commercial Building,
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Branch Laboratory : DD 83 Lot 549, 553, 556 Sha Tau Kok Road, Fanling, New Territories, Hong Kong
香港新界粉嶺沙頭角公路 83 區 549, 553 及 556 地段

ACCREDITED TEST : Calibration Services 校正服務
CATEGORY : Construction Materials 建築材料
認可測試類別

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Calibration Services 校正服務		
ITEM TESTED OR MEASURED 測試或量度項目	SPECIFIC TEST OR PROPERTY MEASURED[@] 特定測試或量度的特性 [@]	CALIBRATION AND MEASUREMENT CAPABILITY (CMC)* 校準和測量能力*
Construction materials testing equipment		
- Compacting bar	Verification of following parameters in accordance with in-house procedure CAL120 for requirements in CS 1: 1990: Vol. 1 (Amd. 1102) App. A9, or CS 1: 2010: Vol. 1 App. A10 Dimensions of ramming face: 25 mm x 25 mm Length: 380 mm Mass: 1.8 kg	0.06 mm 0.67 mm 0.7 g
- Concrete test cube mould	Verification of following parameters in accordance with in-house procedure CAL006 for requirements in CS 1: 1990: Vol. 1 App. A21 (excluding surface texture measurement), or CS 1: 2010: Vol. 1 App. A25 Dimensions: 100 mm or 150 mm Thickness of base plate: minimum 10 mm Flatness: not more than 0.03 mm or 0.06 mm Squareness / Perpendicularity: 0.5 mm Parallelism: 1 mm	0.06 mm 0.04 mm 0.03 mm 0.03 mm 0.06 mm
- Curing tank	On-site verification of following parameter in accordance with in-house procedure CAL096H for requirements in CS1: 1990: Vol. 1 App. A24, or CS1: 2010: Vol. 1 App. A28 - temperature distribution at a range of (27 ± 3) °C On-site verification of following parameter in accordance with in-house procedure CAL095H for requirements in CS1: 1990: Vol. 1 App. A24, or CS1: 2010: Vol. 1 App. A28 - efficiency of circulation	0.5 °C 33 s

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Construction materials testing equipment (cont'd) - Slump cone - Tamping rod	Verification of following parameters in accordance with in-house procedure CAL014 for requirements in CS1: 1990 Vol. 1 (AMD 1102) App. A4, or CS1: 2010 Vol. 1 App. A5 Internal diameter of base: 200 mm Internal diameter of top: 100 mm Height: 300 mm Wall thickness: minimum 1.5 mm Verification of following parameters in accordance with in-house procedure CAL014 for requirements in CS1: 1990 Vol. 1 (AMD 1102) App. A5, or CS1: 2010 Vol. 1 App. A6 Diameter: 16 mm Length: 600 mm	0.17 mm 0.17 mm 0.67 mm 0.05 mm 0.05 mm 0.68 mm

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Length and related quantities - Length - Dial gauge - Digital indicator - Linear displacement transducer (LVDT)	Calibration for length in accordance with AS 2103: 1978 Cl. 2.4.4 and App. A5 over the following range : 0 mm to 100 mm Calibration for length in accordance with GEOSPEC 3: 2001 App. A.3.4.2 over the following ranges : 0 mm to 13 mm above 13 mm to 50 mm Calibration for length in accordance with in-house method CAL310-1 over the following ranges : 0 mm to 13 mm above 13 mm to 50 mm Calibration for length in accordance with GEOSPEC 3: 2001 App. A.3.4.2 over the following range : 0 mm to 100 mm	5 μm 1.5 μm 5.1 μm 1.5 μm 5.1 μm 6.9 μm

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<p>Mass and related quantities</p> <p>- Force</p> <p>- Load cell</p>	<p>Calibration for compressive force in accordance with in-house method CAL1006 over the following ranges :</p> <p>1 kN to 120 kN above 120 kN to 520 kN</p> <p>Calibration for compressive force In accordance with GEOPEC 3: 2001 App. A.3.1 over the following ranges :</p> <p>1 kN to 120 kN above 120 kN to 500 kN</p> <p>Calibration for compressive force in accordance with in-house method CAL1007-1 over the following ranges :</p> <p>1 kN to 120 kN above 120 kN to 500 kN</p>	<p>1.0 % of reading 0.7 % of reading</p> <p>1.0 % of reading 0.7 % of reading</p> <p>1.0 % of reading 0.7 % of reading</p>

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Mass and related quantities (cont'd) - Force (cont'd) - Proving ring	Calibration for compressive force in accordance with GEOSPEC 3: 2001 App. A.3.1 over the following ranges : 1 kN to 2 kN above 2 kN to 10 kN above 10 kN to 50 kN Calibration for compressive force in accordance with in-house method CAL1007-1 over the following ranges : 1 kN to 2 kN above 2 kN to 10 kN above 10 kN to 50 kN	0.9 % of reading 0.5 % of reading 0.8 % of reading 0.9 % of reading 0.5 % of reading 0.8 % of reading
- Pull-off equipment	Calibration for tensile force in accordance with in-house method CAL1002 over the following ranges : 1 kN to 2 kN above 2 kN to 4 kN above 4 kN to 10 kN	1.2 % of reading 0.7 % of reading 0.4 % of reading

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Mass and related quantities (cont'd) - Hardness - Hardness testing machine	On-site indirect verification of testing machine for Vickers hardness scale in accordance with BS EN ISO 6507: Part 2: 1998 over the following range : 150 HV30 to 750 HV30	2.6 % HV30

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Concrete (chemical analysis)	Chloride content	BS EN 14629: 2007 Method A <i>excluding</i> Cl. 4.1 BS 1881: Part 124: 1988 Cl. 10.2 CS 1: 2010 Section 21.10.2
	Chloride content by weight of concrete sample	BS 1881: Part 124: 1988 Cl. 10.2 in conjunction with In-house method CHEM06-S (by calculation) CS 1: 2010 Section 21.10.2 in conjunction with In-house method CHEM06-S (by calculation)
	Sulphate content	BS 1881: Part 124: 1988 Cl. 10.3 CS 1: 2010 Section 21.10.3
	Sulphate content by weight of concrete sample	BS 1881: Part 124: 1988 Cl. 10.3 in conjunction with In-house method CHEM07-S (by calculation) CS 1: 2010 Section 21.10.3 in conjunction with In-house method CHEM07-S (by calculation)
	Cement content (By calcium oxide determination)	BS 1881: Part 124: 1988 Section 5.4 & 5.9 <i>excluding</i> Cl. 5.9.4
	Cement and Aggregate content (By calcium oxide determination)	CS 1: 2010 Section 21.6.4, 21.6.6 & 21.6.7
	Aggregate / Cement ratio (By calcium oxide determination)	BS 1881: Part 124: 1988 Section 5.9 <i>excluding</i> Cl. 5.9.4
	Detection of PFA	CS 1: 2010 Section 21.5
pH value	Hong Kong Housing Authority Materials Testing Services Term Contract (2020/2022) for Construction Materials (Package A1) Part D Cl. 1.4.14	

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Soil (chemical analysis)	Organic matter content	GEOSPEC 3: 2017 Test 9.1
	Loss-on-ignition (L.O.I)	GEOSPEC 3: 2017 Test 9.2
	Total sulphate content (as SO ₃)	GEOSPEC 3: 2017 Test 9.3
	Water-soluble sulphate content (as SO ₃)	GEOSPEC 3: 2017 Test 9.3
	Water-soluble chloride content	GEOSPEC 3: 2017 Test 9.4
	pH value	GEOSPEC 3: 2017 Test 9.5
Ground water (chemical analysis)	Sulphate content (as SO ₃)	GEOSPEC 3 : 2017 Test 9.3
	pH value	GEOSPEC 3 : 2017 Test 9.5

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Metallic materials (non-destructive)	Ultrasonic test of H beams with parallel flanges (manual method)	BS EN 10306: 2002
	Ultrasonic test of metallic materials (reflection method)	BS 5996: 1993 BS EN 10160: 1999
	Welds (non-destructive)	Liquid penetrant test (Colour contrast method)
	Magnetic particle test (Magnetic flow method colour contrast and fluorescent method(s) using permanent magnets & A.C. yokes)	BS 6072: 1981 + Amd. 3960, 4542 & 4843 BS EN 1290: 1998 BS EN ISO 9934-1: 2001 BS EN ISO 17638: 2009 in conjunction with the following specification(s): BS 5135: 1984 Table 18 & 19 BS 5400-6: 1999 Cl. 5.5.2.4.1 BS EN ISO 5817: 2003 Table 1 BS EN ISO 5817: 2007 Table 1 BS EN ISO 5817: 2014 Table 1 Buildings Department Code of Practice for Structural Use of Steel (2011) Table 14.3b
	Radiographic examination (Gamma Ray)	BS EN 1435: 1997 in conjunction with the following specification(s): BS 5135: 1984 Table 18 & 19 BS 5400-6: 1999 Cl. 5.5.2.4.2 BS EN ISO 5817: 2003 Table 1 BS EN ISO 5817: 2007 Table 1 BS EN ISO 5817: 2014 Table 1 Buildings Department Code of Practice for Structural Use of Steel (2011) Table 14.3b

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Welds (non-destructive) (Cont'd)	Ultrasonic test (Butt welds in plates & pipes, 'T' joint welds, nozzle welds & node welds) Visual examination Visual examination on stud shear connectors	BS 3923: Part 1: 1986 (Level 1, 2a, 2b & 3) BS EN 1714: 1998 + Amd. 10286 (Level A, B & C) BS EN ISO 17640: 2010 (Level A, B & C) in conjunction with the following specification(s): BS 5135: 1984 Table 18 & 19 BS 5400-6: 1999 Cl. 5.5.2.4.2 BS EN ISO 5817: 2003 Table 1 BS EN ISO 5817: 2007 Table 1 BS EN ISO 5817: 2014 Table 1 Buildings Department Code of Practice for Structural Use of Steel (2011) Table 14.3b BS 5289: 1976 BS EN 970: 1997 BS EN ISO 17637: 2011 in conjunction with the following specification(s): BS 5135: 1984 Table 18 & 19 BS 5400-6: 1999 Cl. 5.5.2.4.1 BS EN ISO 5817: 2003 Table 1 BS EN ISO 5817: 2007 Table 1 BS EN ISO 5817: 2014 Table 1 Buildings Department Code of Practice for Structural Use of Steel (2011) Table 14.3b BS 5289: 1976 BS EN 970: 1997 BS EN ISO 17637: 2011 in conjunction with the following specifications: BS 5400-6: 1999 Cl. 4.7.4 & 5.5.4 BS EN ISO 14555: 2017 Cl. 11.2 & 12.2 Buildings Department Code of Practice for Structural Use of Steel (2011) Cl. 14.3.7.3

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<p>Mass and related quantities</p> <p>- Force</p> <p>- Load cell</p> <p>- Load cell with hydraulic jack</p>	<p>Calibration for compressive force in accordance with in-house method CAL1008 over the following ranges :</p> <p>300 kN to 800 kN above 800 kN to 6000 kN above 6000 kN to 15000 kN</p> <p>Calibration for compressive force in accordance with in-house method CAL1008 over the following ranges :</p> <p>300 kN to 500 kN above 500 kN to 800 kN above 800 kN to 6000 kN above 6000 kN to 15000 kN</p>	<p>1.1 % of reading 0.8 % of reading 1.2 % of reading</p> <p>2.0 % of reading 1.3 % of reading 0.9 % of reading 1.3 % of reading</p>

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Thermometry - Temperature - Digital thermometer	Calibration for temperature using water bath in accordance with in-house method CAL450 over the following ranges: 10 °C to 50 °C above 50 °C to 95 °C Calibration for temperature using drywell in accordance with in-house method CAL450 over the following range: above 50 °C to 350 °C	0.08 K 0.18 K 0.34 K

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Adhesive	Pull-off test of plaster Pull-off test of render Pull-off test of repair mortar Pull-off test of tiles	In-house method DIA 06 In-house method DIA 02 Hong Kong Housing Authority Materials Testing Services (2017/2018) for Maintenance & Building Materials Specification Part D Cl. 2.1.15 Method 1 In-house method DIA 30 (coring method) In-house method DIA 31 (saw-cut method)
Coating	Pull-off test of adhesion Pull-off test of coating	In-house method DIA 36 BS 3900-E10: 2003 Cl. 9.4.2 BS EN ISO 4624: 2003 Cl. 9.4.2 BS EN ISO 4624: 2016 Cl. 8.4.2
Concrete	Sampling fresh concrete on site Slump of fresh concrete Flow table test Density of compacted fresh concrete Making test cubes from fresh concrete Curing of test specimens (Tropical zone temperature)	BS EN 12350-1: 2009 CS1: 1990 Section 1 + Amd. 1101 CS1: 2010 Section 1 BS EN 12350-2: 2009 CS1: 1990 Section 2 + Amd. 1101 & 1102 CS1: 2010 Section 2 Part I CS1: 2010 Section 2 Part IV BS EN 12350-6: 2009 CS1: 2010 Section 5 BS EN 12390-2: 2009 CS1: 1990 Section 7 + Amd. 1101 & 1102 CS1: 2010 Section 7 CS1: 1990 Section 10 + Amd. 1101 CS1: 2010 Section 10

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Concrete (cont'd)	<p>Compressive strength of concrete cubes in the force range 20 kN - 3000 kN</p> <p>Compressive strength of concrete cores in the force range 20 kN - 2000 kN</p> <p>in the force range 20 kN - 3000 kN</p> <p>Obtaining core samples</p> <p>Density of hardened concrete</p> <p>Flow table test</p> <p>Water absorption</p>	<p>BS EN 12390-3: 2019 CS1: 1990 Section 12 + Amd. 1201, 1202 & 1203 CS1: 2010 Section 12</p> <p>BS EN 12504-1: 2019 CS1: 1990 Section 15 + Amd. 1201, 1203 & 1205 CS1: 2010 Section 15</p> <p>CS1: 2010 Section 15 In-house Method DIA 19</p> <p>BS EN 12390-7: 2019 CS1: 1990 Section 16 + Amd. 1201 & 1203 CS1: 2010 Section 16</p> <p>BS 1881: Part 105: 1984 CS1: 1990 Section 22 + Amd. 1206</p> <p>BS 1881: Part 122: 2011 +A1: 2020</p>

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Concrete (cont'd)	Removal of concrete cover to expose reinforcement	Hong Kong Housing Authority Materials Testing Services (2002/2004) for Maintenance & Building Materials Specification Part D Cl. 4.2.1 Hong Kong Housing Authority Materials Testing Services (2017/2018) for Maintenance & Building Materials Specification Part D Cl. 4.2.1
	Cutting out reinforcement	Hong Kong Housing Authority Materials Testing Services (2002/2004) for Maintenance & Building Materials Specification Part D Cl. 4.2.3
	Moisture content by weighing drilling powder	Hong Kong Housing Authority Materials Testing Services (2002/2004) for Maintenance & Building Materials Specification Part D Cl. 4.3.8 Method 1
	Moisture content by weighing minicores	Hong Kong Housing Authority Materials Testing Services (2002/2004) for Maintenance & Building Materials Specification Part D Cl. 4.3.8 Method 2
	Crack survey	Hong Kong Housing Authority Materials Testing Services (2002/2004) for Maintenance & Building Materials Specification Part D Cl. 4.3.14 Hong Kong Housing Authority Materials Testing Services (2017/2018) for Maintenance & Building Materials Specification Part D Cl. 4.3.14
	Obtaining drilling powder samples	Hong Kong Housing Authority Materials Testing Services (2002/2004) for Maintenance & Building Materials Specification Part D Cl. 6.4 Hong Kong Housing Authority Materials Testing Services (2017/2018) for Maintenance & Building Materials Specification Part D Cl. 6.4
	Heat of hydration monitoring (temperature monitoring of concrete structure)	In-house method CON22
	Temperature rise evaluation test	In-house method CON22-1

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Concrete (diagnostic)	<p>Carbonation test</p> <p>Covermeter survey</p> <p>Half-cell potential measurement</p> <p>Infrared thermography for detection of building surface defects</p> <p>Resistivity measurement</p> <p>Surface hardness measurement</p> <p>Surface penetration radar survey</p> <p>Ultrasonic pulse velocity measurement (by direct, semi-direct and indirect measurement)</p>	<p>BS EN 14630: 2006 Building Research Establishment Information IP 6/81 Hong Kong Housing Authority Materials Testing Services (2002/2004) for Maintenance & Building Materials Specification Part D Cl. 4.3.1 Method 1 & Method 2 Hong Kong Housing Authority Materials Testing Services (2017/2018) for Maintenance & Building Materials Specification Part D Cl. 4.3.1 Method 1 & Method 2</p> <p>BS 1881: Part 204: 1988 + Amd. 6201 Hong Kong Housing Authority Materials Testing Services (2002/2004) for Maintenance & Building Materials Specification Part D Cl. 4.3.2 Method 1 & Method 2 Hong Kong Housing Authority Materials Testing Services (2017/2018) for Maintenance & Building Materials Specification Part D Cl. 4.3.2 Method 1 & Method 2</p> <p>ASTM C876-87 ASTM C876-91 ASTM C876-15 Hong Kong Housing Authority Materials Testing Services (2002/2004) for Maintenance & Building Materials Specification Part D Cl. 4.3.4 & 4.3.5 Hong Kong Housing Authority Materials Testing Services (2017/2018) for Maintenance & Building Materials Specification Part D Cl. 4.3.4 & 4.3.5</p> <p>Hong Kong Concrete Institute TM1 (2009) Hong Kong Concrete Institute TM1 Issue 2 (2022)</p> <p>BS 1881: Part 201: 1986 Cl. 2.3 Hong Kong Housing Authority Materials Testing Services (2002/2004) for Maintenance & Building Materials Specification Part D Cl. 4.3.6 Hong Kong Housing Authority Materials Testing Services (2017/2018) for Maintenance & Building Materials Specification Part D Cl. 4.3.6</p> <p>BS 1881: Part 202: 1986 BS EN 12504-2: 2001 BS EN 12504-2: 2012 BS EN 12504-2: 2021</p> <p>Hong Kong Concrete Institute TM2 (2009)</p> <p>BS 1881: Part 203: 1986 BS EN 12504-4: 2021</p>

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Controlled low strength material	Flowability Load placement capacity (by ball drop test)	ASTM D6103/D6103M-17 in conjunction with the following specification(s): Highways Department Guidance Notes on Use of Self-compacting Backfill Material RD/GN/049 (Sep 2022) ASTM D6024/D6024M-16 in conjunction with the following specification(s): Highways Department Guidance Notes on Use of Self-compacting Backfill Material RD/GN/049 (Sep 2022)

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Foundation	<p>Crosshole sonic logging test (SOLT)</p> <p>Pile dynamic test (PDA)</p> <p>Pile integrity test (PIT)</p> <p>Plate load test (PLT)</p> <p>Compression static loading test (SLT)</p> <p>Compression static loading test on piles (SLT) using multiple hydraulic jacks and load cells</p> <p>Tension static loading test (SLT)</p> <p>Tension static loading test on piles using multiple hydraulic jacks and load cells</p> <p>Ultrasonic echo sounder test (UEST)</p>	<p>ASTM D6760-02 ASTM D6760-08 ASTM D6760-14 ASTM D6760-16</p> <p>ASTM D4945-00 ASTM D4945-08 ASTM D4945-12 ASTM D4945-17</p> <p>ASTM D5882-00 ASTM D5882-16</p> <p>BS 1377: Part 9: 1990 Cl. 4.1 (incremental loading) Buildings Department Code of Practice for Foundations (Apr 2017) Cl. 8.2(2) excluding 8.2(2)(f) to (h)</p> <p>Architectural Services Department General Specification for Building (2012) Section 5.28 Architectural Services Department General Specification for Building (2017) Section 5.29 Buildings Department APP-18 (Feb 2012) Cl. 20-21 Buildings Department Code of Practice for Foundations (2017) Cl. 8.4 Hong Kong Housing Authority Specification Library (2014) Cl. PIL1.T710.7 to PIL1.T920.7 & Cl. PIL1.T1010.7 to PIL1.T1110.7 General Specification for Civil Engineering Works (2006) Vol. 1 App. 8.1 General Specification for Civil Engineering Works (2020) Vol. 1 App. 8.1</p> <p>In-house method STA06</p> <p>Architectural Services Department, Technical Instruction No. 04/2005 (revision date: Jun 2019) Particular Specification for Tension Piles Buildings Department Code of Practice for Foundations (2017) Cl. 8.10</p> <p>In-house method STA07</p> <p>In-house method PIL10-KTMS</p>

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Grout	Flow of grout for preplaced-aggregate concrete (flow cone method) Bleeding and free expansion Making and curing test cubes Compressive strength of grout cubes in the force range 20 kN - 3000 kN	ASTM C939-02 General Specification for Civil Engineering Works (2006) Vol. 2 Cl. 17.59-17.60 ASTM C940-98a General Specification for Civil Engineering Works (2006) Vol. 2 Cl. 17.63 (1) & (2) CS1: 2010 Section 7 & 10 General Specification for Civil Engineering Works (2006) Vol. 2 Cl. 17.63 (1) & (2) CS1: 2010 Section 12

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Metallic materials	<p>Tensile test of metallic materials in force range 2 kN – 2000 kN</p> <p>Tensile test & slip/permanent elongation test of mechanical coupler for reinforcing bar in the force range 10 kN – 2000 kN</p> <p>Tensile test of steel reinforcing bars for reinforcement of concrete in the force range 2 kN – 2000 kN</p> <p>Tensile test of machined and unmachined specimens of bolts, screws and studs in the force range 15 kN – 1500 kN</p>	<p>BS 18: 1987 BS EN 10002-1: 2001 BS EN ISO 6892-1: 2009 Cl. 10.4 Method B in conjunction with the following specification(s): BS 4360: 1986 Cl. 23 BS 4360: 1990 Cl. 23 BS EN 10025-1: 2004 Cl. Cl. 7.3.1, 9.2.3.2 & 10.2.1 BS EN 10025-2: 2004 Cl. 10.2 & Table 7 BS EN 10025-3: 2004 Cl. 10.2 & Table 5 BS EN 10025-4: 2004 Cl. 10.2 & Table 5 BS EN 10025-5: 2004 Cl. 10.2 & Table 4 BS EN 10025-6: 2004 + A1: 2009 Cl. 10.2, Table 5 BS EN 10088-2: 2005 Cl. 7.4.2, Table 7 - 17 & 19 - 25 BS EN 10210-1: 1994 Cl. 6.6.1, 9.2 & 9.2.1 BS EN 10210-1: 2006 Cl. 6.6.1, 9.2.1 & 9.2.2 BS EN 10219-1: 2006 Cl. 6.7.1, 9.2.1 & 9.2.2</p> <p>BS EN ISO 6892-1: 2009 & ISO 15835-2: 2018 Cl. 5.4 excluding Cl. 5.4.4 in conjunction with the following specification(s): BS 8110: Part 1: 1985 Cl. 3.12.8.16.2 BS 8110: Part 1: 1997 Cl. 3.12.8.16.2 ISO 15835-1: 2018 Cl. 5.4.1 Option 2 & 5.4.2 Buildings Department Code of Practice for Structural Use of Concrete (2013) Cl. 3.2.8.3 General Specification for Civil Engineering Works (2006) Vol 2 Cl. 15.35 General Specification for Civil Engineering Works (2020) Vol 2 Cl. 15.35</p> <p>BS EN 10002-1: 2001 BS EN ISO 6892-1: 2009 Cl. 10.4 Methods B in conjunction with the following specification(s): BS 4449: 2005 + A2: 2009 Cl. 7.2.2, 7.2.3 & 8.1.3.1 & 9 BS EN ISO 15630-1: 2002 Cl. 5 BS EN ISO 15630-2: 2002 Cl. 5 CS2: 2012 (Rev. 5) Cl. 6.1 & 6.4</p> <p>BS EN ISO 6892-1: 2009 Cl. 10.4 Method B in conjunction with the following specification(s): BS EN ISO 898-1: 1999 Cl. 8.1 & 8.2</p>

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Metallic materials (cont'd)	<p>Charpy 'V' notch impact test</p> <p>Mass per meter of steel reinforcing bars</p> <p>Rebend test of steel reinforcing bars</p> <p>Static tension test, static compression test, cyclic tension & compression tests for mechanical connector systems (Type 2 Splice) for steel reinforcing bars in the force range 10 kN – 2000 kN</p> <p>Vickers hardness test in scale range HV 30</p> <p>Proof load test of steel nuts in the force range 15 kN – 1500 kN</p>	<p>BS EN 10045-1: 1990</p> <p>BS EN ISO 148-1: 2010 with modification in conjunction with the following specification(s):</p> <p>BS 4360: 1990 Cl. 25-27</p> <p>BS EN 10025-1: 2004 Cl. 10.2.2</p> <p>BS EN 10025-2: 2004 Cl. 10.2 & Table 9</p> <p>BS EN 10025-3: 2004 Cl. 10.2 & Table 6 & 7</p> <p>BS EN 10025-4: 2004 Cl. 10.2 & Table 6 & 7</p> <p>BS EN 10025-5: 2004 Cl. 10.2 & Table 5</p> <p>BS EN 10025-6: 2004 + A1: 2009 Cl. 10.2 Table 6 & 7</p> <p>BS EN 10088-2: 2005 Cl. 7.4.4, Table 8, 10 & 11</p> <p>BS EN 10210-1: 2006 Cl. 6.6.2, 9.2.3, Table A3 & B3</p> <p>BS EN 10219-1: 2006 Cl. 6.7.2, 9.2.3, Table A3, B4 & B5</p> <p>BS EN ISO 15630-1: 2002 Cl. 12</p> <p>CS2: 2012 (Rev. 5) Cl. 6.1 & 6.2</p> <p>in conjunction with the following specification(s):</p> <p>BS 4449: 2005 + A2: 2009 + A3: 2016 Cl. 7.2.2, 7.3 & 9</p> <p>BS EN ISO 15630-1: 2002 Cl. 7</p> <p>CS2: 2012 (Rev. 5) Cl. 6.1 & 6.5</p> <p>in conjunction with the following specification(s):</p> <p>BS 4449: 2005 + A2: 2009 Cl. 7.2.5 & 9</p> <p>ICC Evaluation Service, Inc. AC133 (Approved Jan 2010, Effective 1 Jul 2010) Cl. 4.1.2 with modifications in conjunction with the following specification(s):</p> <p>Buildings Department Code of Practice for Structural Use of Concrete (2013) Cl. 3.2.8.4 (b), (c) & (d)</p> <p>BS EN ISO 6507-1: 1998</p> <p>BS 3692: 2001 Annex C.1</p> <p>BS 4190: 2001 Annex A.1</p> <p>ISO 898-2: 1992 Cl. 5-7 & 8.1</p>

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Paint & varnish	Dry-film coating thickness by acoustic method Dry-film coating thickness by eddy current method Dry-film coating thickness by magnetic method	BS EN ISO 2808: 2019 (Method 10 – Ultrasonic reflection) BS EN ISO 2808: 2007, BS 3900-C5: 2007 (Method 7D) BS EN ISO 2808: 2019 (Method 7C) BS EN ISO 2178: 2016 BS EN ISO 2808: 2007, BS 3900-C5: 2007 (Method 7C) BS EN ISO 2808: 2019 (Method 7B.2)
Road surfaces	Skid resistance of road surfaces/markings using a portable pendulum tester	ASTM E303-93 (Reapproved 2018) Highways Department (Research and Development Division) Guidance Notes on Road Testing - RD/GN/009 (Sep 1989)
Rock	Pull-out test of rock dowels Point load strength index of rock by diametral and axial tests	In-house method SPRD 01 ASTM D5731-95 ASTM D5731-16 International Society for Rock Mechanics (1985) Suggested method for determining point load strength

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Soil (Phase I)	Moisture content by oven-drying at 45°C ± 5°C	GEOSPEC 3: 2001 Test 5.1 GEOSPEC 3: 2017 Test 5.1
	Moisture content by oven-drying at 105°C ± 5°C	GEOSPEC 3: 2001 Test 5.2 GEOSPEC 3: 2017 Test 5.2
	Comparative test for the determination of moisture content by oven-drying	GEOSPEC 3: 2001 Test 5.3 GEOSPEC 3: 2017 Test 5.3
	Liquid limit, plastic limit, and plasticity index	GEOSPEC 3: 2001 Test 6.1 GEOSPEC 3: 2017 Test 6.1
	Liquidity index	GEOSPEC 3: 2001 Test 6.2 GEOSPEC 3: 2017 Test 6.2
	Particle density by gas jar method	GEOSPEC 3: 2001 Test 7.1 GEOSPEC 3: 2017 Test 7.1
	Particle density by small pycnometer method	GEOSPEC 3: 2001 Test 7.2 GEOSPEC 3: 2017 Test 7.2
	Particle size distribution by wet sieving (with dispersant)	GEOSPEC 3: 2001 Test 8.1 GEOSPEC 3: 2017 Test 8.1
	Particle size distribution by wet sieving (without dispersant)	GEOSPEC 3: 2001 Test 8.2 GEOSPEC 3: 2017 Test 8.2
	Particle size distribution by hydrometer (with dispersant)	GEOSPEC 3: 2001 Test 8.5 GEOSPEC 3: 2017 Test 8.5
	Particle size distribution by hydrometer (without dispersant)	GEOSPEC 3: 2001 Test 8.6 GEOSPEC 3: 2017 Test 8.6
	Construction of a continuous particle size distribution curve from the results of wet-sieving and sedimentation tests	GEOSPEC 3: 2001 Test 8.7 GEOSPEC 3: 2017 Test 8.7

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Soil (Phase I) (cont'd)	Dry density/moisture content relationship of soils containing particles which are not susceptible to crushing (using a 1000cc mould and 2.5 kg rammer)	GEOSPEC 3: 2001 Test 10.1 GEOSPEC 3: 2017 Test 10.1
	Dry density/moisture content relationship of soils containing particles which are susceptible to crushing (using a 1000cc mould and 2.5 kg rammer)	GEOSPEC 3: 2001 Test 10.2 GEOSPEC 3: 2017 Test 10.2
	Dry density/moisture content relationship of soils containing particles which are not susceptible to crushing (using a CBR mould and 2.5 kg rammer)	GEOSPEC 3: 2001 Test 10.3 GEOSPEC 3: 2017 Test 10.3
	Dry density/moisture content relationship of soils containing particles which are susceptible to crushing (using a CBR mould and 2.5 kg rammer)	GEOSPEC 3: 2001 Test 10.4 GEOSPEC 3: 2017 Test 10.4
	Dry density/moisture content relationship of soils containing particles which are not susceptible to crushing (using a 1000cc mould and 4.5 kg rammer)	GEOSPEC 3: 2001 Test 10.5 GEOSPEC 3: 2017 Test 10.5
	Dry density/moisture content relationship of soils containing particles which are susceptible to crushing (using a 1000cc mould and 4.5 kg rammer)	GEOSPEC 3: 2001 Test 10.6 GEOSPEC 3: 2017 Test 10.6
	Dry density/moisture content relationship of soils containing particles which are not susceptible to crushing (using a CBR mould and 4.5 kg rammer)	GEOSPEC 3: 2001 Test 10.7 GEOSPEC 3: 2001 Test 10.7
	Dry density/moisture content relationship of soils containing particles which are susceptible to crushing (using a CBR mould and 4.5 kg rammer)	GEOSPEC 3: 2001 Test 10.8 GEOSPEC 3: 2017 Test 10.8

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Soil (Phase I) (cont'd)	<p>In-situ bulk density and in-situ dry density of soils by the sand replacement method suitable for fine- and medium-grained soils (with small pouring cylinder)</p> <p>In-situ bulk density and in-situ dry density of soils by the sand replacement method suitable for fine-, medium-, and coarse-grained soils (with large pouring cylinder)</p> <p>Relative compaction of fill material</p>	<p>GEOSPEC 3: 2001 Test 11.1 GEOSPEC 3: 2017 Test 11.1</p> <p>GEOSPEC 3: 2001 Test 11.2 GEOSPEC 3: 2017 Test 11.2</p> <p>GEOSPEC 3: 2001 Test 11.4 GEOSPEC 3: 2017 Test 11.4 Buildings Department PNAP 55 (1994) Cl. 2 App. A</p>
Soil (other)	<p>Pull-out test of soil nails</p> <p>Soil nail performance</p> <p>Time domain reflectometry (TDR) test on soil nails</p>	<p>Architectural Services Department General Specification for Building (2017) Section 26 Geotechnical Works on Soil and Rock Slopes Cl. 26.39</p> <p>Architectural Services Department General Specification for Building (2022) Section 26 Geotechnical Works on Soil and Rock Slopes Cl. 26.44</p> <p>Hong Kong Housing Authority Specification Library (2000) Cl. SLO.T310.3 to SLO.T350.3</p> <p>General Specification for Civil Engineering Works (2020) Vol. 1 Cl. 7.144</p> <p>GEOGUIDE 7 (2008) Cl. 6.3.2 GEOGUIDE 7 (2017) Cl. 6.3.2</p> <p>Architectural Services Department General Specification for Building (2017) Section 26 Geotechnical Works on Soil and Rock Slopes Cl. 26.42</p> <p>Architectural Services Department General Specification for Building (2022) Section 26 Geotechnical Works on Soil and Rock Slopes Cl. 26.47</p> <p>Geotechnical Engineering Office Guidelines on Test Procedure using Time Domain Reflectometry (TDR) to determine the length of installed soil nails (July 2007)</p>

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Structural fixings (anchor bolts, dowel bars & spiders)	Proof load test of spiders in the force range 1 kN – 100 kN Shear proof load test of anchor bolts in the force range 1 kN – 1000 kN Shear test of anchor bolts in the force range 1 kN -1000 kN Tensile proof load test of anchor bolts in the force range 1 kN – 1000 kN Tensile test of anchor bolts in the force range 1 kN – 1000 kN Tensile proof load test of anchor bolts (size M6 – M39) in the force range 1 kN – 150 kN Tensile proof load test of dowel bars (6 – 40 mm diameter) in the force range 1 kN – 1000 kN Tightening torque test of anchor bolts and bolt with nut in the torque range of 20 Nm – 500 Nm	Buildings Department Code of Practice for the Structural Use of Steel (2011) Cl. 16.2.1 Buildings Department APP-37 (May 2012) App. C BS 5080: Part 2: 1986 + Amd 7602 Cl. 7.1, 7.2.1 & 7.2.3 with modifications (by incremental loading) BS 5080: Part 2: 1986 + Amd 7602 Cl. 7.1, 7.2.1 & 7.2.3 (by incremental loading) BS 5080: Part 1: 1993 Cl. 6, 7.1.1 & 7.1.3 with modifications (by incremental loading) BS 5080: Part 1: 1993 Cl. 6, 7.1.1 & 7.1.3 (by incremental loading) In-house method DIA 08 In-house method DIA 33 (with one hour deformation measurement) In-house method DIA 09 In-house method DIA50
Underground Utility Survey	Pipe cable locating / Electromagnetic locating	Specifications for Nondestructive Testing, Surveying, Imaging and Diagnosis for Underground Utilities – 1.1 Pipe Cable Locating / Electromagnetic Locating (2019) published by Department of Land Surveying and Geo-Informatics (LSGI) of The Hong Kong Polytechnic University

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Welds (destructive)	Bend test on welds in metallic materials Charpy V-notch impact test on welds in metallic materials Fracture test on welds in metallic materials Longitudinal tensile test on welds in metallic materials in the force range 20 kN – 1500 kN Macroscopic examination on welds in metallic materials Transverse tensile test on welds in metallic materials in the force range 15 kN – 1500 kN Vickers hardness test across welded joints in the scale of HV 10	BS EN 910: 1996 BS EN 875: 1995 BS EN ISO 9016: 2011 BS EN 1320: 1997 BS EN 876: 1995 BS EN ISO 5178: 2011 BS EN 1321: 1997 + Amd. 14972 BS EN ISO 17639: 2022 BS EN 895: 1995 BS EN ISO 4136: 2011 BS EN 1043: Part 1: 1996