



AQuality TestConsult Limited

東恒測試顧問有限公司

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ACCREDITED TEST : Calibration Services 校正服務

CATEGORIES Construction Materials 建築材料

認可測試類別

AQuality TestConsult Limited

東恒測試顧問有限公司

No.11 A&B, Kai Fong Garden, Ping Che Road, Fanling, New Territories, Hong Kong
 香港新界粉嶺坪輦路啟芳園 11 號 A&B

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	Calibration in accordance with in-house method CON-L-011 for the dimensional requirements as specified in the following specifications: BS EN 12390-2: 2000 Cl. 3.3d Dimensions of ramming face: 25 mm x 25 mm Length: 380 mm	0.04 mm 0.57 mm
	Verification in accordance with in-house method CON-L-011 for the dimensional and mass requirements as specified in the following specifications: CS1: 2010: Vol. 1 App. A10 Dimensions of ramming face: 25 mm x 25 mm Length: not less than 380 mm Mass: 1.8 kg	0.04 mm 0.57 mm 4 g
- Cube mould	Verification in accordance with in-house method CON-L-003 for the dimensional requirements as specified in the following specifications: BS EN 12390-1: 2000 Cl. 5.2.4 Dimensions: 100 mm Flatness of the four side faces: not more than 0.03 mm (for new moulds) or 0.05 mm (for moulds in use) Flatness of the top surface of the baseplate: not more than 0.06 mm (for new moulds) or 0.1 mm (for moulds in use) Perpendicularity of the sides: not more than 0.5 mm	0.06 mm 0.01 mm 0.01 mm 0.01 mm
	Dimensions: 150 mm Flatness of the four side faces: not more than 0.045 mm (for new moulds) or 0.075 mm (for moulds in use) Flatness of the top surface of the baseplate: not more than 0.09 mm (for new moulds) or 0.15 mm (for moulds in use) Perpendicularity of the sides: not more than 0.5 mm	0.06 mm 0.01 mm 0.01 mm 0.01 mm
	CS1: 2010: Vol. 1 App. A25 Dimensions: 100 mm or 150 mm Flatness: not more than 0.03 mm or 0.06 mm Perpendicularity: not more than 0.5 mm Parallelism: not more than 1.0 mm	0.06 mm 0.01 mm 0.01 mm 0.06 mm

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* The calibration uncertainty of a device under test, which is usually reported at 95% confidence level, depends on both the CMC of the laboratory and the performance of the device during calibration.

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Construction materials testing equipment (Cont'd) - Curing tank	On-site verification in accordance with in-house methods CON-L-001a and CON-L-002 for the parameters as specified in CS1: 2010: Vol. 1 App. A28 Temperature distribution at a range of (27 ± 3) °C Efficiency of circulation	0.5 °C 30 s
- Drying oven	On-site calibration of temperature setting and temperature variation in accordance with in-house method SRT-L-002a over the following range : Temperature: 45 °C to 150 °C	1.5 °C
- Slump cone	Verification in accordance with in-house method CON-L-009 for the dimensional requirements as specified in BS EN 12350-2: 2009 Cl. 4.1, or CS1: 2010: Vol. 1 App. A5 the following specifications: Diameter of top: 100 mm Diameter of base: 200 mm Height: 300 mm Thickness: not less than 1.5 mm	0.45 mm 0.50 mm 0.57 mm 0.15 mm
- Tamping rod	Verification in accordance with in-house method CON-L-009 for the dimensional requirements as specified in BS EN 12350-2: 2009 Cl. 4.2, or CS1: 2010: Vol. 1 App. A6 Diameter of rod: 16 mm Length of rod: 600 mm	0.04 mm 0.57 mm

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Electrical measurements - Time and frequency measuring instruments - Stop watch	Calibration for time in accordance with in-house method GEN-L-005 (Method 2) over the following range : 1 s to 3600 s	0.6 s

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Length and related measurements - Calliper	Calibration for length in accordance with in-house method GEN-L-002 over the following ranges : External measurement: 0 mm to 300 mm Internal measurement: 10 mm to 300 mm	0.04 mm 0.04 mm
- Engineer's steel measuring rule	Calibration for length in accordance with in-house method GEN-L-007 over the following range : 0 mm to 1000 mm	0.4 mm

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Mass and related measurements - Balance	Calibration for mass in accordance with in-house method GEN-L-003 using OIML Class E2 / F1 weights from 1 g to 50 kg over the following ranges : 1 g to 220 g above 220 g to 5 kg above 5 kg to 30 kg above 30 kg to 50 kg	0.0008 g 0.06 g 2.9 g 9.4 g
- Weight	Calibration for mass in accordance with in-house method GEN-L-004 for the following weights : 1 g 2 g 5 g 10 g 20 g 50 g 100 g 200 g 500 g 1 kg 2 kg 5 kg 10 kg 20 kg	0.0007 g 0.0007 g 0.0007 g 0.0007 g 0.0007 g 0.0007 g 0.0011 g 0.0007 g 0.08 g 0.08 g 0.08 g 0.08 g 4.16 g 4.16 g
- Weight (non-standard weight)	Calibration for mass in accordance with in-house method GEN-L-004 over the following ranges : 1 g to 200 g above 200 g to 5 kg above 5 kg to 30 kg above 30 kg to 50 kg	0.0007 g 0.0007 g to 0.08 g 0.08 g to 4.16 g 4.16 g to 8.21 g

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Temperature measurements - Digital thermometer	Calibration for temperature using water bath as the medium in accordance with in-house method GEN-L-001 over the following range : 15 °C to 55 °C	0.4 °C
- Temperature recorder with sensor	Calibration for temperature using water bath as the medium in accordance with in-house method GEN-L-001 over the following range : 15 °C to 55 °C	0.4 °C

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Adhesive	Pull-off test of render Pull-off test of mortar Pull-off test of tiles Pull-off test of tile adhesive	In-house method TIL-P-004 (Saw cutting method or coring method) Hong Kong Housing Authority Materials Testing Services (2020/2022) Specification Part D Cl. 2.1.15 (Method 1) In-house method TIL-P-005 (Saw cutting method or coring method) In-house method TIL-P-001 (Saw cutting method or coring method) In-house method TIL-P-002 (Saw cutting method or coring method)

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Admixture (Chemical analysis)	Ash content	BS 5075: Part 1: 1982 App. D2 + Amd. 4910
	Dry material content	BS 5075: Part 1: 1982 App. D1 + Amd. 4910
	Conventional dry material content	BS EN 480: Part 8 : 1997 BS EN 934: Part 1: 2008 Cl. 4 & BS EN 934: Part 2 : 2009 Cl. 4.1 & BS EN 480: Part 8 : 2012
	pH value of liquid admixtures	In-house method ADX-C-005 BS EN 934: Part 1: 2008 Cl. 4 & BS EN 934: Part 2: 2009 Cl. 4.1 & ISO 4316: 1977
	Relative density of liquid admixtures	BS 5075: Part 1: 1982 App. D3 + Amd. 4910
	Density of liquid admixtures	ISO 758: 1976
	Chloride ion content	BS 5075: Part 1: 1982 App. E + Amd. 4910
	Water-soluble chloride content	BS EN 480: Part 10: 1997 BS EN 934: Part 1: 2008 Cl. 4 & BS EN 934: Part 2: 2009 Cl. 4.1 & BS EN 480: Part 10: 2009
	Sodium oxide content	BS EN 480: Part 12: 1998 BS EN 480: Part 12: 2005 In-house method ADX-C-006
	Potassium oxide content	BS EN 480: Part 12: 1998 BS EN 480: Part 12: 2005 In-house method ADX-C-006
	Alkali content (Na ₂ O equivalent)	In-house method ADX-C-006 BS EN 480: Part 12: 1998 BS EN 934: Part 1: 2008 Cl. 4 & BS EN 934: Part 2: 2009 Cl. 4.1 & BS EN 480: Part 12: 2005

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Admixture (Chemical analysis)	Conventional dry material content	BS EN 934: Part 2 : 2009+A1: 2012 Cl. 4.1 & BS EN 934: Part 1: 2008 Cl. 4 Table 1 <i>Test procedure for compliance testing</i> BS EN 480: Part 8 : 2012
	pH value of liquid admixtures	BS EN 934: Part 2 : 2009+A1: 2012 Cl. 4.1 & BS EN 934: Part 1: 2008 Cl. 4 Table 1 <i>Test procedure for compliance testing</i> ISO 4316: 1977
	Density of liquid admixtures	BS EN 934: Part 2 : 2009+A1: 2012 Cl. 4.1 & BS EN 934: Part 1: 2008 Cl. 4 Table 1 <i>Test procedure for compliance testing</i> ISO 758: 1976
	Water-soluble chloride content	BS EN 934: Part 2 : 2009+A1: 2012 Cl. 4.1 & BS EN 934: Part 1: 2008 Cl. 4 Table 1 <i>Test procedure for compliance testing</i> BS EN 480: Part 10: 2009
	Alkali content (Na ₂ O equivalent)	BS EN 934: Part 2 : 2009+A1: 2012 Cl. 4.1 & BS EN 934: Part 1: 2008 Cl. 4 Table 1 <i>Test procedure for compliance testing</i> BS EN 480: Part 12: 2005

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Aggregates	Sampling	BS 812: Part 102: 1989 CS3: 2013 Section 8
	Particle size distribution	BS 812: Section 103.1: 1985 + Amd. 6003 (by sieve analysis) CS3: 2013 Section 10 + Amd. 1/2013
	Flakiness index	BS 812: Section 105.1: 1989 CS3: 2013 Section 11
	Elongation index	BS 812: Section 105.2: 1990 CS3: 2013 Section 12
	Methylene blue value	CS3: 2013 Section 13
	Los Angeles value	CS3: 2013 Section 14
	Aggregate impact value	BS 812: Part 112: 1990 + Amd. 8772 CS3: 2013 Section 15
	Ten per cent fines value	BS 812: Part 111: 1990 CS3: 2013 Section 16
	Particle density and water absorption	BS 812: Part 2: 1995 + Amd. 9195 & 10379 CS3: 2013 Section 17
	Moisture content	BS 812: Part 109 : 1990 (by oven drying method) CS3: 2013 Section 18
	Soundness	BS 812: Part 121: 1989 CS3: 2013 Section 19
	Drying shrinkage	CS3: 2013 Section 20
	Effect of organic substances by mortar method	CS3: 2013 Section 22
	Alkali silica reaction potential by ultra-accelerated mortar-bar test	CS1: 2010 Section 22
	Aggregate crushing value	BS 812: Part 110: 1990
Bulk density, voids and bulking	BS 812: Part 2: 1995	

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Aggregates (cont'd)	Clay, silt and dust content	BS 812: Part 1: 1975 + Amd. 4875 (by decantation method)
	Compacting fraction value of aggregates for granular bed	Hong Kong Housing Authority Specification Library (2022) DRA2.T250.9 - DRA2.T280.9 General Specification for Civil Engineering Works (2006) Vol. 1 App. 5.2
	Shell content in coarse aggregates	BS 812: Part 106: 1985
Aggregates (Chemical analysis)	Water-soluble chloride salts	BS 812: Part 117: 1988 BS EN 1744: Part 1: 1998 Cl. 7 <Excluding Cl.7.2> BS EN 1744: Part 1: 2009+A1: 2012 Cl. 7 <Excluding Cl.7.2>
	Water-soluble sulphate content	BS 812 Part 118: 1988 <Excluding Cl. 4, 5.3, 5.5.2.1>
	Total sulphate content	BS 812 Part 118: 1988 <Excluding Cl. 4>
	Acid-soluble materials	BS 812 Part 119: 1985 <Excluding Cl. 4>
	Water-soluble chloride ion content	CS3: 2013 Section 21.3
	Acid-soluble chloride ion content	CS3: 2013 Section 21.4
	Acid-soluble sulphate content	CS3: 2013 Section 21.5
	Total sulphur content	CS3: 2013 Section 21.6
	Presence of humus	CS3: 2013 Section 21.7

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Cement (Chemical analysis)	Loss-on-ignition	BS EN 196-2: 2005 Cl. 7 BS EN 197-1: 2011 Cl. 7.3 & BS EN 196-2: 2013 Cl. 4.4.1
	Sulphate content (as SO ₃)	BS EN 196-2: 2005 Cl. 8 BS EN 197-1: 2011 Cl. 7.3 & BS EN 196-2: 2013 Cl. 4.4.2
	Residue insoluble in hydrochloric acid and sodium carbonate	BS EN 196-2: 2005 Cl. 9 BS EN 197-1: 2011 Cl. 7.3 & BS EN 196-2: 2013 Cl. 4.4.3
	Manganese content (Mn) Manganese oxide content (MnO) Manganese trioxide content (Mn ₂ O ₃)	BS EN 196-2: 2005 Cl. 12 BS EN 196-2: 2013 Cl. 4.4.6
	Impure silica content (SiO ₂)	BS EN 196-2: 2005 Cl. 13.2, 13.4 BS EN 196-2: 2013 Cl. 4.5.2, 4.5.4
	Pure silica content (SiO ₂)	BS EN 196-2: 2005 Cl. 13.6 BS EN 196-2: 2013 Cl. 4.5.6
	Soluble silica content (SiO ₂)	BS EN 196-2: 2005 Cl. 13.8 BS EN 196-2: 2013 Cl. 4.5.8
	Total silica content (SiO ₂)	BS EN 196-2: 2005 Cl. 13.9 BS EN 196-2: 2013 Cl. 4.5.9
	Iron (III) oxide content	BS EN 196-2: 2005 Cl. 13.10 BS EN 196-2: 2013 Cl. 4.5.10
	Aluminium oxide content	BS EN 196-2: 2005 Cl. 13.11 BS EN 196-2: 2013 Cl. 4.5.11
	Calcium oxide content	BS EN 196-2: 2005 Cl. 13.14 (Alternative method) BS EN 196-2: 2013 Cl. 4.5.14 (Alternative method)
	Magnesium oxide content	BS EN 196-2: 2005 Cl. 13.15 (Alternative method) BS EN 196-2: 2013 Cl. 4.5.15 (Alternative method)
	Sodium oxide content	BS EN 196-2: 2005 Cl. 17 BS EN 196-2: 2013 Cl. 4.5.19



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Cement (Chemical analysis) (cont'd)	Potassium oxide content Alkali content (sodium oxide equivalent) Chloride ion content (Cl ⁻) Heat of hydration	BS EN 196-2: 2005 Cl. 17 BS EN 196-2: 2013 Cl. 4.5.19 BS EN 196-2: 2005 Cl. 17 BS EN 196-2: 2013 Cl. 4.5.19 BS EN 196-2: 2005 Cl. 14 BS EN 197-1: 2011 Cl. 7.3 & BS EN 196-2: 2013 Cl. 4.5.16 BS 4550: Part 3: Section 3.8: 1978 (with modification)

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Cement & Portland pulverized fuel ash cement (PPFAC)	Compressive strength of broken mortar prism in the force range 1 kN - 250 kN Density Fineness Flexural strength of mortar prisms in the force range 1 kN – 15 kN Setting times Soundness Standard consistence	BS EN 196-1: 2005 BS EN 196-1: 2016 BS EN 196-6: 1992 Annex NC BS EN 196-6: 2010 Annex NC BS EN 196-6: 1992 Cl.4 (by Blaine method) BS EN 196-6: 2010 Cl.4 (by Blaine method) BS EN 196-1: 2005 BS EN 196-1: 2016 BS EN 196-3: 2005 + A1: 2008 Cl. 6 BS EN 196-3: 2016 Cl. 6 BS EN 196-3: 2005 + A1: 2008 Cl. 7 BS EN 196-3: 2016 Cl. 7 BS EN 196-3: 2005 + A1: 2008 Cl. 5 BS EN 196-3: 2016 Cl. 5
Concrete	Sampling of fresh concrete Slump of fresh concrete Compaction factor of fresh concrete Flow table test Stiffening time of fresh concrete Density of compacted fresh concrete Air content of fresh concrete Making test cube from fresh concrete	BS EN 12350-1: 2009 CS1: 2010 Section 1 BS EN 12350-2: 2009 CS1: 2010 Section 2 Part I CS1: 2010 Section 2 Part II BS EN 12350-5: 2009 CS1: 2010 Section 2 Part IV CS1: 2010 Section 3 CS1: 2010 Section 5 BS EN 12350-7: 2009 CS1: 2010 Section 6 BS EN 12390-2: 2000 + Amd. 14343 CS1: 2010 Section 7

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Concrete (cont'd)	Making test beams from fresh concrete	CS1: 2010 Section 8
	Making test cylinders from fresh concrete	CS1: 2010 Section 9
	Curing of test specimens	BS EN 12390-2: 2000 + Amd. 14343 CS1: 2010 Section 10
	Mixing and sampling of fresh concrete	CS1: 2010 Section 11
	Compressive strength of concrete cubes in the force range 20 kN - 3000 kN	BS EN 12390-3: 2009 CS1: 2010 Section 12
	Flexural strength of concrete test beams	CS1: 2010 Section 14
	Obtaining core samples	CS1: 2010 Section 15
	Compressive strength of concrete cores in the force range 20 kN - 3000 kN	CS1: 2010 Section 15
	Density of hardened concrete	BS EN 12390-7: 2009 CS1: 2010 Section 16
	Removal of concrete cover to expose reinforcement	Hong Kong Housing Authority Materials Testing Services (2020/2022) for Maintenance & Building Materials Specification Part D Cl. 4.2.1
	Temperature monitoring of fresh concrete	In-house method CON-P-019
	Water absorption	BS 1881: Part 122: 1983 BS 1881: Part 122: 2011 + A1: 2020



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Concrete (Chemical analysis)	Chloride content Calcium oxide content Cement content Aggregate content Sulphate content	CS1: 2010 Section 21.10.2 CS1: 2010 Section 21.6 CS1: 2010 Section 21.6.6 CS1: 2010 Section 21.6.7 CS1: 2010 Section 21.10.3

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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	SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED 規範、標準方法或應用技術
Concrete (diagnostic)	Carbonation test Covermeter survey Half-cell potential measurement Surface hardness measurement Ultrasonic pulse velocity measurement	Building Research Establishment Information Paper IP 6/81 BS EN 14630: 2006 Hong Kong Housing Authority Materials Testing Services (2020/2022) for Maintenance & Building Materials Specification Part D Cl. 4.3.1 (Method 1 & Method 2) BS 1881: Part 204: 1988 ASTM C876-87 ASTM C876-15 BS EN 12504-2: 2012 BS EN 12504-2: 2021 BS EN 12504-4: 2004 (direct & semi-direct transmission) BS EN 12504-4: 2021 (direct & semi-direct transmission)
Curtain walls & cladding (spiders)	Proof load test of spiders in the force range 1 kN – 120 kN	Buildings Department Code of Practice for the Structural Use of Steel (2011) Cl. 16.2.1

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Grout	Compressive strength of grout cubes in the force range 20 kN to 3000 kN Flow of grout for pre-placed aggregate concrete (flow cone method) Expansion and bleeding of freshly mixed grouts for preplaced-aggregates concrete Bleeding and free expansion Bleeding and volume change (wick-induced test) Fluidity test (cone method)	BS EN 12390-3: 2009 CS1: 2010 Section 12 ASTM C939-02 ASTM C939-10 ASTM C940-98a ASTM C940-10a General Specification for Civil Engineering Works (2006) Vol. 2 Cl. 17.60 BS EN 445: 2007 Cl. 4.5 General Specification for Civil Engineering Works (2020) Vol. 2 Cl. 17.60 BS EN 445: 2007 Cl. 4.3.1 General Specification for Civil Engineering Works (2020) Vol. 2 Cl. 17.66
Ground Granulated Blastfurnace Slag (GGBS)	Activity index Density Fineness Initial setting time Moisture content	BS EN 196-1: 2005 BS EN 196-1: 2016 in conjunction with the following specification: BS EN 15167-1: 2006 Cl. 5.3.2.3 BS EN 196-6: 2010 Annex NC in conjunction with the following specification: BS EN 15167-1: 2006 Cl. 5.5g BS EN 196-6: 2010 (by Blaine method) in conjunction with the following specification: BS EN 15167-1: 2006 Cl. 5.3.1 BS EN 196-3: 2005 + A1: 2008 BS EN 196-3: 2016 in conjunction with the following specification: BS EN 15167-1: 2006 Cl. 5.3.2.2 BS EN 15167-1: 2006 Annex A

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Ground Granulated Blastfurnace Slag (GGBS) (Chemical analysis)	Loss-on-ignition	BS EN 196-2: 2005 Cl. 7 BS EN 15167-1: 2006 (Amd16763) Cl. 5.2 & BS EN 196-2: 2013 Cl. 4.4.1
	Sulphate content (as SO ₃)	BS EN 196-2: 2005 Cl. 8 BS EN 15167-1:2006 (Amd16763) Cl. 5.2 & BS EN 196-2: 2013 Cl. 4.4.2
	Insoluble residue in hydrochloric acid and sodium carbonate	BS EN 196-2: 2005 Cl. 9 BS EN 196-2: 2013 Cl. 4.4.3
	Manganese content (Mn) Manganese oxide content (MnO) Manganese trioxide content (Mn ₂ O ₃)	BS EN 196-2: 2005 Cl. 12 BS EN 15167-1: 2006 (Amd16763) Cl. 5.5 & BS EN 196-2: 2013 Cl. 4.4.6
	Impure silica content (SiO ₂)	BS EN 196-2: 2005 Cl. 13.2, 13.4 BS EN 196-2: 2013 Cl. 4.5.2, 4.5.4
	Pure silica content (SiO ₂)	BS EN 196-2: 2005 Cl. 13.6 BS EN 196-2: 2013 Cl. 4.5.6
	Soluble silica content (SiO ₂)	BS EN 196-2: 2005 Cl. 13.8 BS EN 196-2: 2013 Cl. 4.5.8
	Total silica content (SiO ₂)	BS EN 196-2: 2005 Cl. 13.9 BS EN 15167-1: 2006 (Amd16763) Cl. 5.5 & BS EN 196-2: 2013 Cl. 4.5.9
	Iron (III) oxide content	BS EN 196-2: 2005 Cl. 13.10 BS EN 196-2: 2013 Cl. 4.5.10
	Aluminium oxide content	BS EN 196-2: 2005 Cl. 13.11 BS EN 15167-1: 2006 (Amd16763) Cl. 5.5 & BS EN 196-2: 2013 Cl. 4.5.11
	Calcium oxide content	BS EN 196-2: 2005 Cl. 13.14 (Alternative method) BS EN 15167-1: 2006 (Amd16763) Cl. 5.5 & BS EN 196-2: 2013 Cl. 4.5.14 (Alternative method)
	Magnesium oxide content	BS EN 196-2: 2005 Cl. 13.15 (Alternative method) BS EN 15167-1: 2006 (Amd16763) Cl. 5.2 & BS EN 196-2: 2013 Cl. 4.5.15 (Alternative method)

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Ground Granulated Blastfurnace Slag (GGBS) (Chemical analysis) (cont'd)	Sodium oxide content	BS EN 196-2: 2005 Cl. 17 BS EN 196-2: 2013 Cl. 4.5.19
	Potassium oxide content	BS EN 196-2: 2005 Cl. 17 BS EN 196-2: 2013 Cl. 4.5.19
	Alkali content (sodium oxide equivalent)	BS EN 196-2: 2005 Cl. 17 (Reference method) BS EN 15167-1: 2006 (Amd16763) Cl. 5.5 & BS EN 196-2: 2013 Cl. 4.5.19 (Reference method)
	Chloride ion content (Cl ⁻)	BS EN 196-2: 2005 Cl. 14 BS EN 15167-1: 2006 (Amd16763) Cl. 5.2 & BS EN 196-2: 2013 Cl. 4.5.16
	Sulphide content	BS EN 196-2: 2005 Cl. 11 BS EN 15167-1: 2006 (Amd16763) Cl. 5.2 & BS EN 196-2: 2013 Cl. 4.4.5
Groundwater (Chemical analysis)	Sulphate content (as SO ₃)	GEOSPEC 3: 2001 Test 9.3 GEOSPEC 3: 2017 Test 9.3
	pH value	GEOSPEC 3: 2001 Test 9.5 GEOSPEC 3: 2017 Test 9.5

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Manhole covers / steps	Loading test of manhole covers and gully gratings Mass determination and loading test of manhole covers, gully gratings and kerb overflow weirs Mass determination and resistance to fracture of manhole covers, gully gratings and kerb overflow weirs	BS EN 124-1: 2015 Cl. 8 Hong Kong Housing Authority Specification Library (2022) DRA2.M650.9 & DRA2.T430.9 to DRA2.T490.9 General Specification for Civil Engineering Works (2006) Vol. 1 Cl. 5.95 & App. 5.3 General Specification for Civil Engineering Works (2020) Vol. 1 Cl. 5.95 & App. 5.3
Metallic materials	Bend test of metallic materials Bend test of reinforcing bar, wire rods, welded fabric, cold reduced wire for reinforcement of concrete Bend test of welded fabric for reinforcement of concrete Bond property of steel reinforcing bars by surface geometry measurement	BS EN ISO 7438: 2016 excluding Cl. 4.3 & 4.4 in conjunction with the following specification(s): BS EN 485-1: 2008 Cl 6.4 & BS EN 485-2: 2008 Cl. 4.1 BS EN ISO 15630-1: 2002 Cl. 6 BS EN ISO 15630-1: 2010 Cl. 6 BS EN ISO 15630-1: 2019 Cl. 6 BS EN ISO 15630-2: 2010 Cl. 6 BS EN ISO 15630-2: 2019 Cl. 6 BS EN ISO 15630-1: 2002 Cl. 10, 11.2 & 11.3 BS EN ISO 15630-1: 2010 Cl. 10, 11.2 & 11.3 BS EN ISO 15630-1: 2019 Cl. 10, 11.2 & 11.3 CS2: 2012 (Rev. 5) Cl. 6.1 & 6.7 excluding Cl. 6.7.3 in conjunction with the following specification(s): BS 4449: 2005 + A2: 2009 + A3: 2016 Cl. 7.4 & 9

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Metallic materials (cont'd)	Charpy V-notch impact test	BS EN 10045-1: 1990 BS EN ISO 148-1: 2016 in conjunction with the following specification(s): BS EN 10021: 2006 Cl. 8.3.4.2 BS EN 10025-1: 2004 Cl.10.2.2 BS EN 10025-2: 2004 Cl.10.2 & Table 9 BS EN 10025-2: 2019 Cl. 10.2.2 & Table 8 BS EN 10025-3: 2004 Cl.10.2, Table 6 & 7 BS EN 10025-3: 2019 Cl. 10.2.2, Table 5 & 6 BS EN 10025-4: 2004 Cl.10.2, Table 6 & 7 BS EN 10025-4: 2019 Cl.10.2.2, Table 5 & 6 BS EN 10025-5: 2004 Cl.10.2 & Table 5 BS EN 10025-5: 2019 Cl. 10.2.2 & Table 5 BS EN 10025-6: 2004 + A1: 2009 Cl. 10.2, Table 6 & 7 BS EN 10025-6: 2019 Cl. 10.2.2 & Table 5 & 6 BS EN 10088-2: 2005 Cl. 7.4.4, Table 8, 10 & 11 BS EN 10088-2: 2014 Cl. 7.4.4, Table 7, 8, 10 BS EN 10088-3: 2005 Cl. 7.4.4, Table 9 to 12 & 14 - 17 BS EN 10088-3: 2014 Cl. 7.4.4, Table 8, 9, 11 to 14, 16 & 17 BS EN 10210-1: 2006 Cl. 6.6.2, 9.2.3, Table A.3 & B.3 BS EN 10219-1: 2006 Cl. 6.7.2, 9.2.3, Table A.3, B.4 & B.5 BS EN 1563: 2018 Cl. 9.2 & Table 2 BS EN ISO 898-1: 2013 Cl. 9.14.5 & Table 3 ISO 898-1: 2009 Cl. 9.14.5 & Table 3
	Mass per metre of cold reduced steel wires	BS 4482: 2005 Cl. 7.3, 9 & BS EN ISO 15630-1: 2002 Cl. 12
	Mass per meter of steel reinforcing bars, wire rods and wire	BS EN ISO 15630-1: 2002 Cl. 12 BS EN ISO 15630-1: 2010 Cl. 12 BS EN ISO 15630-1: 2019 Cl. 12 CS2: 2012 (Rev. 5) Cl. 6.1 & 6.2 in conjunction with the following specification(s): BS 4449: 2005 + A2: 2009 + A3: 2016 Cl. 7.2.2, 7.3 & 9
	Mass per metre square, pitch and dimension of steel fabrics for reinforcement of concrete	BS 4483: 2005 Cl. 7.3, 8.1.3.2 with BS 4449: 2005 Cl. 7.3 & BS EN ISO 15630-1: 2002 Cl. 12

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Metallic materials (cont'd)	Proof load test of unmachined (finished) bolts screws and studs in the force range 3 kN – 2000 kN	BS EN ISO 898-1: 2009 Cl. 9.6 BS EN ISO 898-1: 2013 Cl. 9.6 in conjunction with the following specification(s): BS 3692: 2001 Cl. 11 & 13 BS 3692: 2014 Cl. 14 & 21 BS 4190: 2001 Cl. 15 & 20 BS 4190: 2014 Cl. 15 & 21
	Proof load test of steel nuts in the force range 3 kN – 2000 kN	BS 3692: 2001 Annex C.1 BS 3692: 2014 Annex C.1 BS 4190: 2001 Annex A.1 BS 4190: 2014 Annex A.1 BS EN ISO 898-2: 2012 Cl. 9.1
	Proof load test of stainless steel nut in the force range 3 kN – 2000 kN	BS EN ISO 898-2: 2012 Cl. 9.1 BS EN ISO 898-2: 2022 Cl. 10.1 in conjunction with the following specification(s): BS EN ISO 3506-2: 2009 Cl. 6 BS EN ISO 3506-2: 2020 Cl. 10.1
	Rebend test of reinforcing bars, wire rod, welded fabric, cold reduced wire for reinforcement of concrete	BS EN ISO 15630-1: 2002 Cl. 7 BS EN ISO 15630-1: 2010 Cl. 7 BS EN ISO 15630-1: 2019 Cl. 7 CS2: 2012 (Rev. 5) Cl. 6.1 & 6.5 in conjunction with the following specification(s): BS 4449: 2005 + A2: 2009 + A3: 2016 Cl. 7.2.5 BS 4482: 2005 Cl. 7.2.4 & 9 BS 4483: 2005 Cl. 7.2.5 & 8.1.3.2

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Metallic materials (cont'd)	<p>Tensile test of unmachined (finished) bolts, screws and studs in the force range 3 kN – 2000 kN</p> <p>Tensile test of machined bolts, screws and studs in the force range 3 kN – 2000 kN</p>	<p>BS EN ISO 6892-1: 2009 Cl. 10.4 Method B BS EN ISO 6892-1: 2016 Cl. 10.3.3 Method B BS EN ISO 6892-1: 2019 Cl. 10.3.3 Method B in conjunction with the following specification(s): BS 3692: 2001 Cl. 11 & 13 BS 3692: 2014 Cl. 14 & 21 BS 4190: 2001 Cl. 15 & 20 BS 4190: 2014 Cl. 15 & 21 BS EN ISO 898-1: 2009 Cl. 9.2 BS EN ISO 898-1: 2013 Cl. 9.2</p> <p>BS EN ISO 6892-1: 2009 Cl. 10.4 Method B BS EN ISO 6892-1: 2016 Cl. 10.3.3 Method B BS EN ISO 6892-1: 2019 Cl. 10.3.3 Method B in conjunction with the following specification(s): BS 3692: 2001 Cl. 11 & 13 BS 3692: 2014 Cl. 14 & 21 BS 4190: 2001 Cl. 15 & 20 BS 4190: 2014 Cl. 15 BS EN ISO 898-1: 2009 Cl. 9.7 BS EN ISO 898-1: 2013 Cl. 9.7</p>

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Metallic materials (cont'd)	<p>Tensile test of reinforcing bars, wire rod, welded fabric, cold reduced wire for reinforcement of concrete in the force range 3 kN - 2000 kN</p> <p>Tensile test & slip/permanent elongation test of mechanical coupler for reinforcing bar in the force range 3 kN – 2000 kN</p>	<p>BS EN 10002-1: 2001 BS EN ISO 6892-1: 2009 Cl. 10.4 Method B BS EN ISO 6892-1: 2016 Cl. 10.3.3 Method B BS EN ISO 6892-1: 2019 Cl. 10.3.3 Method B in conjunction with the following specification(s): BS 4482: 2005 Cl. 8.1.3.1 & 9 BS 4483: 2005 Cl. 7.2.2 & 7.2.3, 8.1.3.1 & 9 BS 4449: 2005 + A2: 2009 + A3: 2016 Cl. 7.2.2, 7.2.3, 8.1.3.1 & 9 BS EN ISO 15630-1: 2002 Cl. 5 BS EN ISO 15630-1: 2010 Cl. 5 BS EN ISO 15630-1: 2019 Cl. 5 BS EN ISO 15630-2: 2010 Cl. 5 BS EN ISO 15630-2: 2019 Cl. 5 CS2: 2012 (Rev. 5) Cl. 6.1 & 6.4</p> <p>In-house method STL-P-008 in conjunction with the following specification(s): BS 8110: Part 1: 1997 Cl. 3.12.8.16.2 General Specification for Civil Engineering Works (2006) Vol. 2 Cl. 15.35 Buildings Department Code of Practice for Structural Use of Concrete (2013) Cl. 3.2.8.3</p>

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Metallic materials (cont'd)	Tensile test of metallic materials in the force range 3 kN – 2000 kN	BS EN 10002-1: 2001 BS EN ISO 6892-1: 2009 Cl. 10.4 Method B BS EN ISO 6892-1: 2016 Cl. 10.3.3 Method B BS EN ISO 6892-1: 2019 Cl. 10.3.3 Method B in conjunction with the following specification(s): BS EN 485-1: 2008 Cl. 6.3 & BS EN 485-2: 2008 Cl. 4.1 BS EN 1561: 1997 Cl. 9.1 & Table 1 BS EN 1561: 2011 Cl. 9.1 & Table 1 BS EN 1562: 1997 Cl. 9.1, Table 1 & 2 BS EN 1562: 2019 Cl. 9.1, Table 1, 2 & 3 BS EN 1563: 1997 Cl. 9.1, Table 1 & 3 BS EN 1563: 2018 Cl. 9.1, Table 1 & 3 BS EN 10025-1: 2004 Cl. 9.2.3.2 & 10.2.1 BS EN 10025-2: 2004 Cl. 10.2 & Table 7 & 8 BS EN 10025-2: 2019 Cl. 10.2.1 & Table 6 & 7 BS EN 10025-3: 2004 Cl. 10.2 & Table 5 BS EN 10025-3: 2019 Cl. 10.2.1 & Table 4 BS EN 10025-4: 2004 Cl. 10.2 & Table 5 BS EN 10025-4: 2019 Cl. 10.2.1 & Table 4 BS EN 10025-5: 2004 Cl. 10.2 & Table 4 BS EN 10025-5: 2019 Cl. 10.2.1 & 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 10088-2: 2014 Cl. 7.4.2, Table 7 - 18 BS EN 10088-3: 2005 Cl. 7.4.2, Table 8 - 17 BS EN 10088-3: 2014 Cl. 7.4.2, Table 8 - 17 & 19 - 25 BS EN 10164: 2004 Cl. 5.1 & 8.1 BS EN 10164: 2018 Cl. 6 & 9.1 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 BS EN 10248-1: 1996 Cl. 8.4.3 & 8.4.4 BS EN 10255: 2004 + A1: 2007 Cl. 9.3 & Table 1

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Metallic materials (cont'd)	<p>Vickers hardness test of metal in scale range of HV5, HV10 and HV30</p> <p>Weld shear force test of welded fabrics for reinforcement of concrete in the force range 3 kN – 2000 kN</p>	<p>BS 427: 1990 Section 2 BS EN 23878: 1993 BS EN ISO 6507-1: 2005 BS EN ISO 6507-1: 2018 in conjunction with the following specification(s): BS 3692: 2001 CI C.4.3 & Table 9 BS 3692: 2014 CI C.4.4 & Table 10 BS 4190: 2001 CI A.2.4 & Table 14 BS 4190: 2014 CI A.4.4 & Table 14 BS EN 10088-2: 2005 CI 7.4.5 & Table 8 BS EN 10088-2: 2014 CI 7.4.5 & Table 10 BS EN ISO 898-1: 1999 CI 8.4.1 & Table 3 BS EN ISO 898-1: 2009 CI 9.9.3(a) & Table 3 BS EN ISO 898-1: 2013 CI 9.9.3(a) & Table 3 BS EN ISO 898-2: 2012 CI 9.2.2 & Table 6 BS EN ISO 898-2: 2022 CI. 10.2.3 & Table 7 & 8 BS EN ISO 3506-1: 2009 CI 7.2.7 & Table 3 BS EN ISO 3506-1: 2020 CI. 9.6 & Table 3</p> <p>BS EN ISO 15630-2: 2010 Cl. 7 BS EN ISO 15630-2: 2019 Cl. 7.1 in conjunction with the following specification(s): BS 4483: 2005 Cl. 7.2.2 & 7.2.4</p>

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<p>Metallic materials (chemical analysis)</p> <p>- Carbon steel 250, 500 B, 500C</p> <p>- Stainless steel 316, 316L, 316H</p>	<p>Elemental Composition :-</p> <ul style="list-style-type: none"> - Carbon - Chromium - Copper - Molybdenum - Manganese - Nitrogen - Nickel - Sulphur - Phosphorus - Vanadium <p>Carbon equivalent value</p> <ul style="list-style-type: none"> - Carbon - Chromium - Molybdenum - Manganese - Nitrogen - Nickel - Sulphur - Phosphorus - Silicon 	<p>In-house method STL-C-001 (Spark OES)</p> <p>CS2:2012 Cl. 1.5.1</p> <p>In-house method STL-C-001 (Spark OES)</p>
<p>Mortar</p>	<p>Compressive strength of mortar cubes in the force range 20 kN to 3000 kN</p>	<p>BS EN 12390: Part 3: 2009 CS1: 2010 Section 12</p>

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Pulverized fuel ash (PFA)	Activity index	BS EN 196-1: 2005 BS EN 196-1: 2016 in conjunction with the following specification(s): BS EN 450-1: 2005 + A1: 2007 Cl. 5.3.2 BS EN 450-1: 2012 Cl. 5.3.2
	Particle density	BS EN 196-6: 1992 Annex NC BS EN 196-6: 2010 Annex NC BS EN 1097-7: 2008 in conjunction with the following specification(s): BS 3892: Part 1: 1997 Cl. 7 BS EN 450-1: 2005 + A1: 2007 Cl. 5.3.4 BS EN 450-1: 2012 Cl. 5.3.4
	Fineness	BS 3892: Part 1: 1997 Annex D BS EN 451-2: 1995 BS EN 451-2: 2017
	Initial setting time	BS EN 196-3: 1995 BS EN 196-3: 2005 + A1: 2008 BS EN 196-3: 2016 in conjunction with the following specification(s): BS 3892: Part 1: 1997 Cl. 10 BS EN 450-1: 2005 + A1: 2007 Cl. 5.3.5 BS EN 450-1: 2012 Cl. 5.3.5
	Moisture content	BS 3892: Part 1: 1997 Annex C
	Soundness	BS EN 196-3: 1995 BS EN 196-3: 2005 + A1: 2008 BS EN 196-3: 2016 in conjunction with the following specification(s): BS 3892: Part 1: 1997 Cl. 11 BS EN 450-1: 2005 + A1: 2007 Cl. 5.3.3 BS EN 450-1: 2012 Cl. 5.3.5
	Strength factor	BS 3892: Part 1: 1997 Annex F
	Water requirement	BS 3892: Part 1: 1997 Annex E BS EN 450-1: 2005 + A1: 2007 Annex B BS EN 450-1: 2012 Annex B

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Pulverized fuel ash (Chemical analysis)	Loss-on-ignition	BS EN 196-2: 2013 Cl. 4.4.1 (using an ignition time of 1 hour) BS EN 450-1: 2012 Cl. 5.2.2 & BS EN 196-2: 2005 Cl. 7 (using an ignition time of 1 hour)
	Sulphate content (as SO ₃)	BS EN 196-2: 2013 Cl. 4.4.2 BS EN 450-1: 2012 Cl. 5.2.4 & BS EN 196-2: 2005 Cl. 8
	Manganese content (Mn) Manganese oxide content (MnO) Manganese trioxide content (Mn ₂ O ₃)	BS EN 196-2: 2005 Cl. 12 BS EN 196-2: 2013 Cl. 4.4.6
	Impure silica content (SiO ₂)	BS EN 196-2: 2005 Cl. 13.2, 13.4 BS EN 196-2: 2013 Cl. 4.5.2, 4.5.4
	Pure silica content (SiO ₂)	BS EN 196-2: 2005 Cl. 13.6 BS EN 196-2: 2013 Cl. 4.5.6
	Soluble silica content (SiO ₂)	BS EN 196-2: 2005 Cl. 13.8 BS EN 196-2: 2013 Cl. 4.5.8
	Total silica content (SiO ₂)	BS EN 196-2: 2013 Cl. 4.5.9 BS EN 450-1: 2012 Cl. 5.2.8 & BS EN 196-2: 2005 Cl. 13.9
	Iron (III) oxide content	BS EN 196-2: 2013 Cl. 4.5.10 BS EN 450-1: 2012 Cl. 5.2.8 & BS EN 196-2: 2005 Cl. 13.10
	Aluminium oxide content	BS EN 196-2: 2013 Cl. 4.5.11 BS EN 450-1: 2012 Cl. 5.2.8 & BS EN 196-2: 2005 Cl. 13.11
	Calcium oxide content	BS EN 196-2: 2005 Cl. 13.14 (Alternative method) BS EN 196-2: 2013 Cl. 4.5.14 (Alternative method)
	Magnesium oxide content	BS EN 196-2: 2013 Cl. 4.5.15 (Alternative method) BS EN 450-1: 2012 Cl. 5.2.10 & BS EN 196-2: 2005 Cl. 13.15 (Alternative method)

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Pulverized fuel ash (Chemical analysis) (cont'd)	Sodium oxide content	BS EN 196-2: 2005 Cl. 17 BS EN 196-2: 2013 Cl. 4.5.19
	Potassium oxide content	BS EN 196-2: 2005 Cl. 17 BS EN 196-2: 2013 Cl. 4.5.19
	Alkali content (sodium oxide equivalent)	BS EN 196-2: 2013 Cl. 4.5.19 BS EN 450-1: 2012 Cl. 5.2.9 & BS EN 196-2: 2005 Cl. 17
	Chloride ion content (Cl ⁻)	BS EN 196-2: 2013 Cl. 4.5.16 BS EN 450-1: 2012 Cl. 5.2.3 & BS EN 196-2: 2005 Cl. 14

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Silica fume (chemical analysis)	Loss-on-ignition	BS EN 196-2: 2005 Cl.7 (using an ignition time of 1 hour) BS EN 13263-1: 2005 + A1: 2009 Cl. 5.2.7 & BS EN 196-2: 2013 Cl. 4.4.1 (using an ignition time of 1 hour)
	Sulphate content (as SO ₃)	BS EN 196-2: 2005 Cl. 8 BS EN 13263-1: 2005 + A1: 2009 Cl. 5.2.4 & BS EN 196-2: 2013 Cl. 4.4.2
	Silicon dioxide content (SiO ₂)	BS EN 196-2: 2005 Cl. 13.2, 13.3 & Cl. 13.6 BS EN 13263-1: 2005 + A1: 2009 Cl. 5.2.1 & BS EN 196-2: 2013 Cl. 4.5.2, 4.5.3 & Cl. 4.5.6
	Sodium oxide content	BS EN 196-2: 2005 Cl. 17 BS EN 196-2: 2013 Cl. 4.5.19
	Potassium oxide content	BS EN 196-2: 2005 Cl. 17 BS EN 196-2: 2013 Cl. 4.5.19
	Alkali content (sodium oxide equivalent)	BS EN 196-2: 2005 Cl.17 BS EN 13263-1: 2005 + A1: 2009 Cl. 5.2.5 & BS EN 196-2: 2013 Cl. 4.5.19
	Chloride ion content (Cl ⁻)	BS EN 196-2: 2005 Cl.14 BS EN 13263-1: 2005 + A1: 2009 Cl. 5.2.6 & BS EN 196-2: 2013 Cl. 4.5.16
	Free calcium oxide content	BS EN 451-1: 2003 BS EN 451-1: 2017

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Road surfaces	Texture depth of carriageways (sand patch method)	General Specification for Civil Engineering Works (2006) Vol. 1 App. 10.1 General Specification for Civil Engineering Works (2020) Vol. 1 App. 10.1 Hong Kong Housing Authority Specification Library (2008) EXT 2.T910.5 to T1010.5 Hong Kong Housing Authority Specification Library (2012) EXT 2.T910.5 to T1010.5
	Surface regularity of carriageways	General Specification for Civil Engineering Works (2006) Vol. 1 Cl. 9.42 to 9.43, Cl. 10.55 to 10.56 General Specification for Civil Engineering Works (2020) Vol. 1 Cl. 9.42 to 9.43, Cl. 10.55 to 10.56 Hong Kong Housing Authority Specification Library (2008) EXT 2.T810.5 to T850.5 Hong Kong Housing Authority Specification Library (2012) EXT 2.T810.6 to T850.6
Soil (Chemical analysis)	Organic matter content	GEOSPEC 3: 2001 Test 9.1 GEOSPEC 3: 2017 Test 9.1
	Loss-on-ignition	GEOSPEC 3: 2001 Test 9.2 GEOSPEC 3: 2017 Test 9.2
	Total sulphate content (as SO ₃)	GEOSPEC 3: 2001 Test 9.3 GEOSPEC 3: 2017 Test 9.3
	Water-soluble sulphate content (as SO ₃)	GEOSPEC 3: 2001 Test 9.3 GEOSPEC 3: 2017 Test 9.3
	Water-soluble chloride content	GEOSPEC 3: 2001 Test 9.4 GEOSPEC 3: 2017 Test 9.4
	pH value	GEOSPEC 3: 2001 Test 9.5 GEOSPEC 3: 2017 Test 9.5
	Carbonate content (as CO ₂)	BS 1377: Part 3: 1990 (Amd 9028) Cl. 6 <excluding cl. 6.4> BS 1377: Part 3: 2018 + A1: 2021 Cl. 8.3

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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 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
	Dry density/moisture content relationship of soils containing particles which are not susceptible to crushing (using 1000 cc 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 1000 cc mould and 2.5 kg rammer)	GEOSPEC 3: 2001 Test 10.2 GEOSPEC 3: 2017 Test 10.2

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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 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 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 1000 cc 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 1000 cc 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 CBR mould and 4.5 kg rammer)	GEOSPEC 3: 2001 Test 10.7 GEOSPEC 3: 2017 Test 10.7
	Dry density/moisture content relationship of soils containing particles which are susceptible to crushing (using CBR mould and 4.5 kg rammer)	GEOSPEC 3: 2001 Test 10.8 GEOSPEC 3: 2017 Test 10.8
	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)	GEOSPEC 3: 2001 Test 11.1 GEOSPEC 3: 2017 Test 11.1
	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)	GEOSPEC 3: 2001 Test 11.2 GEOSPEC 3: 2017 Test 11.2
	Relative compaction of fill material	GEOSPEC 3: 2001 Test 11.4 GEOSPEC 3: 2017 Test 11.4

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Structural fixings	<p>Tensile proof load test of anchors, dowel bars & channel inserts by incremental loading in the force range 2 kN - 600 kN</p> <p>Tensile proof load test of drilled-in anchors used for cantilevered structure/hanger/curtain wall remedial works by incremental loading in the force range 2 kN – 600 kN</p> <p>Tensile proof load test of drilled-in anchors used for works other than cantilevered structure/hanger/curtain wall remedial works in the force range 2 kN – 600 kN</p> <p>Tensile proof load test for cementitious or polymer based grouted bolts or dowels or reinforcing bars works or/and steel T-bolts with cast-in channels in the force range 2 kN – 600 kN</p> <p>Shear test of anchors or dowel bars by incremental loading in the force range 1 kN – 200 kN</p> <p>Shear proof load test of drilled-in anchors used for cantilevered structure/hanger/curtain wall remedial works by incremental loading in the force range 2 kN – 200 kN</p> <p>Shear proof load test of drilled-in anchors used for works other than cantilevered structure/hanger/curtain wall remedial works in the force range 2 kN – 200 kN</p> <p>Shear proof load test for cementitious or polymer based grouted bolts or dowels bars works in the force range 2 kN – 200 kN</p>	<p>BS 5080: Part 1:1993, Cl. 6, 7.1.1 &7.1.3 with modification</p> <p>Buildings Department PNAP APP-169 (Oct 2023) App. A</p> <p>Buildings Department PNAP APP-169 (Oct 2023) App. B</p> <p>Buildings Department PNAP APP-169 (Oct 2023) App. C</p> <p>BS 5080: Part 2: 1986 + Amd. 7602 Cl. 4, 7.1, 7.2.1 & 7.2.3</p> <p>Buildings Department PNAP APP-169 (Oct 2023) App. A</p> <p>Buildings Department PNAP APP-169 (Oct 2023) App. B</p> <p>Buildings Department PNAP APP-169 (Oct 2023) App. C</p>
Welds (destructive)	<p>Bend test on welds in metallic materials</p> <p>Bend test on arc stud welding in metallic materials</p>	<p>BS EN 910: 1996</p> <p>BS EN ISO 5173: 2010 + A1: 2011</p> <p>BS EN ISO 14555: 2017 Cl. 11.3</p>

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Welds (destructive) (cont'd)	Bend test on welding of reinforcing steel Charpy V-notch impact test on welds in metallic materials Fracture test on welds in metallic materials Longitudinal tensile test on weld metal in fusion welded joints in the force range 3 kN – 2000 kN Macroscopic examination on welds in metallic materials Macro examination of arc stud welding in metallic materials Shear test on welding of reinforcing steel in the force range 3 kN–2000kN Tensile test on welds in metallic materials in the force range 3 kN – 2000 kN Tensile test on arc stud welding in metallic materials in the force range of 3 kN - 2000 kN Tensile test on welding of reinforcing steel in the force range 3 kN – 2000 kN Vickers hardness test across welded joints in the scale of HV 5 to HV 10	BS EN ISO 17660-1: 2006 Cl. 14.4 BS EN 875: 1995 BS EN ISO 9016: 2012 BS EN ISO 9016: 2022 BS EN 1320: 1997 ISO 9017: 2001 BS EN ISO 9017: 2018 BS EN 876: 1995 BS EN ISO 5178: 2011 BS EN ISO 5178: 2019 BS EN 1321: 1997 BS EN ISO 17639: 2013 BS EN ISO 17639: 2022 BS EN ISO 14555: 2017 Cl. 11.6 BS EN ISO 17660-1: 2006 Cl. 14.3 BS EN 10002-1: 2001 BS EN ISO 6892-1: 2009 Method B BS EN ISO 6892-1: 2016 Method B BS EN ISO 6892-1: 2019 Method B in conjunction with the following specification(s): BS EN 895: 1995 BS EN ISO 4136: 2012 BS EN ISO 4136: 2022 BS EN ISO 6892-1: 2009 Method B BS EN ISO 6892-1: 2016 Method B BS EN ISO 6892-1: 2019 Method B in conjunction with the following specification(s): BS EN ISO 14555: 2017 Cl. 11.4 BS EN ISO 17660-1: 2006 Cl. 14.2 BS EN 1043-1: 1996 BS EN ISO 9015-1: 2011 ISO 9015-1: 2011

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Welds (non-destructive)	Magnetic particle test (Magnetic flow method, colour contrast technique using permanent magnets, A.C. yokes)	BS 6072: 1981 BS EN 1290: 1998 BS EN ISO 9934-1: 2016 BS EN ISO 17638: 2009 BS EN ISO 17638: 2016 in conjunction with the following specification(s): BS 2971: 1991 Section 7 BS 4515-1: 2009 Table 9 BS 5400-6: 1999 Cl. 5.5.2.4.1 BS 5135: 1984 Table 18 & 19 BS EN ISO 5817: 2007 Table 1 BS EN ISO 5817: 2014 Table 1 BS EN ISO 5817: 2023 Table 1 BS EN ISO 23278: 2015 Cl. 5 & Table 1 Buildings Department Code of Practice for the Structural Use of Steel (2005) Table 14.3b Buildings Department Code of Practice for the Structural Use of Steel (2011) Table 14.3b Buildings Department Code of Practice for the Structural Use of Steel (2023) Table 14.3b Hong Kong International Airport General Material & Workmanship Specification (GMWS) Issue No. 5b (2019) Vol. 1 – Civil & Structural Works Section 22.6.22
	Liquid penetrant test (Colour contrast method)	BS 6443: 1984 BS EN 571-1: 1997 BS EN ISO 3452-1: 2013 in conjunction with the following specification(s): BS 2971: 1991 Section 7 BS 4515-1: 2009 Table 9 BS 5135: 1984 Table 18 & 19 BS EN ISO 5817: 2007 Table 1 BS EN ISO 5817: 2014 Table 1 BS EN ISO 5817: 2023 Table 1 BS EN ISO 23277: 2015 Table 1 Buildings Department Code of Practice for the Structural Use of Steel (2005) Table 14.3b Buildings Department Code of Practice for the Structural Use of Steel (2011) Table 14.3b Buildings Department Code of Practice for the Structural Use of Steel (2023) Table 14.3b Hong Kong International Airport General Material & Workmanship Specification (GMWS) Issue No. 5b (2019) Vol. 1 – Civil & Structural Works Section 22.6.22

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Welds (non-destructive) (Cont'd)	Ultrasonic test (Butt welds in plates & pipes, 'T'joint welds, nozzle welds & node welds)	BS 3923: Part 1: 1986 (Level 1, 2a, 2b & 3) BS EN 1714: 1998 (Level A, B, & C) BS EN ISO 17640: 2010 (Level A, B, & C) BS EN ISO 17640: 2018 (Level A, B, & C) in conjunction with the following specification(s): BS 2971: 1991 Section 7 BS 4515-1: 2009 Table 9 BS 5135: 1984 Table 18 BS 5400-6: 1999 Cl. 5.5.2.4.2 BS EN ISO 5817: 2007 Table 1 BS EN ISO 5817: 2014 Table 1 BS EN ISO 5817: 2023 Table 1 BS EN ISO 11666: 2010 Annex A BS EN ISO 11666: 2018 Annex A Buildings Department Code of Practice for the Structural Use of Steel (2005) Table 14.3b Buildings Department Code of Practice for the Structural Use of Steel (2011) Table 14.3b Buildings Department Code of Practice for the Structural Use of Steel (2023) Table 14.3b Hong Kong International Airport General Material & Workmanship Specification (GMWS) Issue No. 5b (2019) Vol. 1 – Civil & Structural Works Section 22.6.22

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Welds (non-destructive) (Cont'd)	Visual examination	BS 5289: 1976 BS EN 970: 1997 BS EN ISO 17637: 2011 BS EN ISO 17637: 2016 in conjunction with the following specification(s): BS 2971: 1991 Section 7 BS 4515-1: 2009 Table 9 BS 5135: 1984 Table 18 & 19 BS 5400-6: 1999 Cl. 5.5.2.4.1 BS EN ISO 5817: 2007 Table 1 BS EN ISO 5817: 2014 Table 1 BS EN ISO 5817: 2023 Table 1 BS EN ISO 14555: 2017 Table A.5 and A6 Buildings Department Code of Practice for the Structural Use of Steel (2005) Table 14.3b Buildings Department Code of Practice for the Structural Use of Steel (2011) Table 14.3b Buildings Department Code of Practice for the Structural Use of Steel (2023) Table 14.3b Hong Kong International Airport General Material & Workmanship Specification (GMWS) Issue No. 5b (2019) Vol. 1 – Civil & Structural Works Section 22.6.22
	Visual examination and bend test on stud connectors	<Visual examination as follows:> BS 5289: 1976 BS EN 970: 1997 BS EN ISO 17637: 2011 BS EN ISO 17637: 2016 < together with the following bend test method:> BS 5400-6: 1999 Cl. 5.5.4(b) in conjunction with the following specification: Buildings Department Code of Practice for the Structural Use of Steel (2011) Cl. 14.3.7.3

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Water (Chemical analysis)	Sulphate content Total dissolved solids Chloride content Total alkalinity pH value Sodium oxide content (Na ₂ O) Potassium oxide content (K ₂ O) Alkali content (equivalent Na ₂ O)	In-house method WAT-C-001 (Gravimetric) APHA 23e 2540C APHA 23e 4500-Cl ⁻ B APHA 23e 2320B In-house method WAT-C-005 BS EN 196-21: 1992 Cl. 7 (reference method) BS EN 196-21: 1992 Cl. 7 (reference method) BS EN 1008: 2002 Cl. 6.1.3 & BS EN 196-21: 1992 Cl. 7 (reference method)