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LABORATORY LOCATION:
(PERMANENT LABORATORY)
TESTECH SDN. BHD.
8, JLN. 30B / 146
DESA TASIK, SG. BESI
57000 KUALA LUMPUR
MALAYSIA

FIELD(S) OF TESTING:

MECHANICAL, NON-DESTRUCTIVE TEST

This laboratory has demonstrated its technical competence to operate in accordance with MS ISO/IEC 17025:2017 (ISO/IEC 17025:2017).

This laboratory's fulfillment of the requirements of ISO/IEC 17025 means the laboratory meets both the technical competence requirements and management system requirements that are necessary for it to consistently deliver technically valid test results and calibrations. The management system requirements in ISO/IEC 17025 are written in language relevant to laboratory operations and operate generally in accordance with the principles of ISO 9001 (see Joint ISO-ILAC-IAF Communiqué dated April 2017).

SCOPE OF TESTING: MECHANICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Hardened Concrete	1. Compressive Strength of Concrete Cube & Cylinder in the force range of 0kN to 5000kN *,**	BS EN 12390-3:2019 MS EN 12390-3:2012
	2. Compressive Strength of Concrete Core in the force range of 0kN to 3000kN *,**	BS EN 12504-1:2019 MS EN 12504-1:2013
	3. Determination of Density *,**	BS EN 12390-7:2019
	4. Determination of Density, Absorption and Voids *,**	ASTM C 642:21
	5. Initial Surface Absorption	BS 1881 Part 208: 1996
	6. Rapid Chloride Permeability	AASHTO Designation T277:07 ASTM C 1202-22e1

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SCOPE OF TESTING: MECHANICAL (Continue)

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Hardened Concrete	7. Water Permeability **	DIN 1048 Part 5: June 1991
	8. Static Modulus of Elasticity in Compression**	ISO 1920 Part 10: 2010 BS1881 Part 121: 1983
	9. Flexural Strength**	BS EN 12390-5: 2019
	10. Changes in Length on Drying and Wetting	MS EN 1367-4:2012 BS 1881 Part 5:1970- Amendment 1990 Clause 5 BS ISO 1920-8:2009
	11. Tensile Splitting Strength*	BS EN 12390-6: 2009
	12. Depth Penetration of Water Under Pressure**	BS EN 12390-8: 2019
	13. Water Absorption**	BS 1881 Part 122: 2011+ A1:2020
	14. Creep of Concrete in Compression ***	ASTM C512/C512M-15 ISO 1920-9: 2009 (E)
Fresh Concrete	1. Air Content (Pressure Method)	BS EN 12350-7: 2019
	2. Bleeding	ASTM C 232/C 232M 2021 Method A
	3. Setting Time (Penetration Resistance)	ASTM C 403/C 403M-23

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SCOPE OF TESTING: MECHANICAL (Continue)

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Metallic Fiber Concrete	1. Flexural Strength and Residual Strength for Fiber Concrete	ASTM C1609/C 16009M-19a BS EN 14488-3: 2006 BS EN 14651: 2005 (Amd. 2007) EFNARC: 1996 Clause 10.3 JSCE- SF4: 1984
	2. Energy Absorption Capacity & Toughness Test for Fiber Concrete	BS EN 14488-5: 2006 EFNARC: 1996 Clause 10.4
Resin Based Mortars	1. Compressive Strength of Resin Cube in the force range of 0kN to 2000kN ^{*,**}	ASTM C 109/C 109M 21 Clause 11 BS 6319: Part 2 1983 Excluding Clause 5.1 & 5.2
Portland Cement	1. Autoclave Expansion of Hydraulic Cement	ASTM C 151/C 151 M 18
Mortar	1. Compressive Strength of Mortar Cube in the force range of 0kN to 3000kN ^{*,**}	MS 522 Part 2: 2005 Clause 7.10 & Clause 7.11
Mortar for Brick Laying, Screeding, Plastering or Rendering	1. Compressive Strength Test ^{***}	BS 4551: 1980 Clause 15 BS EN 1015-11 : 2019, Clause 9
Grout for Prestressing Tendons	1. Compressive Strength Test ^{***}	BS EN 445-2007 Clause 4.6
Cement Mortar	1. Compressive Strength Test ^{***}	BS EN 196-1: 2016 Clause 9.2

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SCOPE OF TESTING: MECHANICAL (Continue)

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Repair Mortar	1. Compressive Strength Test ***	BS EN12190: 1999
Chemical-Resistant Mortars, Grout, Monolithic Surface, and Polymer Concretes	1. Compressive Strength Test ***	ASTM C579-23
Epoxy Bonding Agent	1. Compressive Strength Test ***	FIP/9/2: 1978 Clause 5.12 incorporated ASTM D695-15.
Bitumen	1. Bitumen content in Hot-mixed Paving Mixtures and Pavement Samples (Centrifuge Extraction Method)	ASTM D 2172/D 2172M-17e1 Clause 9
	2. Marshall Stability and Flow of Bituminous Mixtures	ASTM D 6927: 22
	3. Bulk Specific Gravity and Density of Compacted Bituminous Mixtures	ASTM D 2726/D 2726M 21

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SCOPE OF TESTING: MECHANICAL (Continue)

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Aggregates	1. pH value by the Electrometric Method	BS 1377:Part 3 2018 + A1 : 2021 Clause 12
	2. Particle Density and Water Absorption of Fine and Coarse Aggregates	BS 812:Part 2 1995 Clause 5 MS 30: 1971 Section 4 BS EN 1097- 6 : 2022
	3. Particle Size Distribution for Fine and Coarse Aggregates (Sieve Analysis)	BS EN 933-1: 2012 MS 30: Part 4 1995
	4. Clay, Silt and Dust in Fine or Coarse Aggregates (Decantation Method)	BS 812: Part 1 1975 Clause 7.2 MS 30: 1971 Section 3, Method B ASTM C 117-17
	5. Aggregate Crushing Value (ACV)	BS 812: Part 110 1990 MS 30: Part 8 1995
	6. Ten Percent Fines Value (TFV)	BS 812: Part 111 1990 MS 30: Part 9 1995
	7. Loss by Abrasion and Impact of Small – size Coarse Aggregates in The Los Angeles Machine	ASTM C 131/C 131M 20 MS 30: Part 11 1995 Section 1
	8. Flakiness Index of Coarse Aggregates	BS 812: Part 105-1 1989 MS 30: Part 5 1995 Section 1
	9. Particle Shape of Flakiness Index	BS EN 933-3: 2012

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SCOPE OF TESTING: MECHANICAL (Continue)

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Aggregates (continue)	10. Elongation Index of Coarse Aggregates	BS 812: Part 105-2 1990 MS 30: Part 5 1995 Section 2
	11. Particle Shape Index	BS EN 933-4:2008
	12. Acid Soluble Material in Fine Aggregates (Organic Impurities)	MS 30: Part 15 1995
	13. Organic Impurities in Fine Aggregate for Concrete	ASTM C40/C40M-20
	14. Soundness of Aggregates By Use of Sodium Sulfate or Magnesium Sulfate	ASTM C 88 /C88M - 18 AASHTO Designation: T104- 22
	15. Clay Lumps and Friable Particles in Aggregates	ASTM C142/C142M -17
	16. Impact Value Test	BS 812: Part 112 1990 MS 30: Part 10 1995
	17. Shell Content in Coarse Aggregate	BS 812: Part 106 1985 MS 30: Part 6 1995 BS EN 933-7: 1998
	18. Sand Equivalent Test	ASTM D 2419-22 BS EN 933-8: 2015

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Aggregates (continue)	19. Potential Alkali Reactivity (Mortar-Bar Method)	ASTM C 1260- 22
	20. Resistance to Degradation of Large Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine	ASTM C 535-16
	21. Resistance to Fragmentation by the Los Angeles Test Method	BS EN 1097-2: 2020 Clause 5.0
	22. Polished Stone Value	BS EN 1097-8:2020
	23. Lightweight Particle in Aggregate	ASTM C 123/C123M-14
	24. Loose Bulk Density and Void on Aggregate	BS EN 1097-3:1998
	25. Bulk Density, Voids and Bulking	BS 812: Part 2: 1995, Clause 6
	26. Methylene Blue Test	BS EN 933-9 : 2022

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SCOPE OF TESTING: MECHANICAL (Continue)

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Filling Materials (Soil)	1. Water Content	BS 1377-2:2022 Clause 4 BS EN ISO 17892-1:2014
	2. Liquid Limit (Fall Cone Method)	BS 1377-2: 2022 Clause 5.2 BS EN ISO 17892-12:2018, Clause 5.3
	3. Liquid Limit (Casagrande Apparatus Method)	BS 1377-2: 2022, Clause 5.4 BS EN ISO 17892-12:2018, Clause 5.4
	4. Plastic Limit and Plasticity Index	BS 1377-2: 2022, Clause 6.0 BS EN ISO 17892-12:2018, Clause 5.5
	5. Bulk Density	BS 1377-2: 2022 ,Clause 8 BS EN ISO 17892-2:2014
	6. Particle Size Distribution	BS 1377-2: 2022 ,Clause 10 BS EN ISO 17892-4:2016, Clause 5.2
	7. Dry Density /Moisture Content Relationship (Rammer Method – Proctor Test)	BS 1377-2: 2022, Clause 11.3 to 11.6
	8. Dry Density /Moisture Content Relationship (Vibrating Hammer Method - Proctor Test)	BS 1377-2: 2022: Clause 11.7
	9. California Bearing Ratio (CBR)	BS 1377-2: 2022: Clause 15

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SCOPE OF TESTING: MECHANICAL (Continue)

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Metallic Material	1. Bend Test	ISO 7438:2020 BS EN ISO 7438:2020
Steel Bar and Steel Plate	1.a) Tensile Strength b) Yield Stress Test c) Elongation	ISO 6892-1: 2019 Excluding site sampling
Cold Reduced Mild Steel Wire For The Reinforcement of Concrete	1.a) Tensile Test b) Rebend Test	MS 144: 2006 Annex B1.4 and B1.6 MS 144: 2014 Clauses 7.2.3 and 7.2.4
Welded Steel Fabric for the Reinforcement of Concrete	1. a) Tensile b) Rebend c) Weld	MS 145 : 2014 Clauses 7.2.3, 7.2.4 and 7.2.5 Excluding site sampling
	2. a) Tensile b) Bend c) Weld Shear Force	BS EN ISO 15630-2: 2019 ISO 15630-2: 2019 Clause 5, 6 and 7
Hot Rolled Steel Bars for the Reinforcement of Concrete	1. a) Tensile Strength b) Bend c) Rebend	MS 146: 2006 Clause 16.2, Annex B1.4 and B1.6 Excluding site sampling
Steel for Reinforcement Concrete - Weldable Reinforcing Bar	1. Tensile and Rebend Test	MS 146: 2014 Clauses 7.3.3, 7.3.5 and 9

SCOPE OF TESTING: MECHANICAL (Continue)

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Multi Wire Steel Strand	1. a) Tensile Test b) Elongation Test	ASTM A 370 -21 Annex A7 BS 5896: 2012 Clause 9 BS EN ISO 15630-3:2019
	2. a) Yield Strength b) Breaking Strength c) Elongation	ASTM A 1061/A 1061M- 20e1 Clause 9.1 to 9.3
High Tensile Wire and Strand	1. Stress Relaxation Test***	MS ISO 15630-3: 2009 Clause 8 ISO 15630-3: 2019 Clause 8 ASTM A1061/A1061M – 20ae1 Clause 9.4
Metallic Material (Reinforcing Bars, Wire Rods & Wire)	1. a) Tensile b) Bend c) Rebend	ASTM A 370 - 21 Appendix A9 BS EN ISO 15630-1: 2019 ISO 15630-1: 2019
Mechanical Coupler	1. Tensile Test	ISO 6892-1: 2019 Excluding Site Sampling Specification refer to BS 8110: Part 1 1997 (Amd. 1998) Clause 3.12.8.16.2 - Bar in Tension
Threaded Fastener	Internal Threaded (Nuts) 1. Cone Proof Load Test 2. Proof Load Test	ASTM F 606M-21 Clause 4.3 ISO 898-2: 2022/ BS EN ISO 898-2: 2022 Clause 9.1

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Threaded Fastener (Continue)	External Threaded (Bolts, Screws and Studs)	
	1. Tensile Test Under Wedge Loading	ISO 898-1: 2013 / BS EN ISO 898-1: 2013, Clause 9.1
	2. Tensile Test	ISO 898-1: 2013 / BS EN ISO 898-1:2013, Clause 9.2
	3. Tensile and Elongation	ISO 898-1: 2013 / BS EN ISO 898-1:2013, Clause 9.3
	4. Proof Load Test	ISO 898-1: 2013 / BS EN ISO 898-1: 2013 Clause 9.6
Ceramic Tiles	1. Water Absorption, Apparent Porosity, Apparent Relative Density and Bulk Density Test	MS ISO 10545-3: 2001 (Reapproved 2010)
	2. Modulus of Rupture and Breaking Strength Test	MS ISO 10545-4: 2003
	3. Chemical Resistance Test	MS ISO 10545-13: 2001
	4. Resistance to Stains Test	MS ISO 10545-14: 2001

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Bricks and Blocks	1. Compressive Strength *	BS EN 772-1:2011+ A:2015 MS 1933 -1:2017
	2. Water Absorption (Boiling Method) *	EN 772-7:1998 MS 1933-7:2017
Bricks	1. Determination of Compressive Strength of Masonry Units *	BS EN 772-1: 2015
Vitreous China Sanitary Appliances	1. Water Absorption	MS 147: 2021, Annex A
	2. Chemical Resistance	MS 147: 2021, Annex C
	3. Resistance to Staining	MS 147: 2021, Annex D
Security Seals	1. a) Tensile Test b) Shear Test c) Bend Test	ISO 17712: 2013(E) (Exclude Clause 6.5 - Impact Test)
Rock	1. Point Load Strength Index	ASTM D 5731-16

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Geotextile	1. Trapezoid Tearing Strength	ASTM D4533/D4533M-15 (Reapproved 2023)
	2. Tensile Properties by the Wide-Width Strip	ASTM D4595/ D4595M-23
	3. Grab Breaking Load and Elongation	ASTM D4632/D4632M – 15a (Reapproved 2023)
	4. Index Puncture Resistance	ASTM D 4833-2020
Rubber & Plastic	1. Tensile and Elongation Test	ASTM D 412-16 (2021), Method A
Plastic	1. Compressive Strength Test ***	ASTM D695-23
	2. Tensile and Elongation Test ***	ASTM D638-22
Thermal Insulating Product - Polystyrene Foam	1. Compressive Strength Test ***	BS EN 826: 2013
Rigid Cellular Materials	1. Compressive Strength Test ***	ASTM D1621-16(Reapproved 2023)

Signatories:

- | | |
|-------------------|-------------------------------------|
| 1. Yap Seow Keong | - All tests |
| 2. Tan Poh Kian | - All tests except tests marked *** |
| 3. Tan Poh Im | - Tests marked * only |

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SCOPE OF TESTING: MECHANICAL AND NON-DESTRUCTIVE TEST**SITE TESTING: CATEGORY 1**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Hardened Concrete	1. Penetration Resistance in the range of 0 inch to 2.500 inches (Windsor Probe Test) **	ASTM C 803/C 803M -18
	2. Surface Hardness Test by Rebound Hammer Method in the range of 20 to 55 rebound number, N *	BS EN 12504-2: 2021
Fresh Concrete	1. Air Content (Pressure Method)	BS EN 12350-7: 2019
	2. Bleeding	ASTM C 232/C 232M -2021 Method A
	3. Setting Time by Penetration Resistance	ASTM C 403/C 403M -16
Filling Material (Soil)	1. In-Situ CBR Test	BS 1377: Part 9 1990 Clause 4.3
	2. Determination of Penetration Resistance Using the JKR Probe (60° Cone) **	In house Method No. TP72 (JKR Specification)
	3. Field Density Test (Sand Replacement Method) *	BS 1377: Part 9:1990 Clause 2.1 & 2.2 ASTM D 1556-15e1

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SCOPE OF TESTING: MECHANICAL**SITE TESTING: CATEGORY 1 (Continue)**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Bitumen	1. Thickness or Height of Compacted Bituminous Paving Mixture Specimen	ASTM D3549/D3549M-2018 (Reapproved 2023)
Ground Anchorages	1. Pull Out Load & Displacement Measurement	BS 8081: 2015 Annex G2.7, G3.3 and G4.3
Structural Fixings	1. Tensile Load Test (Pull Out Test)	BS 5080-1: 1993 and BS 8539: 2012 Clause 9
Products and Systems for Protection and Repair Products for Concrete Structure	1. Bond Strength Test (Pull Off Test)	BS EN 1542: 1999
Coating Materials	1. Pull Off Strength Test Using Portable Adhesion Tester	ASTM D4541-22

Signatories:

- | | |
|-------------------|---|
| 1. Yap Seow Keong | - All tests |
| 2. Tan Poh Kian | - All tests except tests marked *** (Non- Resident) |
| 3. Tan Poh Im | - Tests marked * only |