



No. 032

**Castco Testing Centre Ltd.**  
佳力高試驗中心有限公司

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**CLIENTELE** : Public  
**服務對象** : 公眾

**ACCREDITED TEST CATEGORIES** : Calibration Services 校正服務  
**認可試驗類別** : Construction Materials 建築物料  
Environmental Testing 環境試驗

**SCOPE OF ACCREDITATION** : As shown on the following pages 詳見後頁  
**認可範圍**

\* \* \* \* \*



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| TEST CATEGORY<br>試驗類別        | ITEMS, MATERIALS OR PRODUCTS TESTED<br>試驗項目、物料或產品   | SPECIFIC TESTS OR PROPERTIES MEASURED<br>特定試驗或量度的特性   | BEST MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY ( $\pm$ )*<br>以不確定度表示最佳測量能力( $\pm$ )*   |
|------------------------------|---|---|---|
| CALIBRATION SERVICES<br>校正服務 | <p>Construction materials testing equipment :-<br/>(cont'd)</p> <p>- Test sieves</p> <p>Mass measurements :-</p> <p>- Balances</p> <p>- Working masses</p> <p>Mechanical metrology measurements :-</p> <p>- Dimensional measurement instruments :</p> <p>- Dial gauge</p> <p>- Electronic coating thickness measuring device</p> <p>- Engineer's steel measuring rule</p> | <p>Calibration of perforated testing sieves with size greater than 4 mm in accordance with the specification requirement in table 3 of BS 410 : 1986, in aperture size, pitch of hole, bridge width and plate thickness</p> <p>Calibration of perforated testing sieves with size greater than 4 mm in accordance with the specification requirement in table 1 and table 2 of BS 410-2 : 2000 or table 1 and table 2 of ISO 3310-2 : 1999 in size of hole, pitch and plate thickness</p> <p>Calibration of balances over the following range :-</p> <p>up to 60 kg</p> <p>Calibration of mass in accordance with in-house procedure CAL-WORK- MASS :</p> <p>1 kg – 5 kg<br/>1 mg – 1000 g</p> <p>Measurement of accuracy of performance in accordance with BS 907 : 1965</p> <p>Accuracy of readings on coating thickness gauge (in-house method CAL-ELCO)</p> <p>Accuracy of readings (in-house method CAL-ST-RULE)</p> | <p>Standard weights of OIML Class F1 from 1 mg to 60 kg</p> <p>Uncertainties quoted depend upon the quality, construction and performance of the balances under calibration</p> <p>20 mg<br/>2 mg</p> <p>6 <math>\mu</math>m</p> <p>1.6 <math>\mu</math>m</p> <p>0.082 mm</p> |

\* A REPORTED UNCERTAINTY WILL BE THAT FOR THE INSTRUMENT ITSELF DURING CALIBRATION PLUS THE APPROPRIATE MEASUREMENT CAPABILITY OF THE LABORATORY. THE UNCERTAINTIES ARE BASED ON AN ESTIMATED LEVEL OF CONFIDENCE OF 95%.

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|--|---|---|---|
| CALIBRATION SERVICES<br>(cont'd)<br>校正服務(續上) | Mechanical metrology measurements (cont'd) :-<br>- Dimensional measurement instruments (cont'd) :<br>- Extensometers<br>- Feeler gauge<br>- LVDT<br>- Measuring tape (3m to 150 m)<br>- Vernier calipers<br>- Force testing machines :<br>- compression<br>- stability testing of compression | Extensometers in accordance with BS 3846 : 1970<br>(Use of calibrating rig)<br>Calibration of feeler gauge in accordance with in-house procedure CAL-FEELER-ACC<br>Accuracy of thickness<br>Calibration of LVDT in accordance with in-house procedure CAL-LIN-DISP and A.3.4 of GEOSPEC 3 : 2001 over the following range :-<br>up to 13 mm<br>resolution 0.001 mm<br>up to 90 mm<br>resolution 0.006 mm<br>Accuracy of reading (in-house method CAL-MTAPE)<br>Measurement of deviation of reading in accordance with BS 887 : 1982<br>Universal testing machines in compression in accordance with BS 1610 : Part 1 : 1985 (AMD 6175)<br>Concrete testing machines in compression in accordance with BS 1610 : Part 1 : 1985 (AMD 6175)<br>Stability testing of compression testing machines in accordance with BS 1881 : Part 115 : 1986 (AMD 6536)<br>CS 1 : 1990 Appendix D | Grade A for gauge lengths not less than 365 mm<br>Grade B for gauge lengths not less than 177 mm<br>Grade C for gauge lengths not less than 84 mm<br>Grade D for gauge lengths not less than 28 mm<br>1.8 $\mu$ m<br>0.002 mm<br>0.009 mm<br>0.9 mm for 3 to 20 m<br>(0.584 + 0.013L)mm for tapes > 20 m, L in meters<br>12 $\mu$ m<br>Grade 0.5 in the range 2 kN - 100 kN<br>Grade 1.0 in the range 2 kN - 5.0 MN<br>Grade 2.0 in the range 2 kN - 5.0 MN<br>Grade 0.5 in the range 2 kN - 100 kN<br>Grade 1.0 in the range 2 kN - 5.0 MN<br>Grade 2.0 in the range 2 kN - 5.0 MN |

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|--|---|---|---|
| CALIBRATION SERVICES<br>(cont'd)<br>校正服務(續上) | Temperature and humidity measurement (cont'd) :-<br>- Platinum resistance thermometers and other types of precision sensor<br><br>- Standard platinum resistance thermometer<br><br>- Relative humidity measurement instrument<br><br>- Thermocouples<br><br>- Thermometers, liquid in glass and electronic types<br><br>- Temperature recorders, temperature sensors and thermostats | Calibration of standard platinum resistance thermometer in accordance with in-house procedure CAL_SPRT over the following range :<br>-15 °C – 200 °C<br><br>Calibration of hygrometer / psychrometer using conditioned chamber in accordance with in-house procedure CAL_THER-HYGRO over the following range :<br>30 – 95 % RH set at 23 ± 2 °C<br><br>Calibration of walk-in chamber in accordance with in-house procedure CAL-WKN-CHAMBER for temperature 23 ± 2 °C and humidity variation variations over the following range :<br>30 – 95 % RH<br><br>Calibration of thermocouple thermometer in accordance with in-house procedure CAL-THERMOMETER over the following Range :<br>-15 °C – 200 °C<br><br>Calibration of working thermometer in accordance with in-house procedure CAL-THERMOMETER over the following Range :<br>-15 °C – 200 °C<br><br>Calibration of thermograph in accordance with in-house procedure CAL-THERMOMETER over the following Range :<br>-15 °C – 200 °C | 0.08 °C (for the range -15 °C to 100 °C))<br>0.42 °C (for the range above 100 °C to 200 °C)<br><br>0.26 °C, 2.0% RH<br><br>0.17 °C, 1.8% RH<br><br>0.12 °C (for the range -15 °C to 100 °C))<br>0.6 °C (for the range above 100 °C to 200 °C)<br><br>0.12 °C (for the range -15 °C to 100 °C))<br>0.6 °C (for the range above 100 °C to 200 °C)<br><br>0.12 °C (for the range -15 °C to 100 °C))<br>0.6 °C (for the range above 100 °C to 200 °C) |

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|--|---|--|---|
| CONSTRUCTION MATERIALS<br>(cont'd)<br>建築物料(續上) | Aggregates<br>(cont'd)                            | Relative density and water absorption  | BS 812 : Part 2 : 1975 (AMD 4615)<br>(Pycnometer method and Wire basket method) |
|  |   | Resistance to degradation of large size coarse aggregate by abrasion and impact in the Los Angeles Machine | ASTM C535-96 with modification  |
|  |   | Resistance to degradation of small size coarse aggregate by abrasion and impact in the Los Angeles Machine | ASTM C131-96 with modification  |
|  |   | Shell content  | BS 812 : Part 106 : 1985  |
|  |   | Ten per cent fines value   | BS 812 : Part 3 : 1975 (AMD 4616)<br>BS 812 : Part 111 : 1990                   |
|  |   | Detection of Potential Alkali Reactivity of aggregate<br>- ultra-accelerated mortar bar method             | RILEM A-TC 106-2 - 2000   |
|  |   | Potential Alkali Reactivity of aggregates<br>- mortar bar method   | ASTM C 1260 - 1994  |
|  |   | Detection of Alkali-silica Reactive Aggregates<br>- accelerated expansion of mortar bars                   | CSA A23.2-25A - 2000  |
|  |   | Assessment of Alkali Reactivity of aggregates<br>- accelerated mortar bars tests method                    | MTRC Specification, MTRC/NW/CIV/M&W/011/A1<br>Appendix 11.8                     |
|  | Aggregates<br>(Site tests)                        | Sampling   | BS 812 : Part 102 : 1984<br>BS 812 : Part 102 : 1989                            |
|  | Aggregates<br>(Chemical analysis)                 | Chloride ion content   | BS 812 : Part 117 : 1988 Appendix C <i>Excluding</i> Cl. 4                      |
|  |   | Water-soluble sulphate content   | BS 812 : Part 118 : 1988 Cl. 5 <i>Excluding</i> Cl. 4<br>(Gravimetric)          |
|  |   | Total sulphate (acid extraction)   | BS 812 : Part 118 : 1988 Cl. 6 <i>Excluding</i> Cl. 4                           |
|  |   | Acid-soluble material  | BS 812 : Part 119 : 1985 <i>Excluding</i> Cl. 4                                 |
|  |   | Soundness  | BS 812 : Part 121 : 1989  |
|  |   | Soluble silica (SiO <sub>2</sub> )   | HKHA MTS (97/99) Specification Part D Cl. 1.4.9                                 |
|  | Soluble calcium oxide (CaO)                       | HKHA MTS (97/99) Specification Part D Cl. 1.4.9  |   |
|  | Potential reactivity                              | ASTM C289-87 <i>Excluding</i> Cl. 9  |   |

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|---|---|---|--|
| CONSTRUCTION MATERIALS<br>(cont'd)<br>建築物料(續上)                          | Anchor bolt and dowel bar                         | Tensile proof load test on anchor bolts and dowel bars in concrete and masonry  | In-house method NDT-STR-FIX  |
|   | Bentonite   | Determination of pH value of bentonite slurry (pH indication paper method)  | In-house method  |
|   |   | Determination of pH value of bentonite slurry (pH imeter method)  | API Recommended Practice 13B – 1, 2 <sup>nd</sup> . edition : 1997 : Cl. 9 (excluding Cl. 9.4) |
|   |   | Determination of the plastic viscosity, yield point, apparent viscosity and 10 minute gel strength of bentonite slurry by the Fann viscometer | API Recommended Practice 13B – 1, 2 <sup>nd</sup> . edition : 1997 : Cl. 4.3                   |
|   |   | Determination of the viscosity of bentonite slurry by the Marsh cone method.  | API Recommended Practice 13B – 1, 2 <sup>nd</sup> . edition : 1997 : Cl. 4.2                   |
|   |   | Standard test method for density of bentonite slurries  | API Recommended Practice 13B – 1, 2 <sup>nd</sup> . edition : 1997 : Cl. 3 (excluding Cl. 3.6) |
|   |   | Standard test method for sand content by Volume of bentonite slurries   | ASTM D4380-84 (Reapproved 1993)  |
|   | Bituminous materials                              | Sieve analysis of fine and coarse aggregates and materials finer than 75 µm sieve in mineral aggregates by washing                            | API Recommended Practice 13B – 1, 2 <sup>nd</sup> . edition : 1997 : Cl. 7                     |
|   |   | Sieve analysis of fine and coarse aggregates and materials finer than 75 µm sieve in mineral aggregates by washing                            | ASTM D4381-84 (Reapproved 1993)  |
|   |   | Sieve analysis of fine and coarse aggregates and materials finer than 75 µm sieve in mineral aggregates by washing                            | ASTM C117-95 and ASTM C136-96a with modifications  |
|   |   | Theoretical maximum specific gravity and density of bituminous paving mixture   | ASTM D2041-95 (weighing in water using type A container) with modifications                    |
|   |   | Quantitative extraction of bitumen from bituminous paving mixtures  | ASTM D2172-95 method A, Ashing method with modifications                                       |
|   |   | Bulk specific gravity and density of non-absorptive compacted bituminous mixtures   | ASTM D2726-96a   |
| Percent air void in compacted dense and open bituminous paving mixtures | ASTM D3203-94                                     |   |  |

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| CONSTRUCTION MATERIALS<br>(cont'd)<br>建築物料(續上) | Blocks & Bricks                                   | Compressive strength of clay bricks<br><br>Dimensions check of clay bricks<br><br>Dimensional check of clay and calcium silicate pavers<br><br>Compressive strength of precast concrete blocks & bricks<br><br>Transverse strength of precast concrete blocks<br><br>Transverse breaking load of clay & calcium silicate pavers<br><br>Transverse breaking load of clay & calcium silicate pavers<br><br>Compressive strength of precast concrete paving blocks<br><br>Compressive strength of interlocking blocks<br><br><br><br>Skid resistance test of clay and calcium silicate pavers<br><br>Skid resistance test of clay and calcium silicate pavers (for laboratory test only)<br><br>Water absorption of clay bricks<br><br><br><br>Water absorption of concrete flags, kerbs, channels and edgings<br><br>Water absorption of masonry units and segmental pavers | BS 3921 : 1985, Cl. 7, Appendix D<br><br>BS 3921 : 1985, Cl. 4, Appendix A<br><br>BS 6677 : Part 1: 1986, Cl. 5, Appendix A and C<br><br>BS 6073 : Part 1 : 1981, Cl. 10, Appendix A & B<br><br>BS 6073 : Part 1 : 1981, Cl. 10.1, Appendix A & C<br><br>BS 6677 : Part 1 : 1986, Cl. 5, Appendix A & C<br><br>BS 6677 : Part 1 : 1986, Cl. 6, Appendix D<br><br>BS 6717 : Part 1 : 1993, Cl. 11, Appendix A & B<br><br>HKHA Specification (97 ed.), RAP3.T010.1 to T060.1<br>HKHA Specification (98 ed.), RAP3.T010.2 to T060.2<br>HKHA Specification (2000 ed.), RAP3.T010.3 to T060.3<br>General specification for civil engineering works : 1992, Cl. 11.75 to 11.78<br><br>BS 6677 : Part 1 : 1986, Appendix E<br><br>ASTM E303 – 93 (Reapproved 1998)<br><br>BS 3921 : 1985, Cl. 8, Appendix E<br><br><br>BS 7263 : Part 1 : 1994, Appendix C<br><br>AS/NZS 4456.14 : 1997 |

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| CONSTRUCTION MATERIALS<br>(cont'd)<br>建築物料(續上) | BRE screed test                                   | Determination of soundness of bonded and unbonded screeds                 | BS 8204 : Part 1: 1987, Appendix B<br>BS 8204 : Part 1: 1999, Annex C   |
|  | Cement and Portland pulverized fuel ash cement    | Compressive strength of broken prism in the force range 10 kN - 140 kN    | BS EN 196 : Part 1 : 1995   |
|  |   | Compressive strength of concrete cubes in the force range 20 kN - 2500 kN | BS 4550 : Part 3 : Section 3.4 : 1978 (AMD 4247, 4498, 5704)  |
|  |   | Compressive strength of mortar cubes in the force range 20 kN - 2500 kN   | BS 4550 : Part 3 : Section 3.4 : 1978 (AMD 4247, 4498, 5704)  |
|  |   | Density   | BS 4550 : Part 3 : Section 3.2 : 1978   |
|  |   | Fineness  | BS 4550 : Part 3 : Section 3.3 : 1978 (Using the method stated in Appendix D of BS 4359 : Part 2 : 1982)<br>BS EN 196 : Part 6 : 1992 (Blaine method) |
|  |   | Flexural strength of mortar prism   | BS EN 196 : Part 1 : 1995   |
|  |   | Setting times   | BS 4550 : Part 3 : Section 3.6 : 1978 (AMD 5706)<br>BS EN 196 : Part 3 : 1995, Cl. 6<br>ASTM C191-92  |
|  |   | Soundness   | BS 4550 : Part 3 : Section 3.7 : 1978 (AMD 5707)<br>BS EN 196 : Part 3 : 1995, Cl. 7  |
|  | Cement (Portland blast furnace cement)            | Compressive strength  | BS EN 196 : Part 1 : 1995   |
|  |   | Initial setting time  | BS EN 196 : Part 3 : 1995, Cl. 6  |
|  |   | Soundness   | BS EN 196 : Part 3 : 1995, Cl. 7  |
|  | Cement (Site tests)                               | Sampling  | BS 4550 : Part 1 : 1978   |

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|--|---|---|--|
| CONSTRUCTION MATERIALS<br>(cont'd)<br>建築物料(續上) | Cement<br>(Chemical analysis)                     | Heat of hydration<br><br>Alumina content (Al <sub>2</sub> O <sub>3</sub> )<br><br>Chloride ion content (Cl)<br><br>Insoluble residue content<br><br>Residue insoluble in hydrochloric acid and sodium carbonate<br><br>Iron oxide content (Fe <sub>2</sub> O <sub>3</sub> )<br><br>Lime saturation factor<br><br>Loss-on-ignition (L.O.I.)<br><br>Magnesia content (MgO)<br><br>Sulphuric anhydride content (as SO <sub>3</sub> )<br><br>Sulphate content (as SO <sub>3</sub> )<br><br>Total calcium oxide content (CaO)<br><br>Silica content (SiO <sub>2</sub> )<br><br>Total sulphur content (S)<br><br>Tricalcium aluminate content (C <sub>3</sub> A)<br><br>Potassium oxide content<br><br>Sodium oxide content<br><br>Nitric acid soluble alkali content | BS 4550 : Part 3 : Section 3.8 : 1978 with modification<br><br>BS 4550 : Part 2 : 1970 Cl. 7.2<br><br>BS 4550 : Part 2 : 1970 Cl. 17 (AMD 5713)<br>BS EN 196-21 : 1992 Cl. 4<br><br>BS 4550 : Part 2 : 1970 Cl. 3.1<br><br>BS EN 196-2 : 1995 Cl. 9<br><br>BS 4550 : Part 2 : 1970 Cl. 8<br><br>BS 12 : 1978 Cl. 6.1<br><br>BS 4550 : Part 2 : 1970 Cl. 13.2<br>BS EN 196-2 : 1995 Cl. 7<br><br>BS 4550 : Part 2 : 1970 Cl. 9.2<br><br>BS 4550 : Part 2 : 1970 Cl. 10<br><br>BS EN 196-2 : 1995 Cl. 8<br><br>BS 4550 : Part 2 : 1970 Cl. 6.2<br><br>BS 4550 : Part 2 : 1970 Cl. 4.2.1<br><br>BS 4550 : Part 2 : 1970 Cl. 12<br><br>BS 12 : 1978<br>BS 12 : 1989<br><br>BS 4550 : Part 2 : 1970 Cl. 16.2.4.2 (AMD 4260)<br><br>BS 4550 : Part 2 : 1970 Cl. 16.2.4.2 (AMD 4260)<br><br>BS 4550 : Part 2 : 1970 Cl. 16.2.4.1 (AMD 4260) |
|  | Coating   | Pull-off test on coating<br><br>Zinc and Zinc alloy coatings on iron and steel articles by gravimetric method   | In-house Method PULL.COAT<br><br>BS 729 : 1971, Appendix A<br>BS EN ISO 1460 : 1995  |

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|--|--|--|---|
| CONSTRUCTION MATERIALS<br>(cont'd)<br>建築物料(續上) | Concrete   | Mixing and sampling in laboratory  | CS1 : 1990, Section 11 (AMD 1201)   |
|  | Workability<br>(Slump)   | BS 1881 : Part 102 : 1983<br>CS 1 : 1990 Section 2 (AMD 1101 & 1102)                                   |   |
|  | Density of fresh concrete  | BS 1881 : Part 107 : 1983<br>CS 1 : 1990 Section 5 (AMD 1101)  |   |
|  | Curing of test specimens<br>(Tropical zone temperature)  | BS 1881 : Part 111 : 1983<br>CS 1 : 1990 Section 10 (AMD 1101)   |   |
|  | Density of hardened concrete   | BS 1881 : Part 114 : 1983<br>CS 1 : 1990 Section 16 (AMD 1201 & 1203)                                  |   |
|  | Compressive strength of cubes<br>in the force range 10 kN - 4000 kN  | BS 1881 : Part 116 : 1983<br>BS 1881 : Part 4 : 1970<br>CS 1 : 1990 Section 12 (AMD 1201, 1202 & 1203) |   |
|  | Flexural strength of beams<br>in the force range 2 kN - 250 kN   | BS 1881 : Part 118 : 1983<br>CS 1 : 1990 Section 14 (AMD 1201)   |   |
|  | Compressive strength of cores<br>in the force range 10 kN - 4000 kN  | BS 1881 : Part 120 : 1983<br>BS 1881 : Part 4 : 1970<br>CS 1 : 1990 Section 15 (AMD 1201 & 1203)       |   |
|  | Water absorption   | BS 1881 : Part 122 : 1983  |   |
|  | Assessment of the cement, aggregates and water contents of fresh concrete<br>(Pressure filter Sandberg method) | DD 83 : 1983 Sections 2 & 3  |   |
|  | Tensile splitting strength   | CS 1 : 1990 Section 13 (AMD 1203 & 1204)   |   |
|  | Electrical indication of concrete's ability to resist chloride ion penetration                                 | AASHTO T277 - 93<br>ASTM C1202 - 97  |   |
|  | Concrete<br>(non-destructive testing)  | Half cell potential measurement  | ASTM C876-91 (Method A and B for pre-wetting)   |
|  |  | Surface hardness testing by rebound hammer (Type N)  | BS 1881 : 202 : 1986, Cl. 6   |
|  |  | Spot checking concrete cover by electromagnetic covermeter   | BS 1881 : 204 : 1988, Cl. 7.3   |
|  |  | Carbonation test for freshly broken concrete surface   | In-house method (CARBON.INSITU)<br>HKHA, MTS (97/99) Specification, Part D, Cl. 4.3.1, Method 1 |

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|--|---|---|---|
| CONSTRUCTION MATERIALS<br>(cont'd)<br>建築物料(續上) | Concrete<br>(non-destructive testing)<br>(cont'd)<br><br>Concrete<br>(Site tests) | Measurement of velocity of ultrasonic pulses in concrete<br><br>Sampling of fresh concrete<br><br>Workability<br>(Slump)<br><br>Density of fresh concrete<br><br>Making of test specimens (cubes)<br><br>Making of test specimens (beams)<br><br>Making of test specimens (cylinders)<br><br>Compaction factor<br><br>Flow<br><br>Air content<br><br>Bleeding<br><br>Stiffening time<br><br>Temperature measurement<br><br>Curing of test specimens<br>(Tropical zone temperature)<br><br>Obtaining core samples<br><br>Pull-off site<br><br>Setting time monitoring<br><br>Dry cutting of mini-cores not exceeding 75mm dia. Irrespective of length<br><br>Cutting of stitch cores | BS 1881 : 203 : 1986, Cl. 6.2<br><br>BS 1881 : Part 101 : 1983<br>CS 1 : 1990 Section 1 (AMD 1101)<br><br>BS 1881 : Part 102 : 1983<br>CS 1 : 1990 Section 2 (AMD 1101 & 1102)<br><br>BS 1881 : Part 107 : 1983<br>CS 1 : 1990 Section 5 (AMD 1101)<br><br>BS 1881 : Part 108 : 1983<br>CS 1 : 1990 Section 7 (AMD 1101 & 1102)<br><br>BS 1881 : Part 109 : 1983<br>CS 1 : 1990 Section 8 (AMD 1101)<br><br>CS1 : 1990, Section 9 (AMD 1101, 1102)<br><br>CS1 : 1990, Section 3 (AMD 1101, 1102)<br><br>BS 1881 : Part 105 : 1984<br><br>CS1 : 1990, Section 6 (AMD 1101, 1102)<br><br>MTRC Materials & Workmanship Specification<br>Vol. 2 of 6, Clause 11.40(6), 1997<br><br>MTRC Materials & Workmanship Specification<br>Vol. 2 of 6, Clause 11.40(9), 1997<br><br>In-house method (CON-TEMP)<br><br>BS 1881 : Part 111 : 1983<br>CS 1 : 1990 Section 10 (AMD 1101)<br><br>CS1 : 1990 : Section 15 (AMD 1201)<br><br>HKHA MTS (00/02) Specification Part D Cl. 4.1.3<br><br>HKHA MTS (97/99) Specification Part D Cl. 1.3.9<br><br>HKHA MTS (97/99) Specification Part D Cl. 6.2<br><br>HKHA MTS (97/99) Specification Part D Cl. 6.3 |

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|--|---|--|---|
| CONSTRUCTION MATERIALS<br>(cont'd)<br>建築物料(續上) | Concrete<br>(Chemical analysis)                   | pH value<br><br>Oven-dried bulk density<br><br>Cement content and Aggregate/Cement ratio<br><br>Detection of PFA<br><br>Cement and aggregate content<br><br>Original water content<br><br>Identification of type of aggregate<br><br>Chloride ion content<br><br>Sulphate content<br><br>Carbonate content | In-house Method CON-CML-PH<br><br>BS 1881 : Part 124 : 1988 Cl. 4.2<br><br>BS 1881 : Part 124 : 1988 Cl. 5<br><br>CS 1 : 1990 Section 21.5<br><br>CS 1 : 1990 Section 21.6<br><br>BS 1881 : Part 124 : 1988 Cl. 7<br>CS 1 : 1990 Section 21.7<br><br>CS 1 : 1990 Section 21.9<br><br>BS 1881 : Part 124 : 1988 Cl. 10.2<br>CS 1 : 1990 Section 21.10.2<br><br>CS 1 : 1990 Section 21.10.3<br><br>CS 1 : 1990 Section 21.10.4.2 (Manometric) |

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|--|---|--|--|
| CONSTRUCTION MATERIALS<br>(cont'd)<br>建築物料(續上) | Door  | <p>Determination of dimensional accuracy, squareness of door leaves</p> <p>Determination of general flatness, evenness of door leaves</p> <p>Behaviour under humidity variations of door leaves</p> <p>Determination of resistance to impact, hard body of doorsets</p> <p>Determination of resistance to torsion of door leaves</p> <p>Determination of strength in the plane of the door leaf</p> <p>Test for slamming open of doorsets</p> <p>Test for slamming close of doorsets</p> <p>Determination of resistance to jarring, and vibration of doorsets</p> <p>Determination of resistance to impact (heavy body) of doorsets</p> <p>Determination of resistance to closing against an obstruction of doorsets</p> | <p>Test No. 1, Section COM 8.T210.3, HKHA Specification Library, 2000 Edition<br/>HKHA MTS (00/02) Specification Part D Cl. 7.3.1</p> <p>Test No. 2, Section COM 8.T310.3, HKHA Specification Library, 2000 Edition<br/>HKHA MTS (00/02) Specification Part D Cl. 7.3.2</p> <p>Test No. 3, Section COM 8.T410.3, HKHA Specification Library, 2000 Edition<br/>HKHA MTS (00/02) Specification Part D Cl. 7.3.3</p> <p>Test No. 4, Section COM 8.T510.3 to COM 8.T570.3, HKHA Specification Library, 2000 Edition<br/>HKHA MTS (00/02) Specification Part D Cl. 7.3.4</p> <p>Test No. 5, Section COM 8.T610.3 to COM 8.T630.3, HKHA Specification Library, 2000 Edition<br/>HKHA MTS (00/02) Specification Part D Cl. 7.3.5</p> <p>Test No. 6, Section COM 8.T710.3 to COM 8.T750.3, HKHA Specification Library, 2000 Edition<br/>HKHA MTS (00/02) Specification Part D Cl. 7.3.6</p> <p>Test No. 7 Section COM 8.T810.3 to COM 8.T820.3, HKHA Specification Library, 2000 Edition<br/>HKHA MTS (00/02) Specification Part D Cl. 7.3.7</p> <p>Test No. 8 Section COM 8.T910.3 to COM 8.T920.3, HKHA Specification Library, 2000 Edition<br/>HKHA MTS (00/02) Specification Part D Cl. 7.3.8</p> <p>Test No. 9 Section COM 8.T1010.3 to COM 8.T1030.3, HKHA Specification Library, 2000 Edition<br/>HKHA MTS (00/02) Specification Part D Cl. 7.3.9</p> <p>Test No. 10 Section COM 8.T1110.3 to COM 8.T1130.3, HKHA Specification Library, 2000 Edition<br/>HKHA MTS (00/02) Specification Part D Cl. 7.3.10</p> <p>Test No. 11 Section COM 8.T1210.3 to COM 8.T1220.3, HKHA Specification Library, 2000 Edition<br/>HKHA MTS (00/02) Specification Part D Cl. 7.3.11</p> |

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|--|---|--|---|
| CONSTRUCTION MATERIALS<br>(cont'd)<br>建築物料(續上) | Foundation piles                                  | <p>Standard test method for integrity testing of concrete deep foundations by ultrasonic crosshole testing</p> <p>Pile integrity test (PIT)</p> <p>Pile dynamic test (PDA)</p> <p>Plate load test</p> <p>Static loading tests on piles</p> <p>Ultrasonic echo sounder test</p> <p>Vibration monitoring</p> | <p>ASTM D6760 – 02</p> <p>ASTM D5882-1996</p> <p>ASTM D4945-1996</p> <p>BS 1377 : Part 9 : 1990 Clause 4.1<br/>(Incremental loading method)</p> <p>Architectural Services Department<br/>General Specification Section 5.28, 1993</p> <p>ASTM D1143-81 (re-approved 1994)<br/>Single pile testing based on Standard Loading Procedure Clause 5.1</p> <p>Building Department PNAP 66, June 2000<br/>Proof Tests :<br/>- clauses 18 and 19<br/>Proof Tests by imposition of test loads :<br/>- clause 1 of Appendix D</p> <p>General Specification for Civil Engineering Works<br/>Appendix 8.1, 1992 Edition</p> <p>Hong Kong Housing Authority Specification Library<br/>2000 Edition<br/>Loading test generally : Clauses PIL 1.T660.3 to<br/>PIL 1.T.690.3<br/>Procedure for load tests : Clauses PIL 1.T810.3 to<br/>PIL 1.T870.3<br/>Load test results : Clauses PIL 1.T1010.3 to<br/>PIL 1.T1020.3</p> <p>KCRC Major Capital Works Standard Specification<br/>Rev 0, March 2000 : Appendix A33.1</p> <p>MTRC Materials and Workmanship Specification<br/>for Civil Engineering Works, March 1998<br/>: Appendix 19.1</p> <p>In-house method FPT-KODEN-UEE</p> <p>In-house method<br/>(SMM-VIB)</p> |

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|--|---|--|---|
| CONSTRUCTION MATERIALS<br>(cont'd)<br>建築物料(續上) | Grout   | Changes in height<br><br>Setting time<br><br>Early change in height<br><br>Compressive strength of test cubes in the force range 20 kN - 2500 kN<br><br>Flow of grout for preplaced-aggregate concrete (FLOW CONE METHOD)<br><br>Bleeding and free expansion | ASTM C1090-96<br><br>ASTM C953-87 (Reapproved 1997)<br><br>ASTM C827-95a (Reapproved 1997)<br><br>In-house method GROUT-COM<br><br>ASTM C939-97<br><br>Hong Kong Authority Specification Library (1997 edition), section PIL 1. T320.1. and (1998 edition), section PIL 1.T320.2. and General Specification for Civil Engineering Works (1992), Clause 17.60. |
|  | Grout<br>(Site Test)                              | Flow of grout for preplaced-aggregate concrete (FLOW CONE METHOD)<br><br>Bleeding and free expansion   | ASTM C939-97<br><br>Hong Kong Authority Specification Library (1997 edition), section PIL 1. T320.1. and (1998 edition), section PIL 1.T320.2. and General Specification for Civil Engineering Works (1992), Clause 17.60.  |
|  | Joint filler                                      | Recovery value, reduction in mass, extrusion   | HKHA Specification Library : 2000 edition.<br>RAP2.T630.3 to RAP2.T670.3  |
|  | Metallic materials                                | Metallic materials tensile test  | BS EN 10002-1 : 1990 with modifications   |
|  |   | Tensile testing of metals  | BS 18 : Part 1 : 1987   |

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|--|---|---|--|
| CONSTRUCTION MATERIALS<br>(cont'd)<br>建築物料(續上) | Pipe  | <p>Crushing strength test of vitrified clay pipes &amp; fittings &amp; pipe joints for drains &amp; sewers</p> <p>Crushing strength test of precast concrete pipes &amp; fittings</p> <p>Crushing test of cast iron pipes &amp; fittings</p> <p>Dimension of precast concrete pipes</p> <p>Hydrostatic test of concrete pipes and fittings</p> <p>Hydrostatic test of cast iron spigot and socket drain pipes and fittings</p> <p>Hydrostatic test of grey iron pipes and fittings</p> <p>Tensile test of ductile iron pipes &amp; fittings</p> <p>Tensile test and hardness of grey iron pipes and fittings</p> <p>Testing of gravity pipeline<br/>- Water and air test</p> <p>- Infiltration test</p> <p>Water absorption test of precast concrete pipes and fittings</p> <p>Water pressure test (impermeability) of vitrified clay pipes and fittings</p> <p>Leakage test of cast iron discharge and ventilating pipes and fittings, sand-cast or spun in cast iron</p> <p>Works leaktightness test of ductile iron pipes and fittings</p> | <p>BS EN 295 : Part 3 : 1991, Cl. 4 (AMD A1)<br/>BS 65 : 1988, Cl. 6.2 Appendix B<br/>BS 65 : 1991, Cl. 6.2 Appendix B</p> <p>BS 5911 : Part 100 : 1988, Cl. 20.4, Appendix D (AMD 7588)</p> <p>BS 437 : 1978, Cl. 8, Appendix A</p> <p>BS 5911 : Part 100 : 1988 (AMD 7588), Cl. 9 and 10</p> <p>BS 5911 : Part 100 : 1988 (AMD 7588), Cl. 20.3, Appendix F</p> <p>BS 437 : 1978, Cl. 7</p> <p>BS 4622 : 1970, Cl. 15.1</p> <p>BS 4772 : 1988, Cl. 2.5, Appendix D (AMD 6270)</p> <p>BS 4622 : 1970, AMD 614, (AMD 1298 and AMD 3772), Cl. 14</p> <p>General specification for civil engineering works : 1992<br/>Cl. 5.101 to Cl. 5.103 and App. 5.4<br/>HKHA specification library : 2000,<br/>Cl. DIS3.T510.3 to Cl. DIS3.T640.3</p> <p>BS 8005 : Part 1 : 1987, Cl. 13.6</p> <p>BS 5911 : Part 100 : 1988 (AMD 7588), Cl. 20.2, Appendix E</p> <p>BS 65 : 1988, Cl. 6.4 &amp; 8.2<br/>BS 65 : 1991, Cl. 6.4 &amp; 8.2</p> <p>BS 416 : Part 1 : 1990, Spec. for spigot and socket systems, Cl. 5</p> <p>BSEN 545 : 1995, Cl. 4.7 &amp; 6.5</p> |

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|--|---|---|--|
| CONSTRUCTION MATERIALS<br>(cont'd)<br>建築物料(續上) | Polymer latex solution<br>(Chemical analysis)                         | Polymer solids content                              | HKHA Standard 002 : 1990 (modified) : Cl. 2  |
|  | Polymer-modified mortar and prebagged material<br>(Chemical analysis) | Sample treatment                                    | HKHA Standard 002 : 1990 (modified) : Cl. 6  |
|  |   | Calcium oxide content                               | HKHA Standard 002 : 1990 (modified) : Cl. 7.1  |
|  |   | Carbon dioxide content                              | HKHA Standard 002 : 1990 (modified) : Cl. 7.2  |
|  |   | Cement content and aggregate/cement ratio           | HKHA Standard 002 : 1990 (modified) : Cl. 7  |
|  |   | Polymer solids content                              | HKHA Standard 002 : 1990 (modified) : Cl. 8  |
|  | Pulverized fuel ash   | Fineness  | BS 3892 : Part 1 : 1982 (AMD 4629) Appendix A and D<br>BS 3892 : Part 1 : 1997 Annex D |
|  |   | Moisture content                                    | BS 3892 : Part 1 : 1982 (AMD 4629) Appendix A and B<br>BS 3892 : Part 1 : 1997 Annex C |
|  |   | Water requirement                                   | BS 3892 : Part 1 : 1982 (AMD 4629) Appendix E<br>BS 3892 : Part 1 : 1997 Annex E       |
|  | Pulverized fuel ash<br>(Chemical analysis)                            | Sulphuric anhydride content                         | BS 4550 : Part 2 : 1970 Cl. 10   |
|  |   | Loss-on-ignition                                    | BS 4550 : Part 2 : 1970 Cl. 13.2   |
|  |   | Magnesia  | BS 3892 : Part 1 : 1982 Appendix C (AMD 4629)  |
|  |   | Sodium oxide and potassium oxide contents           | In-house method PFA-CHM.Na-K   |
|  | Portland pulverized fuel ash cement<br>(Chemical analysis)            | Sulphuric anhydride content                         | BS 4550 : Part 2 : 1970 Cl. 12   |
|  |   | Loss-on-ignition                                    | BS 4550 : Part 2 : 1970 Cl. 13.2   |
|  |   | Magnesia  | BS 3892 : Part 1 : 1982 Appendix C (AMD 4629)  |
| Proportion of pulverized fuel ash              |   | BS 6588 : 1985 Appendix A.3                         |  |

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|--|--|--|--|
| CONSTRUCTION MATERIALS<br>(cont'd)<br>建築物料(續上) | Repair mortar  | Making of test cubes<br><br>Curing of test specimens<br><br>Compressive strength of test cubes in the force range 20 kN - 2500 kN<br><br>Trial mixes for polymer modified mortar<br><br>Bond strength of mortars on concrete (pull-off test) | In-house method MOR-CAS-CUB<br><br>HKHA MTS (97/99) Specification Part D Cl. 2.1.1<br><br>HKHA MTS (97/99) Specification Part D Cl. 2.1.1<br><br>HKHA MTS (97/99) Specification Part D Cl. 2.1.20<br><br>HKHA MTS (00/02) Specification Part D Cl. 2.1.15 (method 1) (50 mm and 75 mm diameters) |
|  | Repair mortar<br>(Site tests)                                      | Flow<br><br>Repair mortar inspection core<br><br>Bond strength of mortars on concrete  | In-house method MOR-PHY-FLOW<br><br>HKHA MTS (00/02) Specification Part D Cl. 2.1.22<br><br>HKHA MTS (00/02) Specification Part D Cl. 2.1.15 (method 1)  |
|  | Rock   | Point load test  | ISRM : 1985<br>Suggested method for determining point load strength<br><br>ASTM D 5731 – 95 Standard Test Method for Determination of the Point Load Strength Index of Rock.   |
|  | Soil   | Determination of moisture content by oven-drying at 45°C±5°C   | GEO Report No. 36 : 1994 Test 2.3.2B<br>GEOSPEC 3 : 2001 Test 5.1  |
|  |  | Determination of moisture content by oven-drying at 105°C±5°C  | GEO Report No. 36 : 1994 Test 2.3.2A<br>GEOSPEC 3 : 2001 Test 5.2  |
|  |  | Comparative test for the determination of moisture content by oven-drying  | GEO Report No. 36 : 1994 Test 2.3.2 C<br>GEOSPEC 3 : 2001 Test 5.3   |
|  |  | Determination of liquid limit by cone penetrometer method  | GEO Report No. 36 : 1994 Test 2.4.3  |
|  |  | Determination of plastic limit, plasticity index and liquidity index   | GEO Report No. 36 : 1994 Test 2.5.3  |
|  | Determination of liquid limit, plastic limit, and plasticity index | GEOSPEC 3 : 2001 Test 6.1  |  |
|  | Determination of liquidity index                                   | GEOSPEC 3 : 2001 Test 6.2  |  |

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|--|---|---|---|
| CONSTRUCTION MATERIALS<br>(cont'd)<br>建築物料(續上) | Soil<br>(cont'd)                                  | <p>Determination of particle density by gas jar method</p> <p>Determination of particle density by small pyknometer method</p> <p>Determination of particle size distribution by wet sieving (with dispersant)</p> <p>Determination of particle size distribution by wet sieving (without dispersant)</p> <p>Determination of particle size distribution by the hydrometer (with dispersant)</p> <p>Determination of particle size distribution by the hydrometer method (without dispersant)</p> <p>Construction of a continuous particle size distribution curve from the results of wet-sieving and sedimentation tests</p> <p>Determination of the dry density/moisture content relationship of soils containing particles which are not susceptible to crushing (using a 1000cc mould and 2.5 kg rammer)</p> <p>Determination of the dry density/moisture content relationship of soils containing particles which are susceptible to crushing (using a 1000cc mould and 2.5 kg rammer)</p> <p>Determination of the dry density/moisture content relationship of soils containing particles which are not susceptible to crushing (using a CBR mould and 2.5 kg rammer)</p> <p>Determination of the dry density/moisture content relationship of soils containing particles which are susceptible to crushing (using a CBR mould and 2.5 kg rammer)</p> <p>Determination of the dry density/moisture content relationship of soils containing particles which are not susceptible to crushing (using a 1000cc mould and 4.5 kg rammer)</p> | <p>BS 1377 : Part 2: 1990 Cl. 8.2<br/>GEOSPEC 3 : 2001 Test 7.1</p> <p>GEOSPEC 3 : 2001 Test 7.2</p> <p>GEO Report No. 36 : 1994 Test 2.9.2A<br/>GEOSPEC 3 : 2001 Test 8.1</p> <p>GEO Report No. 36 : 1994 Test 2.9.2B<br/>GEOSPEC 3 : 2001 Test 8.2</p> <p>GEO Report No. 36 : 1994 Test 2.9.5A<br/>GEOSPEC 3 : 2001 Test 8.5</p> <p>GEO Report No. 36 : 1994 Test 2.9.5B<br/>GEOSPEC 3 : 2001 Test 8.6</p> <p>GEO Report No. 36 : 1994 Test 2.9.6<br/>GEOSPEC 3 : 2001 Test 8.7</p> <p>GEO Report No. 36 : 1994 Test 4.3.3A<br/>GEOSPEC 3 : 2001 Test 10.1</p> <p>GEO Report No. 36 : 1994 Test 4.3.3B<br/>GEOSPEC 3 : 2001 Test 10.2</p> <p>GEO Report No. 36 : 1994 Test 4.3.4A<br/>GEOSPEC 3 : 2001 Test 10.3</p> <p>GEO Report No. 36 : 1994 Test 4.3.4B<br/>GEOSPEC 3 : 2001 Test 10.4</p> <p>GEOSPEC 3 : 2001 Test 10.5</p> |

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|--|---|--|---|
| CONSTRUCTION MATERIALS<br>(cont'd)<br>建築物料(續上) | Soil<br>(cont'd)                                  | <p>Determination of the dry density/moisture content relationship of soils containing particles which are susceptible to crushing (using a 1000cc mould and 4.5 kg rammer)</p> <p>Determination of the dry density/moisture content relationship of soils containing particles which are not susceptible to crushing (using a CBR mould and 4.5 kg rammer)</p> <p>Determination of the dry density/moisture content relationship of soils containing particles which are susceptible to crushing (using a CBR mould and 4.5 kg rammer)</p> <p>Determination of the in situ bulk density and in situ dry density of soil by the sand replacement method suitable for fine- and Medium-grained soils<br/>(with small pouring cylinder)</p> <p>Determination of the in situ bulk density and in situ dry density of soil by the sand replacement method suitable for fine-, Medium-, and coarse-grained soils<br/>(with large pouring cylinder)</p> <p>Determination of relative compaction of fill material</p> <p>Determination of the California Bearing Ratio (CBR)</p> <p>The one-dimensional consolidation test</p> <p>The isotropic compression test in a triaxial cell</p> <p>The unconsolidated undrained triaxial compression test without pore pressure measurement</p> <p>The isotropically consolidated undrained triaxial compression test with pore pressure measurement</p> <p>The isotropically consolidated drained triaxial compression test with measurement of volume change</p> | <p>GEOSPEC 3 : 2001 Test 10.6</p> <p>GEOSPEC 3 : 2001 Test 10.7</p> <p>GEOSPEC 3 : 2001 Test 10.8</p> <p>GEO Report No. 36 : 1994 Test 9.2.1<br/>GEOSPEC 3 : 2001 Test 11.1</p> <p>GEO Report No. 36 : 1994 Test 9.2.2<br/>GEOSPEC 3 : 2001 Test 11.2</p> <p>GEOSPEC 3 : 2001 Test 11.4<br/>PNAP 55 : 1994, Cl. 2 of Appendix A</p> <p>GEOSPEC 3 : 2001 Test 12.1</p> <p>GEOSPEC 3 : 2001 Test 14.1</p> <p>GEOSPEC 3 : 2001 Test 14.2</p> <p>GEOSPEC 3 : 2001 Test 15.1</p> <p>GEOSPEC 3 : 2001 Test 15.2</p> <p>GEOSPEC 3 : 2001 Test 15.3</p> |



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|--|---|---|--|
| CONSTRUCTION MATERIALS<br>(cont'd)<br>建築物料(續上) | Soil<br>(Chemical analysis)                       | Total sulphate content  | GEO Report 36 Test 3.5.5<br>GEOSPEC 3 : 2001 Test 9.3  |
|  |   | Water-soluble sulphate content  | GEO Report 36 Test 3.5.5<br>GEOSPEC 3 : 2001 Test 9.3  |
|  |   | Organic matter content  | GEOSPEC 3 : 2001 Test 9.1  |
|  |   | Loss-on-ignition  | GEOSPEC 3 : 2001 Test 9.2  |
|  |   | Water-soluble chloride content  | GEOSPEC 3 : 2001 Test 9.4  |
|  |   | pH value  | GEOSPEC 3 : 2001 Test 9.5  |
|  |   | Tensile test of grey (flake graphite) cast iron   | BS EN 1561 : 1997 Cl. 7.2 &<br>BS 1452 : 1990 Cl. 4  |
|  | Steel   | Mass determination & loading test of manhole covers, gully gratings & kerb overflow weirs | BS EN 124 : 1994, Cl. 8 (AMD 8587)<br>General specification for civil engineering works :<br>1992: Cl. 5.94 (2) and Appendix 5.3<br>HKHA building works specification library : 2000<br>: Cl. DIS 3.T430.3 to Cl. DIS 3.T480.3 |
|  | Steel<br>(reinforcing)                            | Tensile strength tests on hot rolled bars in the force range 2 kN – 2500 kN               | BS 4449 : 1978 (AMD 3010 & 3559)<br>BS 4449 : 1978 (AMD 3010 & 3559)<br>with modifications<br>BS 4449 : 1978 (AMD 3010, 3559, 4337 & 4540)<br>with modifications<br>BS 4449 : 1988   |
|  |   | Tensile strength tests on carbon steel bars in the force range 2 kN – 2500 kN             | CS 2 : 1995  |
|  |   | Bend tests on hot rolled bars   | BS 4449 : 1978 (AMD 3010 & 3559)<br>with modifications<br>BS 4449 : 1978 (AMD 3010, 3559, 4337 & 4540)<br>with modifications<br>BS 4449 : 1988   |
|  |   | Bend tests on carbon steel bars   | CS 2 : 1995  |
|  |   | Rebend tests on hot rolled bars   | BS 4449 : 1978 (AMD 3010 & 3559)<br>BS 4449 : 1978 (AMD 3010, 3559, 4337 & 4540)<br>BS 4449 : 1988   |
| Rebend tests on carbon steel bars              |   | CS 2 : 1995   |  |

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| TEST CATEGORY<br>試驗類別                          | ITEMS, MATERIALS OR PRODUCTS TESTED<br>試驗項目、物料或產品 | SPECIFIC TESTS OR PROPERTIES MEASURED<br>特定試驗或量度的特性   | SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED<br>規範、標準方法或應用技術  |
|--|---|---|---|
| CONSTRUCTION MATERIALS<br>(cont'd)<br>建築物料(續上) | Steel<br>(reinforcing)<br>(cont'd)                | <p>Rebend tests on cold reduced wire</p> <p>Mass per unit length of cold reduced steel wires</p> <p>Tensile strength tests on cold reduced wire in the force range 2 kN – 2500 kN</p> <p>Mass per unit area, pitch and dimension of steel fabric</p> <p>Tensile strength tests on steel fabric in the force range 2 kN – 2500 kN</p> <p>Weld tests on steel fabric</p> <p>Tensile testing of high tensile alloy steel bars in the force range 2 kN – 2500 kN</p> <p>Tensile testing of high tensile steel wire and strand in the force range 2 kN – 2500 kN</p> <p>Tensile test of reinforcing bar with mechanical coupler in the force range 2 kN – 2500 kN</p> <p>Performance test of tension bonded epoxy coated carbon steel bars</p> | <p>BS 4482 : 1985 with modification</p> <p>BS 4482 : 1985</p> <p>BS 4482 : 1985 with modification</p> <p>BS 4483 : 1985</p> <p>BS 4483 : 1985</p> <p>BS 4483 : 1985</p> <p>BS 4486 : 1980 Cl. 9</p> <p>BS 5896 : 1980</p> <p>BS 8110 : Part 1 : 1985 Cl. 3.12.8.16.2<br/>BS 8110 : Part 1 : 1997 Cl. 3.12.8.16.2<br/>In-house method STL-COUPLER-ELG</p> <p>General Specification for Civil Engineering Works<br/>Volume 2 : 1992 edition : Clause 15.33</p> <p>KCRC West Rail Standard, Volume 2, Structural :<br/>January 1999 edition : Clause 23.10.05</p> <p>Materials and Workmanship Specification for Civil<br/>Engineering Works of MTRC : Clause 10.22</p> <p>BS 7295 : Part 1 : 1990, Cl. 4 (AMD 6955)<br/>with modification<br/>BS 3900 : Part C5 : 1975/1992 (Method 6)</p> <p>ASTM A775M-90</p> <p>M &amp; W Specification for Civil Engineering Works of<br/>MTRC : 1997, Cl. 10.23(1)</p> <p>KCRC West Rail Standard Specification :<br/>WR-SPC-S-0023, Cl. 23.10.04</p> <p>HKHA Building Works Specification Library : 1998,<br/>Cl. CON 3.T450.2 &amp; Cl. CON 3.T460.2</p> |

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|--|---|--|--|
| CONSTRUCTION MATERIALS<br>(cont'd)<br>建築物料(續上) | Steel<br>(structural)                             | Tensile strength tests on weldable structural steel sections in the force range 2 kN -2500 kN                    | BS 4360 : 1986<br>BS 4360 : 1990                                 |
|  |   | Charpy Impact Test on metallic materials using V-notch test pieces   | BS EN 10045-1 : 1990   |
|  |   | Charpy Impact Test on metallic materials using U-notch test pieces   | BS EN 10045-1 : 1990   |
|  |   | Brinell hardness test on metallic materials up to the limit of 650 HBW   | BS EN ISO 6506 : Part 1 : 1999                                   |
|  |   | Rockwell hardness test for metallic materials  | BS EN ISO 6508-1 : 1999  |
|  |   | Vickers hardness test on metallic materials in scale range of HV1 to HV30  | BS EN ISO 6507 : Part 1 : 1998<br>BS 427 : 1990                  |
|  |   | Vickers hardness test on hard metals in scale range of HV1 to HV30   | BS EN 23878 : 1993   |
|  |   | Vickers hardness test of fusion welded joint in scale range of HV5 and HV10                                      | BS EN 1043 : Part 1 :1996  |
|  | Tile  | Pull-off test on tile  | In-house Method PULL.TILE  |
|  | Water   | Tests to determine suitability of water for making concrete<br>(Initial setting time, Compressive strength)      | BS 3148 : 1980   |
|  | Water<br>(Chemical analysis)                      | Total solids dried at 103-105°C  | In-house Method WTR-CML-TM Section 8<br>(Gravimetric)            |
|  |   | Total dissolved solid dried at 180°C   | In-house Method WTR-CML-TM Section 9<br>(Gravimetric)            |
|  |   | Chloride content   | In-house Method WTR-CML-TM Section 4<br>(Titrimetric)            |
|  | Sulphate content                                  | In-house Method WTR-CML-TM Section 5<br>(Turbidimetric)<br>GEO Report 36 Test 3.5.5<br>GEOSPEC 3 : 2001 Test 9.3 |  |
|  | Alkalinity  | In-house Method WTR-CML-TM Section 6<br>(Titrimetric)  |  |

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|--|---|---|---|
| CONSTRUCTION MATERIALS<br>(cont'd)<br>建築物料(續上) | <p>Water<br/>(Chemical analysis)<br/>(cont'd)</p> <p>Welds<br/>(Non-destructive tests)</p> <p>Welds<br/>(Destructive tests)</p> | <p>pH value</p> <p>Acid-soluble alkali content</p> <p>Magnetic particle flaw detection</p> <p>Magnetic particle examination of welds</p> <p>Ultrasonic examination of welds<br/>(manual examination)</p> <p>Radiographic examination of fusion welded butt joints in steel</p> <p>Penetrant flaw detection</p> <p>Penetrant testing</p> <p>Macroscopic and microscopic examination on welds in metallic materials</p> <p>Visual inspection of fusion weld</p> <p>Bend test on welds in metallic materials</p> <p>Fracture test on welds in metallic materials</p> <p>Transverse tensile test on welds in metallic materials</p> <p>Longitudinal tensile test on weld metal in fusion welded joints</p> <p>Impact tests on welds in metallic materials</p> | <p>In-house Method WTR-CML-TM Section 7<br/>(Electrode)</p> <p>In-house Method WTR-CML-Na-K</p> <p>BS 6072 : 1981 (1986)<br/>(Magnetic flow method colour contrast technique using permanent magnets, D.C. and A.C. yokes)</p> <p>BS EN 1290 : 1998<br/>(Magnetic flow method colour contrast technique using permanent magnets, D.C. and A.C. yokes)</p> <p>BS 3923 : Part 1 : 1986<br/>(Butt welds in plates &amp; pipes, and node welds)</p> <p>BS EN 1714 : 1998<br/>(Butt welds in plates &amp; pipes, and node welds)</p> <p>BS 2600 : Part 1 : 1983<br/>(X-Ray and Gamma Ray)</p> <p>BS 6443 : 1984<br/>(Colour contrast method)</p> <p>BS EN 571-1 : 1997<br/>(Colour contrast method)</p> <p>BS EN 1321 : 1997</p> <p>BS EN 970 : 1997<br/>BS 5289 : 1976</p> <p>BS EN 910 : 1996</p> <p>BS EN 1320 : 1997</p> <p>BS EN 895 : 1995 with modification</p> <p>BS EN 876 : 1995 with modification</p> <p>BS EN 875 : 1995</p> |

