**Stanger Asia Limited**
史達嘉亞洲有限公司

| | | |
|---|---|---|
| **ADDRESS**<br>地址 | : | Rooms 503 - 504, 5/F. & 705 - 706, 7/F., Fuk Shing Commercial Building, 28 On Lok Mun Street, On Lok Tsuen, Fanling, New Territories, Hong Kong<br>香港新界粉嶺安樂村安樂門街 28 號福成商業大廈 5 樓 503 - 504 室及 7 樓 705 - 706 室 |
| **ENQUIRY**<br>查詢 | : | Ms Jessica Mak Yee-ha, Contract Administration Manager<br>麥綺霞女士 |
| **TELEPHONE**<br>電話 | : | 2682 1203 |
| **FAX**<br>傳真 | : | 2682 0046 |
| **E-MAIL**<br>電郵 | : | stanger@stanger.com.hk |
| **WEBSITE ADDRESS**<br>網址 | : | www.stanger.com.hk |
| **CLIENTELE**<br>服務對象 | : | Public<br>公眾 |

**Stanger Asia Limited**
史達嘉亞洲有限公司

**ADDRESS**
**地址**

| | | |
|---|---|---|
| **Main Laboratory** | : | Rooms 503 - 504, 5/F. & 705 - 706, 7/F., Fuk Shing Commercial Building, 28 On Lok Mun Street, On Lok Tsuen, Fanling, New Territories, Hong Kong<br>香港新界粉嶺安樂村安樂門街 28 號福成商業大廈 5 樓 503 - 504 室及 7 樓 705 - 706 室 |
| **Branch Laboratory** | : | DD 83 Lot 549, 553, 556 Sha Tau Kok Road, Fanling, New Territories, Hong Kong<br>香港新界粉嶺沙頭角公路 83 區 549, 553 及 556 地段 |
| **ACCREDITED TEST CATEGORIES**<br>**認可測試類別** | : | Calibration Services 校正服務<br>Construction Materials 建築材料 |

**Stanger Asia Limited**

史達嘉亞洲有限公司

Rooms 503 - 504, 5/F. & 705 - 706, 7/F., Fuk Shing Commercial Building,
28 On Lok Mun Street, On Lok Tsuen, Fanling, New Territories, Hong Kong
香港新界粉嶺安樂村安樂門街 28 號福成商業大廈 5 樓 503 - 504 室及 7 樓 705 - 706 室

## Calibration Services 校正服務

| ITEM TESTED OR MEASURED<br>測試或量度項目 | SPECIFIC TEST OR PROPERTY MEASURED[@]<br>特定測試或量度的特性[@] | CALIBRATION AND MEASUREMENT CAPABILITY (CMC)*<br>校準和測量能力* |
|---|---|---|
| Construction materials testing equipment | | |
| - Compacting bar | Verification for following parameters<br>in accordance with in-house procedure CAL120<br>for requirements in<br>CS 1: 1990: Vol. 1 (Amd. 1102) App. A9, or<br>CS 1: 2010: Vol. 1 App. A10 | |
| | Dimensions of ramming face: 25 mm x 25 mm | 0.06 mm |
| | Length: 380 mm | 0.67 mm |
| | Mass: 1.8 kg | 0.7 g |
| - Concrete test cube mould | Verification for following parameters<br>in accordance with in-house procedure CAL006<br>for requirements in<br>CS 1: 1990: Vol. 1 App. A21 (excluding<br>surface texture measurement), or<br>CS 1: 2010: Vol. 1 App. A25 | |
| | Dimensions: 100 mm or 150 mm | 0.06 mm |
| | Thickness of base plate: minimum 10 mm | 0.06 mm |
| | Flatness: not more than 0.03 mm or 0.06 mm | 0.01 mm |
| | Squareness / Perpendicularity: 0.5 mm | 0.02 mm |
| | Parallelism: 1 mm | 0.09 mm |
| - Curing tank | On-site verification for following parameter<br>in accordance with<br>in-house procedure CAL096H<br>for requirements in<br>CS1: 1990: Vol. 1 App. A24, or<br>CS1: 2010: Vol. 1 App. A28 | |
| | - temperature distribution at a range of<br>(27 ± 3) ℃ | 0.5 ºC |
| | On-site verification for following parameter<br>in accordance with<br>in-house procedure CAL095H<br>for requirements in<br>CS1: 1990: Vol. 1 App. A24, or<br>CS1: 2010: Vol. 1 App. A28 | |
| | - efficiency of circulation | 33 s |

[@] Unless otherwise specified, accredited activities are conducted at the laboratory.

* 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.

**Stanger Asia Limited**

史達嘉亞洲有限公司

Rooms 503 - 504, 5/F. & 705 - 706, 7/F., Fuk Shing Commercial Building,
28 On Lok Mun Street, On Lok Tsuen, Fanling, New Territories, Hong Kong
香港新界粉嶺安樂村安樂門街 28 號福成商業大廈 5 樓 503 - 504 室及 7 樓 705 - 706 室

## Calibration Services 校正服務

| ITEM TESTED OR MEASURED<br>測試或量度項目 | SPECIFIC TEST OR PROPERTY MEASURED[@]<br>特定測試或量度的特性[@] | CALIBRATION AND MEASUREMENT CAPABILITY (CMC)*<br>校準和測量能力* |
|---|---|---|
| Construction materials testing equipment (cont'd) | | |
| - Slump cone | Verification for following parameters in accordance with in-house procedure CAL014 for requirements in CS1: 1990 Vol. 1 (AMD 1102) App. A4, or CS1: 2010 Vol. 1 App. A5 | |
| | Internal diameter of base: 200 mm | 0.20 mm |
| | Internal diameter of top: 100 mm | 0.20 mm |
| | Height: 300 mm | 0.70 mm |
| | Wall thickness: minimum 1.5 mm | 0.05 mm |
| - Tamping rod | Verification for following parameters in accordance with in-house procedure CAL014 for requirements in CS1: 1990 Vol. 1 (AMD 1102) App. A5, or CS1: 2010 Vol. 1 App. A6 | |
| | Diameter: 16 mm | 0.05 mm |
| | Length: 600 mm | 0.70 mm |

[@] Unless otherwise specified, accredited activities are conducted at the laboratory.

* 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.

**Stanger Asia Limited**

史達嘉亞洲有限公司

Rooms 503 - 504, 5/F. & 705 - 706, 7/F., Fuk Shing Commercial Building,
28 On Lok Mun Street, On Lok Tsuen, Fanling, New Territories, Hong Kong
香港新界粉嶺安樂村安樂門街 28 號福成商業大廈 5 樓 503 - 504 室及 7 樓 705 - 706 室

## Calibration Services 校正服務

| ITEM TESTED OR MEASURED<br>測試或量度項目 | SPECIFIC TEST OR PROPERTY MEASURED[@]<br>特定測試或量度的特性[@] | CALIBRATION AND MEASUREMENT CAPABILITY (CMC)*<br>校準和測量能力* |
|---|---|---|
| Length and related quantities | | |
| - Length | | |
| - Caliper | Calibration for length in accordance with in-house procedure CAL-2004 over the following range : | |
| | 1 mm to 300 mm | 0.02 mm |
| - Dial gauge (bezel diameter: 25 mm - 75 mm) | Calibration for length in accordance with AS 2103: 1978 Cl. 2.4.4 and App. A5 over the following range : | |
| | 0.01 mm to 13 mm | 5.0 µm |
| | above 13 mm to 25 mm | 5.8 µm |
| | above 25 mm to 50 mm | 5.9 µm |
| | above 50 mm to 80 mm | 6.0 µm |
| | above 80 mm to 100 mm | 6.1 µm |
| - Dial gauge (bezel diameter: 47.6 mm - 63.5 mm) | Calibration for length in accordance with BS 907: 2008 + Corr 1: 2009 Annex B3 over the following range : | |
| | 0.01 mm to 13 mm | 5.0 µm |
| | above 13 mm to 25 mm | 5.8 µm |
| | above 25 mm to 50 mm | 5.9 µm |
| | above 50 mm to 80 mm | 6.0 µm |
| | above 80 mm to 100 mm | 6.1 µm |
| - Dial gauge (bezel diameter: 28 mm - 115 mm) | Calibration for length in accordance with BS EN ISO 463: 2006 Annex C over the following range : | |
| | 0.01 mm to 13 mm | 5.0 µm |
| | above 13 mm to 25 mm | 5.8 µm |
| | above 25 mm to 50 mm | 5.9 µm |
| | above 50 mm to 80 mm | 6.0 µm |
| | above 80 mm to 100 mm | 6.1 µm |

[@] Unless otherwise specified, accredited activities are conducted at the laboratory.

* 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.

**Stanger Asia Limited**

史達嘉亞洲有限公司

Rooms 503 - 504, 5/F. & 705 - 706, 7/F., Fuk Shing Commercial Building,
28 On Lok Mun Street, On Lok Tsuen, Fanling, New Territories, Hong Kong
香港新界粉嶺安樂村安樂門街 28 號福成商業大廈 5 樓 503 - 504 室及 7 樓 705 - 706 室

## Calibration Services 校正服務

| ITEM TESTED OR MEASURED<br>測試或量度項目 | SPECIFIC TEST OR PROPERTY MEASURED[@]<br>特定測試或量度的特性[@] | CALIBRATION AND MEASUREMENT CAPABILITY (CMC)*<br>校準和測量能力* |
|---|---|---|
| Length and related quantities | | |
| - Length | | |
| - Dial gauge<br>(bezel diameter: 28 mm - 115 mm) | Calibration for length in accordance with JIS B 7503: 2017 Annex JA Table JA.1 (based on English version provided by JSA in July 2017), without checking measuring force, over the following range : | |
| | 0.01 mm to 13 mm | 5.0 µm |
| | above 13 mm to 25 mm | 5.8 µm |
| | above 25 mm to 50 mm | 5.9 µm |
| | above 50 mm to 80 mm | 6.0 µm |
| | above 80 mm to 100 mm | 6.1 µm |
| - Dial gauge | Calibration for length in accordance with in-house procedure CAL-2001 in both increasing and decreasing increment at customer specified calibration points over the following range : | |
| | 0.01 mm to 13 mm | 5.0 µm |
| | above 13 mm to 25 mm | 5.8 µm |
| | above 25 mm to 50 mm | 5.9 µm |
| | above 50 mm to 80 mm | 6.0 µm |
| | above 80 mm to 100 mm | 6.1 µm |
| | Calibration for length in accordance with in-house procedure CAL-2002 in increasing increment at customer specified calibration points over the following range : | |
| | 0.01 mm to 13 mm | 5.0 µm |
| | above 13 mm to 25 mm | 5.8 µm |
| | above 25 mm to 50 mm | 5.9 µm |
| | above 50 mm to 80 mm | 6.0 µm |
| | above 80 mm to 100 mm | 6.1 µm |

[@] Unless otherwise specified, accredited activities are conducted at the laboratory.

* 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.

**Stanger Asia Limited**

史達嘉亞洲有限公司

Rooms 503 - 504, 5/F. & 705 - 706, 7/F., Fuk Shing Commercial Building,
28 On Lok Mun Street, On Lok Tsuen, Fanling, New Territories, Hong Kong
香港新界粉嶺安樂村安樂門街 28 號福成商業大廈 5 樓 503 - 504 室及 7 樓 705 - 706 室

## Calibration Services 校正服務

| ITEM TESTED OR MEASURED<br>測試或量度項目 | SPECIFIC TEST OR PROPERTY MEASURED[@]<br>特定測試或量度的特性[@] | CALIBRATION AND MEASUREMENT CAPABILITY (CMC)*<br>校準和測量能力* |
|---|---|---|
| Length and related quantities | | |
| - Length | | |
| - Digital indicator | Calibration for length in accordance with GEOSPEC 3: 2001 App. A.3.4.2 over the following ranges : | |
| | 0.01 mm to 13 mm | 1.5 µm |
| | above 13 mm to 50 mm | 5.1 µm |
| | Calibration for length in accordance with in-house method CAL310-1 over the following ranges : | |
| | 0.01 mm to 13 mm | 1.5 µm |
| | above 13 mm to 50 mm | 5.1 µm |
| - Dip Meter | Calibration for length in accordance with in-house procedure CAL-2006 over the following range : | |
| | 1 m to 200 m | 2.4 mm per 5 m |
| - Engineer's steel measuring rule | Calibration for length in accordance with in-house procedure CAL-2003 over the following ranges : | |
| | 200 mm to 1000 mm | 0.4 mm |
| - Linear displacement transducer (LVDT) | Calibration for length in accordance with GEOSPEC 3: 2001 App. A.3.4.2 over the following range : | |
| | 0.01 mm to 100 mm | 0.008 mm |

[@] Unless otherwise specified, accredited activities are conducted at the laboratory.

* 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.

**Stanger Asia Limited**

史達嘉亞洲有限公司

Rooms 503 - 504, 5/F. & 705 - 706, 7/F., Fuk Shing Commercial Building,
28 On Lok Mun Street, On Lok Tsuen, Fanling, New Territories, Hong Kong
香港新界粉嶺安樂村安樂門街 28 號福成商業大廈 5 樓 503 - 504 室及 7 樓 705 - 706 室

## Calibration Services 校正服務

| ITEM TESTED OR MEASURED<br>測試或量度項目 | SPECIFIC TEST OR PROPERTY MEASURED[@]<br>特定測試或量度的特性[@] | CALIBRATION AND MEASUREMENT CAPABILITY (CMC)*<br>校準和測量能力* |
|---|---|---|
| Length and related quantities | | |
| - Length | | |
| - Measuring tape | Calibration for length in accordance with in-house procedure CAL-2005 over the following range : | |
| | 1 m to 200 m | 1.7 mm per 5 m |

[@] Unless otherwise specified, accredited activities are conducted at the laboratory.

* 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.

**Stanger Asia Limited**

史達嘉亞洲有限公司

Rooms 503 - 504, 5/F. & 705 - 706, 7/F., Fuk Shing Commercial Building,
28 On Lok Mun Street, On Lok Tsuen, Fanling, New Territories, Hong Kong
香港新界粉嶺安樂村安樂門街 28 號福成商業大廈 5 樓 503 - 504 室及 7 樓 705 - 706 室

## Calibration Services 校正服務

| ITEM TESTED OR MEASURED<br>測試或量度項目 | SPECIFIC TEST OR PROPERTY MEASURED[@]<br>特定測試或量度的特性[@] | CALIBRATION AND MEASUREMENT CAPABILITY (CMC)*<br>校準和測量能力* |
|---|---|---|
| Mass and related quantities | | |
| - Force | | |
| - Load cell | Calibration for compressive force<br>in accordance with in-house method CAL1006<br>over the following ranges : | |
| | 1 kN to 120 kN | 1.0 % of reading |
| | above 120 kN to 520 kN | 0.7 % of reading |
| | Calibration for compressive force<br>In accordance with GEOPEC 3: 2001 App. A.3.1<br>over the following ranges : | |
| | 1 kN to 120 kN | 1.0 % of reading |
| | above 120 kN to 500 kN | 0.7 % of reading |
| | Calibration for compressive force<br>in accordance with in-house method CAL1007-1<br>over the following ranges : | |
| | 1 kN to 120 kN | 1.0 % of reading |
| | above 120 kN to 500 kN | 0.7 % of reading |

[@] Unless otherwise specified, accredited activities are conducted at the laboratory.

* 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.

**Stanger Asia Limited**

史達嘉亞洲有限公司

Rooms 503 - 504, 5/F. & 705 - 706, 7/F., Fuk Shing Commercial Building,
28 On Lok Mun Street, On Lok Tsuen, Fanling, New Territories, Hong Kong
香港新界粉嶺安樂村安樂門街 28 號福成商業大廈 5 樓 503 - 504 室及 7 樓 705 - 706 室

## Calibration Services 校正服務

| ITEM TESTED OR MEASURED<br>測試或量度項目 | SPECIFIC TEST OR PROPERTY MEASURED@<br>特定測試或量度的特性@ | CALIBRATION AND MEASUREMENT CAPABILITY (CMC)*<br>校準和測量能力* |
|---|---|---|
| Mass and related quantities (cont'd) | | |
| - Force (cont'd) | | |
| - Proving ring | Calibration for compressive force<br>in accordance with<br>GEOSPEC 3: 2001 App. A.3.1<br>over the following ranges : | |
| | 1 kN to 2 kN | 0.9 % of reading |
| | above 2 kN to 10 kN | 0.5 % of reading |
| | above 10 kN to 50 kN | 0.8 % of reading |
| | Calibration for compressive force<br>in accordance with in-house method CAL1007-1<br>over the following ranges : | |
| | 1 kN to 2 kN | 0.9 % of reading |
| | above 2 kN to 10 kN | 0.5 % of reading |
| | above 10 kN to 50 kN | 0.8 % of reading |
| - Pull-off equipment | Calibration for tensile force<br>in accordance with in-house method CAL1002<br>over the following ranges : | |
| | 1 kN to 2 kN | 1.2 % of reading |
| | above 2 kN to 4 kN | 0.7 % of reading |
| | above 4 kN to 10 kN | 0.4 % of reading |

@ Unless otherwise specified, accredited activities are conducted at the laboratory.

* 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.

**Stanger Asia Limited**

史達嘉亞洲有限公司

Rooms 503 - 504, 5/F. & 705 - 706, 7/F., Fuk Shing Commercial Building,
28 On Lok Mun Street, On Lok Tsuen, Fanling, New Territories, Hong Kong
香港新界粉嶺安樂村安樂門街 28 號福成商業大廈 5 樓 503 - 504 室及 7 樓 705 - 706 室

| Calibration Services 校正服務 | | |
|---|---|---|
| **ITEM TESTED OR MEASURED**<br>測試或量度項目 | **SPECIFIC TEST OR PROPERTY MEASURED@**<br>特定測試或量度的特性@ | **CALIBRATION AND MEASUREMENT CAPABILITY (CMC)***<br>校準和測量能力* |
| Mass and related quantities (cont'd) | | |
| - Hardness | | |
| - Hardness testing machine | On-site indirect verification for testing machine for Vickers hardness scale in accordance with BS EN ISO 6507: Part 2: 1998 over the following range : | |
| | 150 HV30 to 750 HV30 | 2.6 % HV30 |

@ Unless otherwise specified, accredited activities are conducted at the laboratory.

* 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.

**Stanger Asia Limited**

史達嘉亞洲有限公司

Rooms 503 - 504, 5/F. & 705 - 706, 7/F., Fuk Shing Commercial Building,
28 On Lok Mun Street, On Lok Tsuen, Fanling, New Territories, Hong Kong
香港新界粉嶺安樂村安樂門街 28 號福成商業大廈 5 樓 503 - 504 室及 7 樓 705 - 706 室

## Calibration Services 校正服務

| ITEM TESTED OR MEASURED<br>測試或量度項目 | SPECIFIC TEST OR PROPERTY MEASURED@<br>特定測試或量度的特性@ | CALIBRATION AND MEASUREMENT CAPABILITY (CMC)*<br>校準和測量能力* |
|---|---|---|
| Mass and related quantities (cont'd) | | |
| - Mass | | |
| - Electronic balance | Calibration for mass using following<br>OIML Class standard weights<br>(1) Class F1 weights from 1 g to 10 kg<br>(2) Class F2 weights of 20 kg<br>in accordance with in-house method CAL 001<br>over the following ranges : | |
| | 1 g to 200 g | 0.8 mg |
| | above 200 g to 600 g | 2.4 mg |
| | above 600 g to 3 kg | 9.8 mg |
| | above 3 kg to 10 kg | 46 mg |
| | above 10 kg to 60 kg | 0.81 g |
| | above 60 kg to 70 kg | 5.7 g |
| | On-site calibration for mass using following<br>OIML Class standard weights<br>(1) Class F1 weights from 1 g to 10 kg<br>(2) Class F2 weights of 20 kg<br>in accordance with in-house method CAL 001<br>over the following ranges : | |
| | 1 g to 200 g | 0.8 mg |
| | above 200 g to 600 g | 2.4 mg |
| | above 600 g to 3 kg | 9.8 mg |
| | above 3 kg to 10 kg | 46 mg |
| | above 10 kg to 60 kg | 0.81 g |
| | above 60 kg to 70 kg | 5.7 g |

@ Unless otherwise specified, accredited activities are conducted at the laboratory.

* 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.

**Stanger Asia Limited**
史達嘉亞洲有限公司
Rooms 503 - 504, 5/F. & 705 - 706, 7/F., Fuk Shing Commercial Building,
28 On Lok Mun Street, On Lok Tsuen, Fanling, New Territories, Hong Kong
香港新界粉嶺安樂村安樂門街 28 號福成商業大廈 5 樓 503 - 504 室及 7 樓 705 - 706 室

## Construction Materials 建築材料

| ITEM TESTED OR MEASURED<br>測試或量度項目 | SPECIFIC TEST OR PROPERTY MEASURED<br>特定測試或量度的特性 | SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED<br>規範、標準方法或應用技術 |
|---|---|---|
| Concrete<br>(chemical analysis) | Chloride content | BS EN 14629: 2007 Method A *excluding* Cl. 4.1<br>BS 1881: Part 124: 1988 Cl. 10.2<br>CS 1: 2010 Section 21.10.2 |
| | Chloride content by weight of concrete sample | BS 1881: Part 124: 1988 Cl. 10.2 in conjunction with In-house method CHEM06-S (by calculation)<br>CS 1: 2010 Section 21.10.2 in conjunction with In-house method CHEM06-S (by calculation) |
| | Sulphate content | BS 1881: Part 124: 1988 Cl. 10.3<br>CS 1: 2010 Section 21.10.3 |
| | Sulphate content by weight of concrete sample | BS 1881: Part 124: 1988 Cl. 10.3 in conjunction with In-house method CHEM07-S (by calculation)<br>CS 1: 2010 Section 21.10.3 in conjunction with In-house method CHEM07-S (by calculation) |
| | Cement content<br>(By calcium oxide determination) | BS 1881: Part 124: 1988 Section 5.4 & 5.9 *excluding* Cl. 5.9.4 |
| | Cement and Aggregate content<br>(By calcium oxide determination) | CS 1: 2010 Section 21.6.4, 21.6.6 & 21.6.7 |
| | Aggregate / Cement ratio<br>(By calcium oxide determination) | BS 1881: Part 124: 1988 Section 5.9 *excluding* Cl. 5.9.4 |
| | Detection of PFA | CS 1: 2010 Section 21.5 |
| | pH value | Hong Kong Housing Authority Materials Testing Services Term Contract (2020/2022) for Construction Materials (Package A1) Part D Cl. 1.4.14 |

**Stanger Asia Limited**
史達嘉亞洲有限公司
Rooms 503 - 504, 5/F. & 705 - 706, 7/F., Fuk Shing Commercial Building,
28 On Lok Mun Street, On Lok Tsuen, Fanling, New Territories, Hong Kong
香港新界粉嶺安樂村安樂門街 28 號福成商業大廈 5 樓 503 - 504 室及 7 樓 705 - 706 室

| **Construction Materials 建築材料** | | |
|---|---|---|
| **ITEM TESTED OR MEASURED**<br>測試或量度項目 | **SPECIFIC TEST OR PROPERTY MEASURED**<br>特定測試或量度的特性 | **SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED**<br>規範、標準方法或應用技術 |
| Soil<br>(chemical analysis) | Organic matter content | GEOSPEC 3: 2017 Test 9.1 |
| | Loss-on-ignition (L.O.I) | GEOSPEC 3: 2017 Test 9.2 |
| | Total sulphate content (as $SO_3$) | GEOSPEC 3: 2017 Test 9.3 |
| | Water-soluble sulphate content (as $SO_3$) | GEOSPEC 3: 2017 Test 9.3 |
| | Water-soluble chloride content | GEOSPEC 3: 2017 Test 9.4 |
| | pH value | GEOSPEC 3: 2017 Test 9.5 |
| Ground water<br>(chemical analysis) | Sulphate content (as $SO_3$) | GEOSPEC 3 : 2017 Test 9.3 |
| | pH value | GEOSPEC 3 : 2017 Test 9.5 |

**Stanger Asia Limited**
史達嘉亞洲有限公司
Rooms 503 - 504, 5/F. & 705 - 706, 7/F., Fuk Shing Commercial Building,
28 On Lok Mun Street, On Lok Tsuen, Fanling, New Territories, Hong Kong
香港新界粉嶺安樂村安樂門街 28 號福成商業大廈 5 樓 503 - 504 室及 7 樓 705 - 706 室

## Construction Materials 建築材料

| ITEM TESTED OR MEASURED<br>測試或量度項目 | SPECIFIC TEST OR PROPERTY MEASURED<br>特定測試或量度的特性 | SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED<br>規範、標準方法或應用技術 |
|---|---|---|
| Coating | Mass per unit area of hot-dip galvanized coating by gravimetric method | BS EN ISO 1460: 2020<br>BS EN 10346: 2015 Annex A |
| Metallic materials (non-destructive) | Ultrasonic test of H beams with parallel flanges (manual method) | BS EN 10306: 2002 |
| | Ultrasonic test of metallic materials (reflection method) | BS 5996: 1993<br>BS EN 10160: 1999 |
| Welds (non-destructive) | Liquid penetrant test (Colour contrast method) | BS 6443: 1984 + Amd. 4844<br>BS EN 571: Part 1: 1997<br>BS EN ISO 3452-1: 2013<br>BS EN ISO 3452-1: 2021<br>in conjunction with the following specification(s):<br>BS 5135: 1984 Table 18 & 19<br>BS 5400-6: 1999 Cl. 5.5.2.4.1<br>BS EN ISO 5817: 2003 Table 1<br>BS EN ISO 5817: 2007 Table 1<br>BS EN ISO 5817: 2014 Table 1<br>Buildings Department Code of Practice for the Structural Use of Steel (2011) Table 14.3b |
| | Magnetic particle test (Magnetic flow method colour contrast method using permanent magnets & A.C. yokes) | BS 6072: 1981 + Amd. 3960, 4542 & 4843<br>BS EN 1290: 1998<br>BS EN ISO 9934-1: 2001<br>BS EN ISO 17638: 2009<br>BS EN ISO 17638: 2016<br>in conjunction with the following specification(s):<br>BS 5135: 1984 Table 18 & 19<br>BS 5400-6: 1999 Cl. 5.5.2.4.1<br>BS EN ISO 5817: 2003 Table 1<br>BS EN ISO 5817: 2007 Table 1<br>BS EN ISO 5817: 2014 Table 1<br>Buildings Department Code of Practice for the Structural Use of Steel (2011) Table 14.3b |

**Stanger Asia Limited**
史達嘉亞洲有限公司
Rooms 503 - 504, 5/F. & 705 - 706, 7/F., Fuk Shing Commercial Building,
28 On Lok Mun Street, On Lok Tsuen, Fanling, New Territories, Hong Kong
香港新界粉嶺安樂村安樂門街 28 號福成商業大廈 5 樓 503 - 504 室及 7 樓 705 - 706 室

## Construction Materials 建築材料

| ITEM TESTED OR MEASURED<br>測試或量度項目 | SPECIFIC TEST OR PROPERTY MEASURED<br>特定測試或量度的特性 | SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED<br>規範、標準方法或應用技術 |
|---|---|---|
| Welds (non-destructive)<br>(cont'd) | Radiographic examination<br>(Gamma Ray) | BS EN 1435: 1997<br>in conjunction with the following specification(s):<br>BS 5135: 1984 Table 18 & 19<br>BS 5400-6: 1999 Cl. 5.5.2.4.2<br>BS EN ISO 5817: 2003 Table 1<br>BS EN ISO 5817: 2007 Table 1<br>BS EN ISO 5817: 2014 Table 1<br>Buildings Department Code of Practice for the Structural Use of Steel (2011) Table 14.3b |
| | Ultrasonic test<br>(Butt welds in plates & pipes, 'T' joint welds, nozzle welds & node welds) | BS 3923: Part 1: 1986 (Level 1, 2a, 2b & 3)<br>BS EN 1714: 1998 + Amd. 10286 (Level A, B & C)<br>BS EN ISO 17640: 2010 (Level A, B & C)<br>BS EN ISO 17640: 2018 (Level A, B & C)<br>in conjunction with the following specification(s):<br>BS 5135: 1984 Table 18 & 19<br>BS 5400-6: 1999 Cl. 5.5.2.4.2<br>BS EN ISO 5817: 2003 Table 1<br>BS EN ISO 5817: 2007 Table 1<br>BS EN ISO 5817: 2014 Table 1<br>Buildings Department Code of Practice for the Structural Use of Steel (2011) Table 14.3b |
| | Visual examination | BS 5289: 1976<br>BS EN 970: 1997<br>BS EN ISO 17637: 2011<br>BS EN ISO 17637: 2016<br>in conjunction with the following specification(s):<br>BS 5135: 1984 Table 18 & 19<br>BS 5400-6: 1999 Cl. 5.5.2.4.1<br>BS EN ISO 5817: 2003 Table 1<br>BS EN ISO 5817: 2007 Table 1<br>BS EN ISO 5817: 2014 Table 1<br>Buildings Department Code of Practice for the Structural Use of Steel (2011) Table 14.3b |

**Stanger Asia Limited**
史達嘉亞洲有限公司
Rooms 503 - 504, 5/F. & 705 - 706, 7/F., Fuk Shing Commercial Building,
28 On Lok Mun Street, On Lok Tsuen, Fanling, New Territories, Hong Kong
香港新界粉嶺安樂村安樂門街 28 號福成商業大廈 5 樓 503 - 504 室及 7 樓 705 - 706 室

| **Construction Materials 建築材料** | | |
|---|---|---|
| **ITEM TESTED OR MEASURED**<br>測試或量度項目 | **SPECIFIC TEST OR PROPERTY MEASURED**<br>特定測試或量度的特性 | **SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED**<br>規範、標準方法或應用技術 |
| Welds (non-destructive)<br>(cont'd) | Visual examination and bend test on stud connectors | <Visual examination as follows><br>BS 5289: 1976<br>BS EN 970: 1997<br>BS EN ISO 17637: 2011<br>BS EN ISO 17637: 2016<br><together with the following bend test method(s)><br>BS 5400-6: 1999 Cl. 5.5.4(b)<br>BS EN ISO 14555: 2017 Cl. 11.2, 11.3 (excluding Torque wrench method), 12.2 & 12.3<br>Buildings Department Code of Practice for the Structural Use of Steel (2011) Cl. 14.3.7.3 |

**Stanger Asia Limited**
史達嘉亞洲有限公司
DD 83 Lot 549, 553, 556 Sha Tau Kok Road, Fanling, New Territories, Hong Kong
香港新界粉嶺沙頭角公路 83 區 549, 553 及 556 地段

| **Calibration Services 校正服務** | | |
|---|---|---|
| **ITEM TESTED OR MEASURED**<br>測試或量度項目 | **SPECIFIC TEST OR PROPERTY MEASURED@**<br>特定測試或量度的特性@ | **CALIBRATION AND MEASUREMENT CAPABILITY (CMC)***<br>校準和測量能力* |
| Length and related quantities | | |
| - Length | | |
| - Extensometer | | |
| - Class 1 and Class 2 with gauge length 50 mm to 600 mm | On-site calibration for displacement using calibrating rig and verification of class in accordance with BS EN 10002-4: 1995 over the following range: | |
| | 0.03 mm to 24 mm | 9.8 µm |
| | On-site calibration for displacement using calibrating rig and verification of class in accordance with BS EN ISO 9513: 2002 over the following range: | |
| | 0.03 mm to 24 mm | 9.8 µm |
| | On-site calibration for displacement using calibrating rig and verification of class in accordance with BS EN ISO 9513: 2012 over the following range: | |
| | 0.03 mm to 24 mm | 9.8 µm |
| - Grade B, C, D. E and F for gauge length 50 mm to 600 mm | On-site calibration for displacement using calibrating rig and verification of grade in accordance with BS 3846: 1970 over the following range: | |
| | 0.03 mm to 24 mm | 9.8 µm |

@ Unless otherwise specified, accredited activities are conducted at the laboratory.

* 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.

**Stanger Asia Limited**
史達嘉亞洲有限公司
DD 83 Lot 549, 553, 556 Sha Tau Kok Road, Fanling, New Territories, Hong Kong
香港新界粉嶺沙頭角公路 83 區 549, 553 及 556 地段

| Calibration Services 校正服務 | | |
|---|---|---|
| **ITEM TESTED OR MEASURED**<br>測試或量度項目 | **SPECIFIC TEST OR PROPERTY MEASURED@**<br>特定測試或量度的特性@ | **CALIBRATION AND MEASUREMENT CAPABILITY (CMC)***<br>校準和測量能力* |
| Mass and related quantities | | |
| - Force | | |
| - Load cell | Calibration for compressive force<br>in accordance with in-house method CAL1008<br>over the following ranges : | |
| | 300 kN to 800 kN | 1.1 % of reading |
| | above 800 kN to 6000 kN | 0.8 % of reading |
| | above 6000 kN to 15000 kN | 1.2 % of reading |
| - Load cell with hydraulic jack | Calibration for compressive force<br>in accordance with in-house method CAL1008<br>over the following ranges : | |
| | 300 kN to 500 kN | 2.0 % of reading |
| | above 500 kN to 800 kN | 1.3 % of reading |
| | above 800 kN to 6000 kN | 0.9 % of reading |
| | above 6000 kN to 15000 kN | 1.3 % of reading |

@ Unless otherwise specified, accredited activities are conducted at the laboratory.

* 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.

**Stanger Asia Limited**
史達嘉亞洲有限公司
DD 83 Lot 549, 553, 556 Sha Tau Kok Road, Fanling, New Territories, Hong Kong
香港新界粉嶺沙頭角公路 83 區 549, 553 及 556 地段

## Calibration Services 校正服務

| ITEM TESTED OR MEASURED<br>測試或量度項目 | SPECIFIC TEST OR PROPERTY MEASURED@<br>特定測試或量度的特性@ | CALIBRATION AND MEASUREMENT CAPABILITY (CMC)*<br>校準和測量能力* |
|---|---|---|
| Thermometry | | |
| - Temperature | | |
| - Digital thermometer | Calibration for temperature using water bath<br>in accordance with<br>in-house method CAL450<br>over the following ranges: | |
| | 10 ℃ to 50 ℃ | 0.30 K |
| | above 50 ℃ to 90 ℃ | 0.30 K |
| | Calibration for temperature using drywell<br>in accordance with<br>in-house method CAL450<br>over the following range: | |
| | above 50 ℃ to 350 ℃ | 0.30 K |

@ Unless otherwise specified, accredited activities are conducted at the laboratory.

* 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.

**Stanger Asia Limited**
史達嘉亞洲有限公司
DD 83 Lot 549, 553, 556 Sha Tau Kok Road, Fanling, New Territories, Hong Kong
香港新界粉嶺沙頭角公路 83 區 549, 553 及 556 地段

## Construction Materials 建築材料

| ITEM TESTED OR MEASURED<br>測試或量度項目 | SPECIFIC TEST OR PROPERTY MEASURED<br>特定測試或量度的特性 | SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED<br>規範、標準方法或應用技術 |
|---|---|---|
| Adhesive | Pull-off test of plaster | In-house method DIA 06 |
| | Pull-off test of render | In-house method DIA 02 |
| | Pull-off test of repair mortar | Hong Kong Housing Authority Materials Testing Services (2017/2018) for Maintenance & Building Materials Specification Part D Cl. 2.1.15 Method 1 |
| | Pull-off test of tiles | In-house method DIA 30 (coring method)<br>In-house method DIA 31 (saw-cut method) |
| Coating | Pull-off test of adhesion | In-house method DIA 36 |
| | Pull-off test of coating | BS 3900-E10: 2003 Cl. 9.4.2<br>BS EN ISO 4624: 2003 Cl. 9.4.2<br>BS EN ISO 4624: 2016 Cl. 8.4.2 |
| Concrete | Sampling fresh concrete on site | BS EN 12350-1: 2009<br>CS1: 2010 Section 1 |
| | Slump of fresh concrete | BS EN 12350-2: 2009<br>CS1: 2010 Section 2 Part I |
| | Flow table test | BS 1881: Part 105: 1984<br>CS1: 2010 Section 2 Part IV |
| | Density of compacted fresh concrete | BS EN 12350-6: 2009<br>CS1: 2010 Section 5 |
| | Making test cubes from fresh concrete | BS EN 12390-2: 2009<br>CS1: 2010 Section 7 |
| | Curing of test specimens | CS1: 2010 Section 10 |
| | Compressive strength of concrete cubes<br>in the force range 20 kN - 3000 kN | BS EN 12390-3: 2019<br>CS1: 2010 Section 12 |
| | Obtaining core samples | CS1: 2010 Section 15 |
| | Compressive strength of concrete cores<br>in the force range 20 kN - 2000 kN<br>in the force range 20 kN - 3000 kN | BS EN 12504-1: 2019<br>CS1: 2010 Section 15 |

**Stanger Asia Limited**
史達嘉亞洲有限公司
DD 83 Lot 549, 553, 556 Sha Tau Kok Road, Fanling, New Territories, Hong Kong
香港新界粉嶺沙頭角公路 83 區 549, 553 及 556 地段

| Construction Materials 建築材料 | | |
|---|---|---|
| **ITEM TESTED OR MEASURED**<br>測試或量度項目 | **SPECIFIC TEST OR PROPERTY MEASURED**<br>特定測試或量度的特性 | **SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED**<br>規範、標準方法或應用技術 |
| Concrete<br>(cont'd) | Density of hardened concrete | BS EN 12390-7: 2019<br>CS1: 2010 Section 16 |
| | Water absorption | BS 1881: Part 122: 2011 +A1: 2020 |
| | Removal of concrete cover to expose reinforcement | Hong Kong Housing Authority Materials Testing Services (2017/2018) for Maintenance & Building Materials Specification Part D Cl. 4.2.1 |
| | Cutting out reinforcement | Hong Kong Housing Authority Materials Testing Services (2002/2004) for Maintenance & Building Materials Specification Part D Cl. 4.2.3 |
| | Moisture content by weighing drilling powder | Hong Kong Housing Authority Materials Testing Services (2002/2004) for Maintenance & Building Materials Specification Part D Cl. 4.3.8 Method 1 |
| | Moisture content by weighing minicores | Hong Kong Housing Authority Materials Testing Services (2002/2004) for Maintenance & Building Materials Specification Part D Cl. 4.3.8 Method 2 |
| | Crack survey | Hong Kong Housing Authority Materials Testing Services (2017/2018) for Maintenance & Building Materials Specification Part D Cl. 4.3.14 |
| | Obtaining drilling powder samples | Hong Kong Housing Authority Materials Testing Services (2017/2018) for Maintenance & Building Materials Specification Part D Cl. 6.4 |
| | Heat of hydration monitoring (temperature monitoring of concrete structure) | In-house method CON22 |
| | Temperature rise evaluation test | In-house method CON22-1 |

**Stanger Asia Limited**
史達嘉亞洲有限公司
DD 83 Lot 549, 553, 556 Sha Tau Kok Road, Fanling, New Territories, Hong Kong
香港新界粉嶺沙頭角公路 83 區 549, 553 及 556 地段

## Construction Materials 建築材料

| ITEM TESTED OR MEASURED<br>測試或量度項目 | SPECIFIC TEST OR PROPERTY MEASURED<br>特定測試或量度的特性 | SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED<br>規範、標準方法或應用技術 |
|---|---|---|
| Concrete (diagnostic) | Carbonation test | BS EN 14630: 2006<br>Building Research Establishment Information IP 6/81<br>Hong Kong Housing Authority Materials Testing Services (2017/2018) for Maintenance & Building Materials Specification Part D Cl. 4.3.1 Method 1 & Method 2 |
| | Covermeter survey | BS 1881: Part 204: 1988 + Amd. 6201<br>Hong Kong Housing Authority Materials Testing Services (2017/2018) for Maintenance & Building Materials Specification Part D Cl. 4.3.2 Method 1 & Method 2 |
| | Half-cell potential measurement | ASTM C876-15<br>Hong Kong Housing Authority Materials Testing Services (2017/2018) for Maintenance & Building Materials Specification Part D Cl. 4.3.4 & 4.3.5 |
| | Infrared thermography for detection of building surface defects | Hong Kong Concrete Institute TM1 Issue 2 (2022) |
| | Resistivity measurement | BS 1881: Part 201: 1986 Cl. 2.3<br>Hong Kong Housing Authority Materials Testing Services (2017/2018) for Maintenance & Building Materials Specification Part D Cl. 4.3.6 |
| | Surface hardness measurement | BS EN 12504-2: 2012<br>BS EN 12504-2: 2021 |
| | Surface penetration radar survey | Hong Kong Concrete Institute TM2 (2009) |
| | Ultrasonic pulse velocity measurement (by direct, semi-direct and indirect measurement) | BS 1881: Part 203: 1986<br>BS EN 12504-4: 2021 |

**Stanger Asia Limited**
史達嘉亞洲有限公司
DD 83 Lot 549, 553, 556 Sha Tau Kok Road, Fanling, New Territories, Hong Kong
香港新界粉嶺沙頭角公路 83 區 549, 553 及 556 地段

| Construction Materials 建築材料 | | |
|---|---|---|
| **ITEM TESTED OR MEASURED**<br>測試或量度項目 | **SPECIFIC TEST OR PROPERTY MEASURED**<br>特定測試或量度的特性 | **SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED**<br>規範、標準方法或應用技術 |
| Controlled low strength material | Flowability | ASTM D6103/D6103M-17<br>in conjunction with the following specification(s):<br>Highways Department Guidance Notes on<br>Use of Self-compacting Backfill Material<br>RD/GN/049 (Sep 2022) |
| | Load placement capacity (by ball drop test) | ASTM D6024/D6024M-16<br>in conjunction with the following specification(s):<br>Highways Department Guidance Notes on<br>Use of Self-compacting Backfill Material<br>RD/GN/049 (Sep 2022) |

**Stanger Asia Limited**
史達嘉亞洲有限公司
DD 83 Lot 549, 553, 556 Sha Tau Kok Road, Fanling, New Territories, Hong Kong
香港新界粉嶺沙頭角公路 83 區 549, 553 及 556 地段

| Construction Materials 建築材料 | | |
|---|---|---|
| **ITEM TESTED OR MEASURED**<br>測試或量度項目 | **SPECIFIC TEST OR PROPERTY MEASURED**<br>特定測試或量度的特性 | **SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED**<br>規範、標準方法或應用技術 |
| Foundation | Borehole video inspection test | Hong Kong Housing Authority Materials Testing Services (2023/2025) for Non-destructive Pile Testing Cl. D8 & D10<br>Hong Kong Housing Authority Materials Testing Services (2024/2026) for Non-destructive Pile Testing Cl. D8 & D10 |
| | Compression static loading test (SLT) | Architectural Services Department General Specification for Building (2022) Section 5.29<br>Buildings Department Code of Practice for Foundations (2017) Cl. 8.4<br>General Specification for Civil Engineering Works (2006) Vol. 1 App. 8.1<br>General Specification for Civil Engineering Works (2020) Vol. 1 App. 8.1<br>Hong Kong Housing Authority Specification Library (2022) PIL1.T610.9 to PIL1.T1110.9 |
| | Compression static loading test on pile (SLT) using multiple hydraulic jacks and load cells | Buildings Department Code of Practice for Foundations (2017) Cl. 8.4 with modification<br>General Specification for Civil Engineering Works (2020) Vol. 1 App. 8.1 with modification |
| | Crosshole sonic logging test (SOLT) | ASTM D6760-16 |
| | Pile dynamic test (PDA) | ASTM D4945-17 |
| | Pile integrity test (PIT) | ASTM D5882-16 |
| | Plate load test (PLT) | BS 1377: Part 9: 1990 Cl. 4.1 (incremental loading) excluding Cl. 4.1.6.1<br>Buildings Department Code of Practice for Foundations (Apr 2017) Cl. 8.2(2) excluding 8.2(2)(f) to (h) |
| | Tension static loading test (SLT) | Architectural Services Department, Technical Instruction No. 04/2005 (revision date: Jun 2019) Particular Specification for Tension Piles<br>Buildings Department Code of Practice for Foundations (2017) Cl. 8.10 |
| | Tension static loading test on pile (SLT) using multiple hydraulic jacks and load cells | In-house method STA07 |
| | Ultrasonic echo sounder test (UEST) | Hong Kong Concrete Institute TM3 Issue 2 (2024) |

**Stanger Asia Limited**
史達嘉亞洲有限公司
DD 83 Lot 549, 553, 556 Sha Tau Kok Road, Fanling, New Territories, Hong Kong
香港新界粉嶺沙頭角公路 83 區 549, 553 及 556 地段

| Construction Materials 建築材料 | | |
|---|---|---|
| **ITEM TESTED OR MEASURED**<br>測試或量度項目 | **SPECIFIC TEST OR PROPERTY MEASURED**<br>特定測試或量度的特性 | **SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED**<br>規範、標準方法或應用技術 |
| Grout | Flow of grout for preplaced-aggregate concrete (flow cone method) | ASTM C939-02 |
| | Bleeding and free expansion | General Specification for Civil Engineering Works (2006) Vol. 2 Cl. 17.59-17.60<br>ASTM C940-98a |
| | Making and curing test cubes | General Specification for Civil Engineering Works (2006) Vol. 2 Cl. 17.63 (1) & (2)<br>CS1: 2010 Section 7 & 10 |
| | Compressive strength of grout cubes in the force range 20 kN - 3000 kN | General Specification for Civil Engineering Works (2006) Vol. 2 Cl. 17.63 (1) & (2)<br>CS1: 2010 Section 12 |

**Stanger Asia Limited**
史達嘉亞洲有限公司
DD 83 Lot 549, 553, 556 Sha Tau Kok Road, Fanling, New Territories, Hong Kong
香港新界粉嶺沙頭角公路 83 區 549, 553 及 556 地段

## Construction Materials 建築材料

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

**Stanger Asia Limited**
史達嘉亞洲有限公司
DD 83 Lot 549, 553, 556 Sha Tau Kok Road, Fanling, New Territories, Hong Kong
香港新界粉嶺沙頭角公路 83 區 549, 553 及 556 地段

## Construction Materials 建築材料

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

**Stanger Asia Limited**
史達嘉亞洲有限公司
DD 83 Lot 549, 553, 556 Sha Tau Kok Road, Fanling, New Territories, Hong Kong
香港新界粉嶺沙頭角公路 83 區 549, 553 及 556 地段

| Construction Materials 建築材料 | | |
|---|---|---|
| **ITEM TESTED OR MEASURED**<br>測試或量度項目 | **SPECIFIC TEST OR PROPERTY MEASURED**<br>特定測試或量度的特性 | **SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED**<br>規範、標準方法或應用技術 |
| Paint & varnish | Dry-film coating thickness by acoustic method | BS EN ISO 2808: 2019<br>(Method 10 – Ultrasonic reflection) |
| | Dry-film coating thickness by eddy current method | BS EN ISO 2808: 2007, BS 3900-C5: 2007 (Method 7D)<br>BS EN ISO 2808: 2019 (Method 7C) |
| | Dry-film coating thickness by magnetic method | BS EN ISO 2178: 2016<br>BS EN ISO 2808: 2007, BS 3900-C5: 2007 (Method 7C)<br>BS EN ISO 2808: 2019 (Method 7B.2) |
| Road surfaces | Skid resistance of road surfaces/markings using a portable pendulum tester | ASTM E303-93 (Reapproved 2018)<br>Highways Department (Research and Development Division) Guidance Notes on Road Testing - RD/GN/009 (Sep 1989) |
| Rock | Pull-out test of rock dowels | In-house method SPRD 01 |
| | Point load strength index of rock by diametral and axial tests | ASTM D5731-95<br>ASTM D5731-16<br>International Society for Rock Mechanics (1985) Suggested method for determining point load strength |

**Stanger Asia Limited**
史達嘉亞洲有限公司
DD 83 Lot 549, 553, 556 Sha Tau Kok Road, Fanling, New Territories, Hong Kong
香港新界粉嶺沙頭角公路 83 區 549, 553 及 556 地段

| Construction Materials 建築材料 | | |
|---|---|---|
| **ITEM TESTED OR MEASURED**<br>測試或量度項目 | **SPECIFIC TEST OR PROPERTY MEASURED**<br>特定測試或量度的特性 | **SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED**<br>規範、標準方法或應用技術 |
| Soil (Phase I) | Moisture content by oven-drying at 45°C ± 5°C | GEOSPEC 3: 2001 Test 5.1<br>GEOSPEC 3: 2017 Test 5.1 |
| | Moisture content by oven-drying at 105°C ± 5°C | GEOSPEC 3: 2001 Test 5.2<br>GEOSPEC 3: 2017 Test 5.2 |
| | Comparative test for the determination of moisture content by oven-drying | GEOSPEC 3: 2001 Test 5.3<br>GEOSPEC 3: 2017 Test 5.3 |
| | Liquid limit, plastic limit, and plasticity index | GEOSPEC 3: 2001 Test 6.1<br>GEOSPEC 3: 2017 Test 6.1 |
| | Liquidity index | GEOSPEC 3: 2001 Test 6.2<br>GEOSPEC 3: 2017 Test 6.2 |
| | Particle density by gas jar method | GEOSPEC 3: 2001 Test 7.1<br>GEOSPEC 3: 2017 Test 7.1 |
| | Particle density by small pyknometer method | GEOSPEC 3: 2001 Test 7.2<br>GEOSPEC 3: 2017 Test 7.2 |
| | Particle size distribution by wet sieving (with dispersant) | GEOSPEC 3: 2001 Test 8.1<br>GEOSPEC 3: 2017 Test 8.1 |
| | Particle size distribution by wet sieving (without dispersant) | GEOSPEC 3: 2001 Test 8.2<br>GEOSPEC 3: 2017 Test 8.2 |
| | Particle size distribution by hydrometer (with dispersant) | GEOSPEC 3: 2001 Test 8.5<br>GEOSPEC 3: 2017 Test 8.5 |
| | Particle size distribution by hydrometer (without dispersant) | GEOSPEC 3: 2001 Test 8.6<br>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<br>GEOSPEC 3: 2017 Test 8.7 |

**Stanger Asia Limited**
史達嘉亞洲有限公司
DD 83 Lot 549, 553, 556 Sha Tau Kok Road, Fanling, New Territories, Hong Kong
香港新界粉嶺沙頭角公路 83 區 549, 553 及 556 地段

| Construction Materials 建築材料 | | |
|---|---|---|
| **ITEM TESTED OR MEASURED**<br>測試或量度項目 | **SPECIFIC TEST OR PROPERTY MEASURED**<br>特定測試或量度的特性 | **SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED**<br>規範、標準方法或應用技術 |
| Soil (Phase I)<br>(cont'd) | Dry density/moisture content relationship of soils containing particles which are not susceptible to crushing (using a 1000cc mould and 2.5 kg rammer) | GEOSPEC 3: 2001 Test 10.1<br>GEOSPEC 3: 2017 Test 10.1 |
| | Dry density/moisture content relationship of soils containing particles which are susceptible to crushing (using a 1000cc mould and 2.5 kg rammer) | GEOSPEC 3: 2001 Test 10.2<br>GEOSPEC 3: 2017 Test 10.2 |
| | Dry density/moisture content relationship of soils containing particles which are not susceptible to crushing (using a CBR mould and 2.5 kg rammer) | GEOSPEC 3: 2001 Test 10.3<br>GEOSPEC 3: 2017 Test 10.3 |
| | Dry density/moisture content relationship of soils containing particles which are susceptible to crushing (using a CBR mould and 2.5 kg rammer) | GEOSPEC 3: 2001 Test 10.4<br>GEOSPEC 3: 2017 Test 10.4 |
| | Dry density/moisture content relationship of soils containing particles which are not susceptible to crushing (using a 1000cc mould and 4.5 kg rammer) | GEOSPEC 3: 2001 Test 10.5<br>GEOSPEC 3: 2017 Test 10.5 |
| | Dry density/moisture content relationship of soils containing particles which are susceptible to crushing (using a 1000cc mould and 4.5 kg rammer) | GEOSPEC 3: 2001 Test 10.6<br>GEOSPEC 3: 2017 Test 10.6 |
| | Dry density/moisture content relationship of soils containing particles which are not susceptible to crushing (using a CBR mould and 4.5 kg rammer) | GEOSPEC 3: 2001 Test 10.7<br>GEOSPEC 3: 2017 Test 10.7 |
| | Dry density/moisture content relationship of soils containing particles which are susceptible to crushing (using a CBR mould and 4.5 kg rammer) | GEOSPEC 3: 2001 Test 10.8<br>GEOSPEC 3: 2017 Test 10.8 |

**Stanger Asia Limited**
史達嘉亞洲有限公司
DD 83 Lot 549, 553, 556 Sha Tau Kok Road, Fanling, New Territories, Hong Kong
香港新界粉嶺沙頭角公路 83 區 549, 553 及 556 地段

| Construction Materials 建築材料 | | |
|---|---|---|
| **ITEM TESTED OR MEASURED**<br>測試或量度項目 | **SPECIFIC TEST OR PROPERTY MEASURED**<br>特定測試或量度的特性 | **SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED**<br>規範、標準方法或應用技術 |
| Soil (Phase I)<br>(cont'd) | 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<br>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<br>GEOSPEC 3: 2017 Test 11.2 |
| | Relative compaction of fill material | GEOSPEC 3: 2001 Test 11.4<br>GEOSPEC 3: 2017 Test 11.4<br>Buildings Department PNAP 55 (1994) Cl. 2 App. A |
| Soil (other) | Pull-out test of soil nails | Architectural Services Department General Specification for Building (2017) Section 26 Geotechnical Works on Soil and Rock Slopes Cl. 26.39<br>Architectural Services Department General Specification for Building (2022) Section 26 Geotechnical Works on Soil and Rock Slopes Cl. 26.44<br>Hong Kong Housing Authority Specification Library (2022) SLO.T310.9 to SLO.T320.9<br>General Specification for Civil Engineering Works (2020) Vol. 1 Cl. 7.144<br>GEOGUIDE 7 (2008) Cl. 6.3.2<br>GEOGUIDE 7 (2017) Cl. 6.3.2<br>GEOGUIDE 7 (2023) Cl. 6.3.2 |
| | Soil nail performance | Architectural Services Department General Specification for Building (2017) Section 26 Geotechnical Works on Soil and Rock Slopes Cl. 26.42<br>Architectural Services Department General Specification for Building (2022) Section 26 Geotechnical Works on Soil and Rock Slopes Cl. 26.47 |
| | Time domain reflectometry (TDR) test on soil nails | Geotechnical Engineering Office Guidelines on Test Procedure using Time Domain Reflectometry (TDR) to determine the length of installed soil nails (July 2007) |

**Stanger Asia Limited**
史達嘉亞洲有限公司
DD 83 Lot 549, 553, 556 Sha Tau Kok Road, Fanling, New Territories, Hong Kong
香港新界粉嶺沙頭角公路 83 區 549, 553 及 556 地段

| Construction Materials 建築材料 | | |
|---|---|---|
| **ITEM TESTED OR MEASURED**<br>測試或量度項目 | **SPECIFIC TEST OR PROPERTY MEASURED**<br>特定測試或量度的特性 | **SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED**<br>規範、標準方法或應用技術 |
| Structural fixings | Tensile test of anchors by incremental loading in the force range 1 kN – 1000 kN | BS 5080: Part 1: 1993 Cl. 6, 7.1.1 & 7.1.3 |
| | Tensile proof load test of anchors by incremental loading in the force range 1 kN – 1000 kN | BS 5080: Part 1: 1993 Cl. 6, 7.1.1 & 7.1.3 with modifications |
| | 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 – 640 kN | Buildings Department PNAP APP-169 (Oct 2023) App. A |
| | 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 – 640 kN | Buildings Department PNAP APP-169 (Oct 2023) App. B |
| | Tensile proof test of cementitious or polymer based grouted bolts or dowels or reinforcing bars works in the force range 2 kN – 640 kN | Buildings Department PNAP APP-169 (Oct 2023) App. C |
| | Shear test of anchors by incremental loading in the force range 1 kN –1000 kN | BS 5080: Part 2: 1986 + Amd. 7602 Cl. 4, 7.1, 7.2.1 & 7.2.3 |
| | Shear proof load test of anchors by incremental loading in the force range 1 kN – 1000 kN | BS 5080: Part 2: 1986 + Amd. 7602 Cl. 4, 7.1, 7.2.1 & 7.2.3 with modifications |
| | Shear proof load test of drilled-in anchors used for cantilevered structure/hanger/curtain wall remedial works by incremental or continuous loading in the force range 2 kN – 220 kN | Buildings Department PNAP APP-169 (Oct 2023) App. A |
| | 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 – 220 kN | Buildings Department PNAP APP-169 (Oct 2023) App. B |
| | Proof load test of spiders in the force range 1 kN – 100 kN | Buildings Department Code of Practice for the Structural Use of Steel (2011) Cl. 16.2.1<br>Buildings Department APP-37 (May 2012) App. C |

**Stanger Asia Limited**
史達嘉亞洲有限公司
DD 83 Lot 549, 553, 556 Sha Tau Kok Road, Fanling, New Territories, Hong Kong
香港新界粉嶺沙頭角公路 83 區 549, 553 及 556 地段

| Construction Materials 建築材料 | | |
|---|---|---|
| **ITEM TESTED OR MEASURED**<br>測試或量度項目 | **SPECIFIC TEST OR PROPERTY MEASURED**<br>特定測試或量度的特性 | **SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED**<br>規範、標準方法或應用技術 |
| Underground Utility Survey | Pipe cable locating / Electromagnetic locating | Specifications for Nondestructive Testing, Surveying, Imaging and Diagnosis for Underground Utilities – 1.1 Pipe Cable Locating / Electromagnetic Locating (2019) published by Department of Land Surveying and Geo-Informatics (LSGI) of The Hong Kong Polytechnic University |
| Welds (destructive) | Bend test on welds in metallic materials | BS EN 910: 1996<br>BS EN ISO 5173: 2023 |
| | Charpy V-notch impact test on welds in metallic materials | BS EN 875: 1995<br>BS EN ISO 9016: 2011 |
| | Fracture test on welds in metallic materials | BS EN 1320: 1997 |
| | Longitudinal tensile test on welds in metallic materials in the force range 20 kN – 1500 kN | BS EN 876: 1995<br>BS EN ISO 5178: 2011 |
| | Macroscopic examination on welds in metallic materials | BS EN 1321: 1997 + Amd. 14972<br>BS EN ISO 17639: 2022 |
| | Transverse tensile test on welds in metallic materials in the force range 15 kN – 1500 kN | BS EN 895: 1995<br>BS EN ISO 4136: 2011 |
| | Vickers hardness test across welded joints in the scale of HV 10 | BS EN 1043: Part 1: 1996<br>BS EN ISO 9015-1: 2011 |