

Schedule

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Certificate No. : LA-2008-0422-B
Issue No. : 16
Date : 26 February 2021
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FIELD OF TESTING : Civil Engineering Testing

MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT	SIGNATORY
A. AGGREGATE	1. Petrographic Examination of Aggregates for Concrete	BS EN 932-3: 1997 BS 7943:1999 BS 812 Part 104 - 1994 ASTM C295/C295M-19	) LJP, SW)))
	2. Potential Alkali Reactivity (Mortar Bar Method)	ASTM C1260: 2014	) LJP, SW, JUL
	3. Particle Size Distribution / Sieve Analysis	SS 73: 1974 ASTM C136 / C136M-19 BS 812 Part 103.1: 1985 BS EN 933-1: 2012 ASTM D546 - 17 (ASTM D242 / D242M -19)	) LJP, SW, JUL)))))
	4. Fineness Modulus	ASTM C136 / C136M-19)
	5. Clay, Silt and Dust (Decantation Method)	SS 73: 1974 (Except Method A) BS 812 Part 103.1: 1985 ASTM C117 - 17 BS EN 933-1: 2012))))
	6. Moisture Content (Oven Dried Method)	SS 73: 1974 BS 812 Part 109: 1990 BS EN 1097 -5: 2008)))
	7. Bulk Density	BS EN 1097- 3: 1998 BS 812 Part 2: 1995 SS 73: 1974)))

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A. AGGREGATE	8. Relative Density & Water Absorption	BS EN 1097-6: 2013 BS 812 Part 2: 1995 SS 73: 1974 ASTM C127: 2015 ASTM C128: 2015 (Gravimetric Method)) LJP, SW, JUL)))))
	9. Sampling	BS EN 932-1: 1997 BS 812 Part 102: 1989 SS 73: 1974)))
	10. Organic Impurities	ASTM C40 / C40M - 20 SS 73: 1974))
	11. Shell Content	SS 73 Part 6: 1992 BS 812 Part 106: 1985 BS EN 933-7: 1998)))
	12. Flakiness Index	SS 73 Part 5.1: 1992 BS EN 933-3: 2012 BS 812 Part 105.1: 1989)))
	13. Elongation Index	SS 73: 1974 BS 812 Part 105.2: 1990))
	14. Impact Value	SS 73: 1974 BS 812 Part 112: 1990))
	15. Crushing Value	SS 73: 1974 BS 812 Part 110: 1990))
	16. 10% Fines Value	SS 73: 1974 BS 812 Part 111: 1990))
	17. Los Angeles Abrasion	SS 73: 1974 ASTM C131 / C131M-20 BS EN 1097- 2: 2020 ASTM C535 - 16))))

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A. AGGREGATE	18. Soundness Test	ASTM C88/C88M-18 BS 812 Part 121: 1989 BS EN 1367- 2: 2009 SS 73 Part 21: 1992) LJP, SW, JUL)))
	19. Shape & Surface Texture	SS 73: 1974)
	20. Drying Shrinkage	SS 73 Part 20: 1992 BS EN 1367-4: 2008 BS 812 Part 120: 1995)))
	21. Assessment of Fines - Methylene Blue Test	BS EN 933-9:2009+A1:2013)
	22. Shape Index	BS EN 933-4: 2008)
	23. Angularity Number	SS 73: 1974)
	24. Assessment of Fines - Sand Equivalent Test	BS EN 933-8:2012+A1: 2015 ASTM D2419: 2014))
	25. Constituents of Coarse Recycled Aggregates	BS EN 933-11: 2009 SS 544: Part 2: 2019))
	26. Organic Contaminators by Mortar Method	BS EN 1744-1:2009+A1: 2012, Clause 15.3)
	27. Coral Content (Shell content in fine aggregate)	SANS 5840: 2008)
	28. Aggregate Abrasion Value	BS 812-113: 1990 BS EN 1097-8: 2020))
	29. Influence of Recycled Aggregate Extract on the Initial Setting Time of Cement	BS EN 1744-6: 2006)

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A. AGGREGATE	30. Percentage of Fractured Particles in Coarse Aggregate	ASTM D5821-13(2017)) LJP, SW, JUL
	31. Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate	ASTM D4791-19)
	32. Clay Lumps and Friable Particles in Aggregates	ASTM C142 / C142M: 17)
	33. Polished Stone Value	BS EN 1097-8: 2020 BS 812-114: 1989))
	34. Lightweight Particles in Aggregate	ASTM C123/C123M: 2014)
	35. Particle Density of Filler	BS EN 1097-7:2008)
B. SOIL	1. Direct Shear Box Test	BS 1377 Part 7: 1990 (Clause 4.5.4) BS EN ISO 17892-10:2018	) LJP, SW, JUL,) MAT
	2. Compaction Test (Maximum and Minimum Dry Density)	BS 1377 Part 4: 1990 (Clause 4))
	3. Compaction Test (Dry Density / Moisture Content)	BS 1377 Part 4: 1990 (Clause 3) ASTM D1557 - 12e1 ASTM D698 - 12e2)))
	4. Unconfined Compressive Strength	BS 1377 Part 7: 1990 (Section 7) ASTM D2166 / D2166M - 16 BS EN ISO 17892-7:2018)))
	5. Moisture Content	BS 1377-2: 1990 BS EN ISO 17892-1:2014 ASTM D2216 - 19 ASTM D4944 - 18 ASTM D4959 - 16 ASTM D4643 - 17))))))
	6. Liquid Limit	BS 1377-2: 1990, Method 4.3 ASTM D4318 - 17e1 ISO 17892-12:2018 BS EN ISO 17892-12:2018	) LJP, SW, JUL,) MAT))
	7. Plastic Limit & Plasticity Index	BS 1377-2: 1990, Section 5 ASTM D4318 - 17e1 ISO 17892-12:2018 BS EN ISO 17892-12:2018))))

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B. SOIL	8. Linear Shrinkage	BS 1377-2: 1990, Section 6.5) LJP, SW, JUL,) MAT
	9. Particle Size Distribution	BS 1377-2: 1990, Method 9.2, 9.3 & 9.5 BS EN ISO 17892-4:2016)))
	10. California Bearing Ratio	BS 1377-4: 1990, Method 7 ASTM D1883 - 16))
	11. Particle Density	BS 1377-2:1990, Section 8 BS EN ISO 17892-3:2015))
	12. Percentage of Fines (Finer than 75micron)	ASTM D1140 - 17	) LJP, SW, JUL
	13. Sand Replacement	BS 1377-9: 1990, Method 2.1 & 2.2 ASTM D1556/D1556M-15ε1 & ASTM D4944-18	) LJP, SW, AC, MAT))
	14. In-place Density & Water Content (NDG)	ASTM D6938 - 17 ASTM D2922: 2005 ASTM D3017: 2005 BS 1377-9: 1990 Clause 2.5))))
	15. Plate Loading Test	BS 1377-9: 1990 Method 4.1	) LJP, AC
	16. Density	BS 1377-2: 1990, Section 7 BS EN ISO 17892-2:2014	) LJP, SW, JUL,) MAT
	17. Permeability in Triaxial Cell	BS 1377-6:1990 (Section 6) BS EN ISO 17892-11:2019	) LJP, SW, JUL)
	18. Unconsolidated Undrained Triaxial (UU)	BS 1377-7:1990 (Section 8) BS EN ISO 17892-8:2018 ASTM D2850 - 15)))
	19. Consolidated Undrained Triaxial (CU)	BS 1377-8:1990 (Section 7) BS EN ISO 17892-9:2018 ASTM D4767 – 11 (2020))))
	20. Consolidated Drained Triaxial (CD)	BS 1377-8:1990 (Section 8) BS EN ISO 17892-9:2018 ASTM D7181 – 20)))

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B. SOIL	21. Oedometer (One-Dimensional Consolidation)	BS 1377-5:1990 (Section 3) BS EN ISO 17892-5:2017 ASTM D2435 / D2435M – 11 (2020)) LJP, SW, JUL))
	22. Falling Head Permeability	KH. Head Vol. 2 BS EN ISO 17892-11:2019))
	23. Bentonite content in soil	ADM/CE/024: 2019	) LJP, SW, JUL, MAT
	24. Soil Resistivity Using the Wenner Four-Electrode Method	ASTM G57 - 06(2012) (BS EN IEC 62561-7:2018)	) LJP, SW, JUL)
	25. Corrosion Rates by Potentiodynamic Polarization Resistance Measurements	ASTM G59 - 97(2014) & ASTM G102 - 89(2015)e1 (BS EN IEC 62561-7:2018))))
C. CONCRETE 1. Fresh Concrete	1. Slump Test	SS 78: Pt A2: 1987 BS 1881: Pt 102: 1983 BS EN 12350-2: 2019	) LJP, SW, JUL)
	2. Density (Fresh Concrete)	SS 78: Pt A7: 1987 BS 1881: Pt 107: 1983 BS EN 12350-6: 2019)))
	3. Sampling	BS EN 12350-1: 2019 SS 78 Part A1:1987 BS 1881 Part 101: 1983)))
	4. Air Content-Pressure Methods	BS EN 12350-7: 2019 SS 78 Part A6: 1987 BS 1881 Part 106: 1983)))
	5. Flow Table Test	SS 78: Pt A5: 1987 BS 1881: Pt 105: 1984 BS EN 12350-5: 2019	) LJP, SW, JUL))
	6. Degree of Compactibility	BS EN 12350-4: 2019)
	7. Laboratory Mixing and Sampling	SS 78: Pt 25: 1987 BS 1881-125: 2013 BS EN 480-1: 2014)))
	8. Time of Setting of Concrete Mixtures by Penetration Resistance	ASTM C403 / C403M - 16))

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C. CONCRETE 1. Fresh Concrete	9. Slump-flow test	BS EN 12350-8: 2019) LJP, SW, JUL	
	10. V-funnel test	BS EN 12350-9: 2010)	
	11. L box test	BS EN 12350-10: 2010)	
	12. Sieve segregation test	BS EN 12350-11: 2010)	
	13. J-ring test	BS EN 12350-12: 2010)	
	14. Adiabatic Temperature Rise of Fresh Concrete	ADM/CE/023: 2017)	
	2. Hardened Concrete (Physical Tests)	1. Petrographic Examination of Hardened Concrete	ASTM C856 - 20	) LJP, SW
		2. Density (Hardened Concrete)	SS 78: Pt A14: 1987 BS 1881: Pt 114: 1983 BS EN 12390-7: 2019	) LJP, SW, JUL,) WCK)
		3. Compressive Strength of Cubes	SS 78: Pt A16: 1987 BS 1881: Pt 116: 1983 BS EN 12390-3: 2019 AS 1012.9: 2014))))
		4. Water Absorption	SS 78: Pt A22: 1987 BS 1881-122: 2011 ASTM C642: 2013)))
		5. Water Permeability	DIN 1048: Pt 5 - 1991)
		6. Depth of penetration of water under Pressure	BS EN 12390-8: 2019)
		7. Making Test Beams	SS 78 Part A9: 1987 BS 1881 Part 109: 1983 BS EN 12390-1: 2012 BS EN 12390-2: 2019	) LJP, SW, JUL)))
		8. Making Test Cylinders	SS 78 Part A10: 1987 BS 1881 Part 110: 1983 BS EN 12390-1: 2012 BS EN 12390-2: 2019))))
9. Tensile Splitting Strength of Test Specimens		SS 78 Part A17: 1987 BS 1881 Part 117: 1983 BS EN 12390-6: 2009) LJP, SW, JUL,) WCK)	

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2. Hardened Concrete (Physical Tests)	10. Making of Test Cubes	SS 78: Pt A8: 1987 BS 1881: Pt 108: 1983 BS EN 12390-1: 2012 BS EN 12390-2: 2019) LJP, SW, JUL)))
	11. Flexural Strength	SS 78: Pt A18: 1987 BS 1881: Pt 118: 1983 BS EN 12390-5: 2019	) LJP, SW, JUL,) WCK)
	12. Compressive Strength of Cores	SS 78: Pt A20: 1987 BS 1881: Pt 120: 1983 BS EN 12504-1: 2019 AS 1012.9: 2014))))
	13. Static Modulus of Elasticity in Compression	BS 1881: Pt 121: 1983 ASTM C469 / C469M - 14 BS EN 12390-13:2013)))
	14. Initial Surface Water Absorption	BS 1881: Pt 208: 1996	) LJP, SW, JUL
	15. Length Change (Drying Shrinkage & Wetting Expansion)	ASTM C157/C157M-17)
	16. Concrete's Ability to Resist Chloride Ion Penetration (Rapid Chloride Permeability Test)	ASTM C1202 - 19	) LJP, SW, JUL, WCK
	17. Coefficient of Permeability	Darcy's Theory - HDB Test Method ADM/CE/017: 2013))
	18. Water Penetration & Water Gain	HDB Test Method (1 April 1992) ADM/CE/018: 2014	) LJP, SW, JUL)
19. Compressive Strength of Moulded Cylinder Specimens	BS EN 12390-3: 2019 AS 1012.9: 2014) LJP, SW, JUL)	

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2. Hardened Concrete (Physical Tests)	20. Microscopical Determination of Parameters of the Air-Void System in Hardened Concrete	ASTM C457 / C457M – 16 (Procedure B)) LJP, SW, JUL
	21. Water Sorptivity	ASTM C1585 - 20 ADM/CE/020: 2016	) LJP, SW, JUL)
	22. Density, Absorption, and Voids	ASTM C642 - 13	) LJP, SW, JUL,)
	23. Calibration of Cube Mould	BS EN 12390-1: 2012))
	24. Autogenous Strain of Cement Paste and Mortar	ASTM C1698-19)))
	25. Flexural tensile strength (limit of proportionality (LOP), residual)	BS EN 14651:2005+A1:2007)))
	26. Fibre content in fresh and hardened concrete	BS EN 14721:2005+A1:2007))
	27. Chloride Migration Coefficient	NT BUILD 492: 1999)
	28. Drying Shrinkage	BS ISO 1920-8:2009 BS EN 12390-16:2019 BS 8443: 2005 (Annex B)	) LJP, SW, JUL,) WCK))
29. Creep in Compression	BS ISO 1920-9:2009 BS EN 12390-17:2019 ASTM C512 / C512M - 15))))	
3. Hardened Concrete (Non-Destructive Tests)	1. Determination of Rebound Number of Hardened Concrete	ASTM C805 / C805M - 18 BS EN 12504-2: 2012	) LJP, SW, AC)
	2. Ultrasonic Pulse Velocity Measurement	ASTM C597 - 16 BS EN 12504-4: 2004)))
	3. Covermeter Test	BS 1881: Pt 204: 1988))
	4. Strain Measurement (Electrical Displacement)	BS 1881: Pt 206: 1986	) LJP, SW))
	5. Initial Surface Absorption	BS 1881: Pt 208: 1996))
	6. Half-Cell Potential Measurement	ASTM C876 - 15	) LJP, SW, AC))
	7. Depth of Carbonation, cores or broken (on concrete)	BS EN 14630: 2006 BRE Publication (IP6/81) RILEM TC14-CPC 1988))))
	8. Penetration Resistance	ASTM C803 / C803M - 18)

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D. REPAIR MATERIAL	1. Non-Shrink Grout (For Pressure Grouting)	1. Flow Consistency	ASTM C939 / C939M - 16a)	
		2. Compressive Strength	ASTM C942 - 15)	
		3. Expansion/Shrinkage	ASTM C940 - 16)	
		4. Bleeding	ASTM C940 - 16)	
		5. Setting Time (Initial & Final Set)	ASTM C953 - 17)	
	2. Non-Shrink Grout (For Semi-Precast Construction)	1. Flow Consistency	BS 4551-1: 1998) ASTM C1437 - 20)	LJP, SW, JUL
		2. Compressive Strength	BS EN 196-1:2016) ASTM C109 / C109M - 20b)	LJP, SW, JUL, WCK
		3. Change in Height	ASTM C827 / C827M - 16)	LJP, SW, JUL
		4. Setting Time	BS EN 196-3: 2016)	
		5. Bond Strength at 28 days	BS 6319: Part 4: 1984) BS EN 12615: 1999)	
	3. Polymer Modified Cement Mortar	1. Compressive Strength	ASTM C109 / C109M - 20b) BS EN 12190: 1999) ASTM C349 - 18)	LJP, SW, JUL, WCK LJP, SW, JUL
		2. Stiffening time	BS EN 1015-9: 1999)	
		3. Shrinkage at 28 days	ASTM C531 - 18)	
		4. Tensile pull off strength (before and after weathering)	BS EN 1015-12: 2016) ADM/CE/010: 2017) ADM/CE/011: 2017)	
	4. Bonding Agent	1. Slant Shear Bond Strength (Type I)	ASTM C1042: 1999)	LJP, SW, JUL
		2. Slant Shear Bond Strength (Type II)	ASTM C1042: 1999)	
		3. Total Solids Content	ISO 124: 2014)	
	5. Waterproofing Material for External Wall Seepage Repair	1. Tensile pull off strength	ASTM D4541: 2002 (Method A, Type I Tester)) ASTM D7234 -19)	LJP, SW, JUL
		2. Water Vapour Transmission (Water Method only)	ASTM E96 / E96M - 16) ASTM D1653: 2013)	
		3. Tensile Strength & Elongation at Break	ASTM D412 - 16 Method A only)	
4. Crack Bridging		ASTM C836 / C836M - 18) ADM/CE/001: 2017) AS/NZS 4548.5: 1999)		

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6. Flexible Cementitious Waterproof Membrane (Water-Based)	1. Tensile pull off strength	ASTM D4541: 2002 (Method A, Type I Tester) ASTM D7234 -19) LJP, SW, JUL)
	2. Tensile Strength & Elongation at Break	ASTM D412 - 16 Method A)
	3. Crack Bridging	ASTM C836 / C836M - 18 ADM/CE/002: 2017))
	4. Water Penetration Test	DIN 1048: Pt 5 - 1991 ADM/CE/003: 2010))
	5. Initial Hardness (Shore A)	ASTM D2240 – 15e1)
	6. Set to touch	ASTM D1640/D1640M-14(2018))
7. Flexible Non-Cementitious Waterproof Membrane (Water-Based)	1. Tensile pull off strength	ASTM D4541: 2002 (Method A, Type I Tester) ASTM D7234 - 19	) LJP, SW, JUL)
	2. Tensile Strength & Elongation at Break	ASTM D412 - 16 Method A)
	3. Crack Bridging	ASTM C836 / C836M - 18 ADM/CE/002: 2017))
	4. Water Penetration Test	DIN 1048: Pt 5 - 1991 ADM/CE/004: 2010))
	5. Initial Hardness (Shore A)	ASTM D2240 – 15e1)
	6. Set to touch	ASTM D1640/D1640M-14(2018))

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8. Waterproofing Membrane for RC Roof - Bituminous Type	1. Tensile pull off strength	ASTM D4541: 2002 (Method A, Type I Tester) ASTM D7234 - 19) LJP, SW, JUL)
	2. Tensile Strength & Elongation at Break	ASTM D412 - 16 Method A)
	3. Crack Bridging	ASTM C836 / C836M - 18 ADM/CE/002: 2017))
	4. Water Vapour Transmission	ASTM E96 / E96M - 16)
	5. Water Penetration Test	DIN 1048: Pt 5 - 1991 ADM/CE/005: 2010))
	6. Initial Hardness (Shore A)	ASTM D2240 – 15e1)
	7. Accelerated Weathering	ASTM G154 - 16 ADM/CE/007: 2012))
	8. Set to touch	ASTM D1640/D1640M-14(2018))
	9. Solid Content	SS 133: 2017 Annex D (<u>Method A</u>))
	10. Heat Test	SS 133: 2017 Annex H)
	11. Water Resistance Test	SS 133: 2017 Annex J)
	12. Direct Flame Test	SS 133: 2017 Annex K)
9. Repair Material - Reinforcement Primer / Reinforcement Bar	1. Half-Cell Potential	ASTM C876 - 15	) LJP, SW, JUL
	2. Bond Performance	SS 2 Part 3: 1987 Appendix A)
10. Epoxy Mortar	1. Working Time, Initial Setting Time and Service Strength Setting Time	ASTM C308-18	) LJP, SW, JUL
	2. Compressive Strength	ASTM C579 - 18)
	3. Coefficient of Linear Thermal Expansion	ASTM C531 - 18)
	4. Water Absorption	ASTM C413 - 18)
	5. Tensile Strength	ASTM C307 - 18)
	6. Flexural Strength	ASTM C580 - 18)

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11. Epoxy Resin for Injection	1. Determination of Bond Strength	ASTM C882 / C882M: 2020) LJP, SW, JUL
	2. Density	SS 5: Pt B7: 2013 (2018) ASTM D1475: 2013))
12. Bituminous and Non-Bituminous Pre-formed Waterproofing Membrane for Concealed Roof	1. Dimensional Stability	SS 374: 1994 (2017)	) LJP, SW, JUL
	2. Tensile Strength and Elongation at Break)
	3. Tensile Shear at Joints)
	4. Pliability)
	5. Water Absorption and Soluble Matter)
	6. Water Vapour Transmission)
	7. Hydrostatic Test)
	8. Resistance to Leakage at Joint)
13. Waterproofing Membrane	1. Thickness and Mass Per Unit Area	DIN 53353: 1979-12 &	) LJP, SW, JUL
		DIN 16726: 2011-01)
		BS EN 1849-1: 2000)
		BS EN 1849-2: 2019)
		BS EN 22286: 1994 (BS 3424-1: 1994))
		(ISO 2286: 1986))
		DIN EN ISO 2286-3:2016)
		ASTM D3767 - 03(2020))
		2. Tensile Strength & Elongation at Break	SS 374: 1994 (2017)
	ASTM D412 - 16 Method A)	
	BS EN 12311-1: 2000)	
	BS EN 12311-2: 2013)	
	BS EN ISO 527-1: 2019)	
	BS EN ISO 527-3: 2018)	
3. Dimensional Stability	SS 374: 1994 (2017)) LJP, SW, JUL	
	BS EN 1107-1: 2000)	
	BS EN 1107-2: 2001)	
	DIN 53377: 2015-04 &)	
	DIN 16726: 2011-01)	

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13. Waterproofing Membrane	4. Watertightness/Behaviour under Hydrostatic Pressure / Water impermeability	SS 374: 1994 (2017) BS EN 1928: 2000 DIN 16726: 2011-01 BS EN 12390-8: 2019, based on BS EN 14891: 2017, Part A7 for concrete mix design) LJP, SW, JUL))))
	5. Peel or Stripping Strength to Concrete	ASTM D903 - 98(2017))
	6. Puncture Resistance	ASTM E154 / E154M - 08a (2019)e1, Section 10))
	7. Impact Resistance	ADM/CE/021: 2016 & ASTM G14 – 04 (2018))
	8. Static Crack Bridging	ASTM C836 / C836M - 18 & ASTM C1305 - 16 BS EN 1062-7: 2004, Method A)))
	9. Pull-Off Adhesion Strength	ASTM D4541: 2002 (Method A, Type I Tester) ASTM D7234 - 19 BS EN 1542: 1999))))
	10. Artificial ageing by long term exposure to elevated temperature	BS EN 1296: 2001 SS 374: 1994 (2017) DIN 16726: 2011-01	) LJP, SW, JUL))
	11. Behaviour after Storage in Aqueous Solutions	DIN 16726: 2011-01)
	12. Chemical Resistance	BS EN 14414: 2004 (METHOD A & B) ASTM D543 - 20)))
	13. Resistance to Leaching	BS EN 14415: 2004 (METHOD A & B))
	14. Hydrostatic Pressure Resistance	ASTM D5385 / D5385M - 20)
	15. Lateral Water Migration	ADM/CE/022: 2016 & ASTM D5385 / D5385M - 20)
	16. Tear Strength	ASTM D624 - 00 (2020) (Type C & T))
	17. Resistance to static loading	BS EN 12730:2015 Method B)
	18. Resistance Tearing	BS EN 12310-2:2018)
	19. Peel resistance of joints	BS EN 12316-2:2013)

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14. Rubber Waterstop	1. Change in Mass (after immersion) Change in Volume (after immersion)	ASTM D471 - 16a) LJP, SW, JUL
E. BUILDING MATERIAL	1. Tensile Adhesion Bond Strength	BS EN 1348: 2007 BS EN 12004-2:2017	) LJP, SW, JUL
1. Tile Adhesive (Fast and Normal Set)	2. Tensile Adhesion Bond Strength (After Water immersion)	BS EN 1348: 2007 BS EN 12004-2:2017))
	3. Tensile Adhesion Bond Strength (After Heat Aging)	BS EN 1348: 2007 BS EN 12004-2:2017))
	4. Open Time	BS EN 1346: 2007 BS EN 12004-2:2017))
	5. Deformity	BS EN 12002: 2008 BS EN 12004-2:2017))
	6. Slip	BS EN 1308: 2007 BS EN 12004-2:2017))
	7. Pull Out Test (Site Test)	ADM/CE/015: 2011	) LJP, AC
2. Tile Grout	1. Shrinkage	BS EN 12808-4: 2009	) LJP, SW, JUL
	2. Water Absorption	BS EN 12808-5: 2008)
	3. Compressive Strength	BS EN 12808-3: 2008)
	4. Flexural Strength	BS EN 12808-3: 2008)
	5. Abrasion Resistance	BS EN 12808-2: 2008)
3. Prepacked Floor Screed/ Prepacked Waterproof Screed	1. Average compressive strength	ASTM C109 / C109M – 20b	) LJP, SW, JUL, WCK
	2. Flow	ASTM C1437 - 15	) LJP, SW, JUL
	3. Water Absorption	ASTM C413 - 18)
	4. Water Penetration Test	DIN 1048: Pt 5 - 1991 ADM/CE/003: 2010)
	5. Flexural Strength	ASTM C348 - 20)
	6. Water Retentivity	BS 4551: 2005+A2: 2013)
	7. Stiffening time	BS EN 1015-9: 1999 (Method A))
	8. Volume change	ASTM C827 / C827M - 16)

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4. Prepacked Plaster/ Prepacked Mortar	1. Tensile pull off strength	BS EN 1015-12: 2016) LJP, SW, JUL
	2. Compressive Strength	BS EN 1015-11: 2019 BS 4551-1: 1998))
	3. Consistence Retentivity	BS 4551: 2005 + A2: 2013)
	4. Water Retentivity	BS 4551: 2005 + A2: 2013)
	5. Stiffening time	BS EN 1015-9:1999 (Method A))
	6. Linear Shrinkage	ASTM C531 - 18)
	7. Pull Out Test (Site Test)	ADM/CE/016: 2011	) LJP, AC
	8. Determination of modulus of elasticity in compression	BS EN 13412:2006 (Method 2)	) LJP, SW, WCK
5. Prepacked Skim Coat	1. Tensile pull off strength	BS EN 1015-12: 2016	) LJP, SW, JUL
	2. Tensile pull off strength (after weathering)	BS EN 1015-12: 2016 ADM/CE/008: 2017))
	3. Compressive Strength	BS EN 1015-11: 2019)
	4. Water Retentivity	BS 4551: 2005+A2: 2013)
	5. Setting Time	BS EN 196-3: 2016)
	6. Linear Shrinkage	ASTM C531 - 18)
	7. Pull Out Test (Site Test)	ADM/CE/016: 2011	) LJP, AC
6. Acrylic Polymer Cementitious Coating	1. Compressive Strength	ASTM C109 / C109M – 20b	) LJP, SW, JUL, WCK
	2. Flexural Strength	ASTM C348 - 20	) LJP, SW, JUL
	3. Tensile Strength	ASTM C307: 2003 (2012))
	4. UV Accelerated Weathering	ASTM G154 - 16 ADM/CE/009: 2012))
	5. Skid Resistance	ASTM E303 - 93 (2018))
	6. Taber Abrasion	ASTM D4060: 2019 ADM/CE/012: 2015))
	7. Shear Bond Adhesive	ASTM C482: 2020 ADM/CE/013: 2010))

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6. Acrylic Polymer Cementitious Coating	8. Water Penetration Test	DIN 1048: Pt 5 - 1991 ADM/CE/006: 2010) LJP, SW, JUL
7. Self-Leveling Screed	1. Compressive Strength	ASTM C109 / C109M – 20b	) LJP, SW, JUL, WCK
	2. Linear Shrinkage/Length Change	ASTM C157/C157M-17 ASTM C531 - 18	) LJP, SW, JUL)
	3. Slip Resistance (before & after accelerated weathering)	BS 7976-2: 2002+A1: 2013)
	4. Tensile Adhesion Bond Strength	ASTM D4541: 2002 (Method A, Type I Tester) BS EN 13892-8: 2002))
	5. Shear Adhesion Bond Strength	ASTM C482: 20)
	6. Accelerated Weathering (UV Exposure)	ASTM G154 - 16)
	7. Flowability	ASTM C939 / C939M - 16a)
	8. Water Absorption	ASTM C413 - 18 (Method A))
8. Sealant	1. Staining and Color Change	ASTM C510 - 16	) LJP, SW, JUL
	2. Extrusion Rate	ASTM C1183 / C1183M-13 (2018))
	3. Rheological (Flow) Properties	ASTM C639 – 15 (2020))
	4. Indentation Hardness	ASTM C661 - 15)
	5. Tack-Free Time	ASTM C679 - 15)
	6. Adhesion and Cohesion Under Cyclic Movement (Hockman Cycle)	ASTM C719 – 14 (2019))
	7. Effects of Heat Aging	ASTM C1246 - 17)
	8. Effects of Laboratory Accelerated Weathering	ASTM C793 - 05 (2017))
	9. Adhesion-in-Peel	ASTM C794 - 18)
	10. Durability of Sealants Exposed to Continuous Immersion in Liquids	ASTM C1247 - 20)

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F. PAINT / COATING	1. Adhesion (Pull Off) Strength	ASTM D4541 – 17(Method B) ASTM D7234: 2019 BS EN ISO 4624:2016 (Method B) BS EN 1542:1999) LJP, SW, JUL)))
	2. Non-Destructive Measurement of Dry Film Thickness of Non-Magnetic Coatings Applied to a Ferrous Base	ASTM D7091: 2013 BS EN ISO 2178:2016	) LJP)
	3. Dry Film Thickness	ISO 2808: 2019 (Method 7B2 and 7c) ASTM D7091: 2013 ASTM D6132 - 13(2017))))
	4. Alkali resistance (spotting method)	SS 5 - G2 : 2003 (2013)	) LJP, SW, JUL
	5. Compatibility on wet concrete	BS EN 13578:2003)
	6. Methods of conditioning before testing - UV accelerated weathering	BS EN 1062-11:2007 ISO 11507:2007)
	7. Static Crack Bridging	BS EN 1062-7: 2004, Method A)
	8. Tensile & Elongation at Break	BS ISO 37:2017)
	9. Water-Vapour Transmission	BS EN ISO 7783: 2018)
	10. Luminance Factor	SS 589 : 2013 (BS EN 1871:2000 Annex E)	) LJP, SW, JUL)
	11. Skid Resistance	SS 589 : 2013 Annex C)
	12. Flow Resistance	SS 589 : 2013 Annex B)
	13. Softening Point	SS 589: 2013 (BS EN 1871:2000 Annex F))
	14. Heat stability	SS 589 : 2013 (BS EN 1871:2000 Annex G))
	15. Rating Adhesion by Tape Test	ASTM D3359 - 17)
	16. Carbon Dioxide Permeability	BS EN 1062-6:2002 (Method A))

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G. ADMIXTURES	1 Water Reduction	BS EN 12350-2: 2019 BS EN 480-1: 2014 SS EN 934-2: 2015) LJP, SW, JUL))
	2 Compressive Strength	BS EN 12390-3: 2019 BS EN 480-1: 2014 SS EN 934-2: 2015)))
	3 Air Content-Pressure Methods	BS EN 12350-7: 2019 BS EN 480-1: 2014 SS EN 934-2: 2015)))
	4 Increase in Consistence	BS EN 12350-2: 2019 BS EN 480-1: 2014 SS EN 934-2: 2015)))
	5 Retention of Consistence	BS EN 12350-2: 2019 BS EN 480-1: 2014 SS EN 934-2: 2015)))
	6 Bleeding	BS EN 480-4: 2005 BS EN 480-1: 2014 SS EN 934-2: 2015)))
	7 Setting Time	BS EN 480-2: 2006 BS EN 480-1: 2014 SS EN 934-2: 2015)))
	8 Capillary Absorption	BS EN 480-5: 2005 BS EN 480-1: 2014 SS EN 934-2: 2015)))
	9 Sampling	BS EN 934-6: 2019 SS EN 934-6: 2008 (2015)))

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H. CEMENT 1. Ordinary Portland Cement/Sulphate-resisting and Portland Blast Furnace Slag Cement. Ground Granulated Blast Furnace Slag, Silica Fume & Fly Ash	1. Determination of Strength	BS EN 196-1: 2016) ASTM C109 / C109M – 20b) SS 397 Part 1: 1997)	LJP, SW, JUL) LJP, SW, JUL, WCK) LJP, SW, JUL)
	2. Determination of Setting Times	BS EN 196-3: 2016) SS 397 Part 3: 1997) ASTM C191 – 19))))
	3. Determination of Soundness	BS EN 196-3: 2016) SS 397 Part 3: 1997)))
	4. Determination of Fineness	BS EN 196-6: 2018) SS 397 Part 6: 1997) ASTM C204 – 18e1))))
	5. Moisture Content	BS EN 15167: Pt 1: 2006 Annex A) SS EN 15167: Pt 1: 2008 Annex A)))
	6. Activity Index	BS EN 196-1: 2016) BS EN 15167-1: 2006, 5.3.2.3) BS EN 13263-1: 2005+A1: 2009, 5.3.3) BS EN 450-1: 2012, 5.3.2)))))
	7. Air Content	ASTM C185 - 20))
	8. Amount of Water Required for Normal Consistency	ASTM C187 - 16))
	9. Fineness by Wet Sieving	BS EN 451-2:2017))
	10. Water Requirement for Category S Fly Ash	BS EN 450-1:2012, Annex B))
	11. Potential Expansion of Portland-Cement Mortars Exposed to Sulfate	ASTM C452 – 19e1))

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2. Masonry Cement	1. Setting Time	BS EN 413-2: 2016 BS EN 196-3: 2016) LJP, SW, JUL))
	2. Soundness	BS EN 196-3: 2016))
	3. Compressive Strength	BS EN 196-1: 2016))
	4. Consistence of Fresh Mortar	BS EN 413-2:2016))
	5. Air Content	BS EN 413-2:2016))
	6. Water Retentivity	BS EN 413-2:2016))
	7. Sieve Residue	BS EN 196-6: 2018)
I. CURING COMPOUND	1. Water Retention	ASTM C156-20	) LJP, SW, JUL)
	2. Bond Strength Test	ASTM C882/C882M: 2020, Clause 11.3 only ADM/CE/019: 2014)))
	3. Density Test	ASTM D1475: 2013))
	4. Non Volatile Matter Test	ASTM D1644 - 01(2017) (Method A & B)))
	5. Volatile Content	ASTM D2369 - 20)
J. MASONRY UNITS 1. Ferrocement Roof Slabs / Sunbreaker Slabs	1. Dimension and Density	BS EN 12390-7: 2019	) LJP, SW, JUL)
	2. Cover Measurement	BS 1881: Pt 204: 1988))
	3. Initial Surface Absorption	BS 1881: Pt 208: 1996))
	4. Carbonation Depth	BRE Publication (IP6/81) BS EN 14630: 2006))
2. Burnt Clay and Shale Bricks	1. Determination of Dimensions	} SS 103: 1974	) LJP, SW, JUL))))
	2. Determination of Compressive Strength))
	3. Water Absorption Test))
	4. Soluble Salt Content))
	5. Efflorescence Test))

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3. Masonry Units / Autoclaved Aerated Concrete	1. Compressive Strength	BS EN 772-1: 2011+A1:2015 ASTM C1693-11(2017), Section 6) LJP, SW, JUL))
	2. Density	BS EN 772-13: 2000 BS EN 678: 1994 ASTM C1693-11(2017), Section 7))))
	3. Drying Shrinkage	BS EN 680: 2005 ASTM C1693-11(2017), Section 8)))
	4. Water Absorption due to Capillary Action	BS EN 772-11: 2011)))
	5. Dimensions	BS EN 772-16: 2011)))
4. Concrete Masonry Units	1. Geometrical Characteristics	}	) LJP, SW, JUL)))
	2. Compressive Strength		} SS 271: 1983
	3. Drying Shrinkage		
	4. Total Water Absorption		
	5. Measurement of Dimensions	})))
	6. Compressive Strength		} ASTM C140 / C140M - 20a
	7. Absorption		
K. CERAMIC WALL AND FLOOR TILES	1. Determination of Dimensions	}	) LJP, SW, JUL))
	2. Determination of Straightness of Side		} SS 483: 2000), BS ISO 13006: 2018
	3. Determination of Rectangularity			} (BS EN 14411: 2016) BS EN ISO 10545-2: 2018
	4. Determination of Surface Flatness		
	5. Determination of Surface Quality		
	6. Determination of Resistance to Deep Abrasion		} (SS 483: 2000) BS ISO 13006: 2018 (BS EN 14411: 2016) ISO 10545-6: 2010
	7. Tensile and Shear Adhesion Bond Strength		

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K. CERAMIC WALL AND FLOOR TILES	8. Determination of Modulus of Rapture	(SS 483: 2000) BS ISO 13006: 2018 (BS EN 14411: 2016) ISO 10545-4: 2019) LJP, SW, JUL)))
	9. Determination of Water Absorption	(SS 483: 2000) BS ISO 13006: 2018 (BS EN 14411: 2016) ISO 10545-3: 2018)))))
	10. Determination of Scratch Hardness of Surface	EN 101: 1991 BS 6431 Part 13: 1986 EN 159: 1991 SS 301: 1985 Appendix G)))))
	11. Slip Resistance Test	(SS 483: 2000) BS ISO 13006: 2018 SS 485: 2011 (BS EN 14411: 2016))))))
	12. Reverse Staining	ADM/CE/014: 2011))
	13. Stain Resistance	(SS 483: 2000) BS ISO 13006: 2018 (BS EN 14411: 2016) SS 57: 1989 Appendix H.7 ISO 10545-14: 2015))))))
	14. Chemical Resistance	(SS 483: 2000) BS ISO 13006: 2018 (BS EN 14411: 2016) ISO 10545-13: 2016)))))
	15. Coefficient of Friction	SS 485: 2011))
	16. Sampling and Basic for Acceptance	(SS 483: 2000) BS ISO 13006: 2018 (BS EN 14411: 2016) ISO 10545-1: 2014)))))
	17. Colourfastness	SS 57: 1989 Appendix F SS 301: 1985 Appendix H))

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O. BITUMINOUS PREMIXES	1. Bitumen Content	ASTM D2172 / D2172M – 17e1) LJP, SW, JUL
	2. Density of Premix on Cored Samples	BS 598-104: 2005)
	3. Density of Cored Premix with Sample Preparation	BS 598-104: 2005)
	4. Marshall Density	BS 598-107: 2004 ASTM D1559: 1989))
	5. Marshall Stability	BS 598-107: 2004 ASTM D1559: 1989 ASTM D6927 - 15)))
	6. Particle Size Distribution	BS 812-103.1: 1985 BS EN 933-1: 2012)
	7. Percentage Voids Density of Core Method	BS 598-104: 2005)
	8. Thickness of Core	ASTM D3549/D3549M-18 (Method A) BS EN 12697-36: 2003))
	9. Asphalt Content by Ignition Method	ASTM D6307 - 19)
	10. Los Angeles Abrasion	BS EN 12697-17: 2017)
	11. Measuring Surface Frictional Properties Using the British Pendulum Tester	ASTM E303-93 (2018) SS 589: 2013 BS EN 1436: 2007+A1: 2008 BS EN 13036-4: 2011	) LJP, AC)))
	12. Measuring Pavement Macrotexture Depth Using a Volumetric Technique	ASTM E965 – 15 (2019) BS EN 13036-1: 2010	) LJP)
	13. Preparation of Asphalt Mixture Specimens Using Marshall Apparatus	ASTM D6926 - 20	) LJP, SW, JUL)))
	14. Mechanical Size Analysis of Extracted Aggregate	ASTM D5444 - 15))))
	15. Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures	ASTM D2726 / D2726M - 19))

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O. BITUMINOUS PREMIXES	16. Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures	ASTM D3203 / D3203M - 17) LJP, SW, JUL))))	
	17. Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures	ASTM D2041 / D2041M - 19)))))	
	18. Effect of Moisture on Asphalt Concrete Paving Mixtures	ASTM D4867 / D4867M - 09 (2014))))))	
	19. Determination of Wheel-tracking Rate and Depth	BS 598-110:1998 BS EN 12697-22: 2020))))	
	20. Density of Bituminous Concrete in Place by Nuclear Methods	ASTM D2950/D2950 M- 14	) LJP, SW
P. PRECAST CONCRETE UNITS 1. Concrete Paving Blocks	1. Compressive Strength	}	) LJP, SW, JUL
	2. Visual Aspects and Appearance (Annex J))	
	3. Shape and Dimensions, Thickness of Facing Layer (Annex C))	
	4. Tensile Splitting Strength (Annex F))	
	5. Slip/Skid Resistance (USRV) (Annex I))	
	6. Total Water Absorption (Annex E))	
	2. Concrete Kerb, Channel	1. Water Absorption	})
		2. Transverse Strength)
	3. Slab (Aeration/Porous)	1. Water Absorption	})
		2. Transverse Strength)
	4. Concrete Paving Flags	1. Visual Aspects and Appearance (Annex J)	})
		2. Bending Strength and Breaking Load (Annex F))
		3. Slip/Skid Resistance (USRV) (Annex I))
		4. Total Water Absorption (Annex E))

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5. Concrete Kerb Units	1. Visual Aspects and Appearance (Annex J)	BS EN 1340: 2003) LJP, SW, JUL
	2. Shape and Dimensions, Thickness of Facing Layer (Annex C))
	3. Bending Strength (Annex F))
	4. Slip/Skid Resistance (USRV) (Annex I))
	5. Total Water Absorption (Annex E))
6. Clay Pavers	1. Shape and Dimensions (Annex B)	BS EN 1344: 2013	) LJP, SW, JUL
	2. Transverse Breaking Load (Annex D))
	3. Abrasion Resistance (Annex E))
	4. Slip/Skid Resistance (USRV))
Q. GROUTS Geotechnical Grouting	Specification BS EN 12715: 2000		) LJP, SW, JUL
	1. Bleeding	BS EN 12715: 2000 ASTM C940 - 16)
	2. Setting Time	BS EN 196-3: 2016)
	3. Density by Mud Balance	BS EN ISO 10414-1: 2008)
	4. Marsh Cone Viscosity	BS EN 14117: 2004)
	5. Viscosity & Yield Strength	BS EN ISO 10414-1: 2008)
	6. Workability by Abraham Cone	BS EN 12350-8: 2019)
	7. Penetrability by Filter Pump	BS EN 14497: 2004)
8. Compressive Strength	BS 1377-7: 1990, Section 7 (Load Frame Method))	

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R. SOIL-CEMENT MIXTURE (CEMENT TREATED BASE)	1. Wetting and Drying Compacted Soil-Cement Mixtures	ASTM D559 / D559M - 15) LJP, SW, JUL)
	2. Moisture-Density (Unit Weight) Relations of Soil-Cement Mixtures	ASTM D558 - 19	) LJP, SW, JUL, MAT)
	3. Compressive Strength of Molded Soil-Cement Cylinders	ASTM D1633 - 17))
	4. Measuring Thickness of Concrete Elements Using Drilled Concrete Cores	ASTM C174 / C174M - 17	) LJP, SW, JUL
S. RESILIENT FLOOR COVERINGS	1. Determination of side length, edge, straightness and squareness of tiles	BS EN ISO 24342: 2018	) LJP, SW, JUL
	2. Determination of overall thickness	BS EN ISO 24346: 2012)
	3. Determination of thickness of layers	BS EN ISO 24340: 2012)
	4. Determination of mass per unit area	BS EN ISO 23997: 2012)
	5. Determination of flexibility and deflection	BS EN ISO 24344: 2012 (Method A))
	6. Determination of wear resistance. Frick-Taber test	BS EN 660-2: 1999)
	7. Slip Resistance (dry floor friction & wet pendulum test methods)	SS 485: 2011)
	8. Determination of staining and resistance to chemicals	BS EN ISO 26987: 2012)

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T. DRY WALL	11. Heavyweight anchorage (high level wall cupboard) eccentric downward loading test (Annex L)	SS 492: 2001 (2014) BS 5234-2: 1992) LJP, SW, JUL))
	12. Surface & Total water absorption	BS EN 520:2004+A1:2009 Clause 5.9)
	13. Moisture Movement	ASTM C1185 - 08(2016) Clause 8 BS EN 12467:2012+A2:2018 Annex C)))
	14. Water impermeability	BS EN 12467:2012+A2:2018 Clause 7.3.3))
U. WINDOWS & CURTAIN WALLS	1. Field watertightness test	BCA Conquas 21: 2017, Appendix 2 Part 5 Item 2. SS CP 96: 2002 (2011) Clause 4.3a) LJP

Approved Signatories

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SW : Ms. Sherly Wijaya
JUL : Mr. Julifin
MAT : Ms. Perinpanayagam Mathurathy
WCK : Mr. Wee Chip Kai
AC : Mr. Chuo Chung Hai (Alex)

Note :

This laboratory is accredited in accordance with the recognised International Standard ISO/IEC 17025. A laboratory's fulfilment 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. 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