15 APPENDIX A – SAMPLING AND TESTING FREQUENCIES

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.1 SOIL INVESTIGATION			
15.1.1 Boreholes (for buildings)	AASHTO R13, T87, T146, T206, ASTM D421, D1586, D1587, BS 1377-9, BS 5930, EN1997-2, ISO 14688-1, ISO 14688-2, ISO 14689-1, ISO 22475-1, ISO 22476-2, ISO 22476-3, ISO 22476-12	• Minimum 3 boreholes per site • 1 borehole every 300 m^2 • Grid at a mutual spacing of 20 m	The spacing could be halved for irregular conditions or doubled for uniform conditions. The Engineer shall determine the depth of the borehole.
15.1.2 Boreholes (for highways, bridges, high cuts, culverts, retaining walls etc)	AASHTO R13, T87, T146, T206, ASTM D421, D1586, D1587, BS 1377-9, BS 5930, EN1997-2, ISO 14688-1, ISO 14688-2, ISO 14689-1, ISO 22475-1, ISO 22476-2, ISO 22476-3, ISO 22476-12	• Grid at a mutual spacing of 75 m for subgrade survey • 1 – 3 per pier or abutment • Minimum 3 to draw a profile (high cuts etc) • Grid at a mutual spacing of 30 m for culverts, retaining walls etc	The spacing could be halved for irregular conditions or doubled for uniform conditions. The Engineer shall determine the depth of the borehole.

[1] Footnote 1: The testing frequency stipulated herein shall be mandatory unless otherwise stated. The tests are to be conducted as per the demands of the site as applicable. The same testing sequence and frequency shall be adopted for the recycled materials as applicable.

[2] Footnote 2: All testing will have to be carried out on site or at a designated laboratory irrespective of whether the materials have been tested by the manufacturer or by an intermediate party (such as asphalt, concrete etc supplier) or the availability of the conformity certificates.

[3] Footnote 3: All the reference standards and documents are listed at the end of this table for ease of reference. [Note: Where available/applicable the ASTM version used should be the metric edition, ie, 'M version' (or ASTM D1234M etc).]

[4] Footnote 4: The Contractor shall carry out the maximum number of tests, ie, whichever condition comes first (ie, whichever is more frequent). Sampling and testing frequency may be modified as directed by the Engineer.

[5] Footnote 5: Minimum frequencies shall be deemed to include 'part thereof'. For example; '1 test per 2000 m^2' or '1 test per 50 units' shall be interpreted as '1 test per 2000 m^2 or part thereof' or '1 test per 50 units or part thereof' etc respectively, ie, the Contractor is required to carry out the stipulated testing for amount of work which is less than the mentioned amount.

Material /Section / Activity[1, 2] & the Required Tests		Method[3]	Minimum Frequency[4, 5]	Remarks
15.2	**BENTONITE SLURRY**			
15.2.1	**Density[6]**	API RP 13B-1, ASTM D4380, EN1536	• 2 tests per shift • 2 tests per day	Stage 1
15.2.2	**Viscosity (or Mash Value)[6]**	API RP 13B-1	• 2 tests per shift • 2 tests per day	Stage 1
15.2.3	**Yield Stress[6]**	API RP 13B-1, ASTM 4832	• 2 tests per shift • 2 tests per day	Stage 1
15.2.4	**Gel Strength[6]**	API RP 13B-1, ASTM 4832	• 2 tests per shift • 2 tests per day	Stage 1
15.2.5	**Shear Strength[6]**	API RP 13B-1, ASTM 4832	• 2 tests per shift • 2 tests per day	Stage 1
15.2.6	**Sand Content[6]**	API RP 13B-1, ASTM D4381, EN1536	• 2 tests per shift • 2 tests per day	Stage 1
15.2.7	**Filtrate Loss (also known as Fluid or Filter Loss or Filter Press)[6]**	API RP 13B-1, EN1536	• 2 tests per shift • 2 tests per day	Stage 1
15.2.8	**Bentonite Content[6]**	Weight-Volume	• 2 tests per shift • 2 tests per day	Stage 1
15.2.9	**pH[6]**	API RP 13B-1, EN1536	• 2 tests per shift • 2 tests per day	Stage 1
15.2.10	**Unit Weight[7]**	ASTM D4380	• 2 tests per shift • 2 tests per day	Stage 2
15.2.11	**Viscosity (or Mash Value)[7]**	API RP 13B-1	• 2 tests per shift	Stage 2
15.2.12	**Slump Cone[8]**	AASHTO T119, ASTM C143, EN12350-2	• 2 tests per shift • 2 tests per day	Stage 3
15.2.13	**Gradation[8]**	ASTM D1140 Laboratory or field test	• 1 test per 2000 m^3	Stage 3
15.2.14	**Density (or Unit Weight Test)[8]**	ASTM C138, D4380	• 2 tests per shift • 2 tests per day	Stage 3
15.2.15	**Permeability[8]**	ASTM D5084 Laboratory test	• 1 test per 2000 m3	Stage 3
15.2.16	**Viscosity[8]**	API RP 13B-1	• 2 tests per shift • 2 tests per day	Stage 3

[6] Footnote 6: The Contractor shall carry out these tests for Stage 1 - Initial Bentonite slurry (ie, when the Bentonite is in the form of slurry before its use).

[7] Footnote 7: The Contractor shall carry out these tests for Stage 2 - In-trench Bentonite Slurry (ie, when the Bentonite is in use inside the trench).

[8] Footnote 8: The Contractor shall carry out these tests for Stage 3 - Cement-Bentonite Soil-Bentonite, (backfill) material (ie, when the Bentonite has been used and recovered for reuse).

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.2.17 pH[8]	API RP 13B-1, EN1536	• 2 tests per shift • 2 tests per day	Stage 3
15.2.18 Filtrate Loss (also known as Fluid or Filter Loss or Filter Press)[8]	API RP 13B-1, EN1536	• 2 tests per shift • 2 tests per day	Stage 3
15.2.19 Bentonite Content[8]	Weight-Volume	• 2 tests per shift • 2 tests per day	Stage 3

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.3 PILING			
15.3.1 Static Load Test	ASTM D1143, EN1997-1	• Minimum of 1 test per site • 1% of piles	
15.3.2 Cube Test		• As per concrete testing requirements	
15.3.3 Integrity Test (or Low Strain Integrity Test)	ASTM D5882	• All Piles	
15.3.4 (Crosshole) Sonic Logging Test	ASTM D6760, CIRIA Report 144	• 10-15% of Piles [9]	Refer to footnote
15.3.5 Calliper Logging	ASTM D6167	• 10-15% of Piles	
15.3.6 Dynamic Load Test (or High Strain Dynamic Test)	ASTM D4945	• 5% of piles	
15.3.7 Static Axial Tensile Load Test	ASTM D3689	• As per the Engineer's request	
15.3.8 Lateral Load Test	ASTM D3966	• As per the Engineer's request	

[9] Footnote 9: Piles bigger than 1000mm diameter shall be tested as per this testing requirement (5 vertical access tubes shall be attached at constant spacing to the reinforcement cage of the pile). For smaller diameter piles testing (3 access tubes or as per the Engineer's discretion)

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.4 EARTHWORKS, SUBGRADE, BASE, SUBBASE, BACKFILL, SUB-BALLAST ETC[10, 11]			Refer to footnote
15.4.1 (Modified) Proctor Test - [Optimum Moisture Content (OMC) & Maximum Dry Density (MDD)]	D1557, BS 1377-4	• Each source • (Visible) Change in material • 1 test every 1000 m^3	
15.4.2 Field Density & Field Moisture Content [also known as (Field) Compaction Test][12]	ASTM D1556, D6938, BS 1377-9	• 1 test every 200 m^2 per lift (ie, per compacted layer) • 1 every 75m per lane per layer • 1 test every 20 m of pipe laying or trenching works per lift (ie, per compacted layer)	Refer to footnote
15.4.3 Gradation (Sieve) Analysis[13]	ASTM D6913, EN933-1	• Each source • Visible change in gradation • 1 test every 1000 m^3	Refer to footnote
15.4.4 Atterberg Limits (Index limits) - [Liquid Limit & Plasticity Index]	ASTM D4318, BS 1377-2	• Each source • (Visible) Change in material • 1 test every 1000 m^3	
15.4.5 Shape (Flakiness Index & Elongation Index)[14] Also known as Fractured Faces	D5821	• Each source • (Visible) Change in material • Every change in Job Mix Formula (JMF) • 1 test every 3000 m^3	Refer to footnote
15.4.6 Soundness (or Magnesium Sulphate Test as applicable)	ASTM C88	• Each source • (Visible) Change in material • 1 test every 3000 m^3	

[10] Footnote 11: Earthworks, Subgrade (including porous, prepared etc), Base, Subbase, Backfill (including soil-cement, structural, pipe bedding, trenching, piping, pervious, porous, reclamation backfill etc), Sub-ballast, Common fill, Select fill, Technical fill, Embankment fill, Rock fill, Sabkha rock fill, Gravel, Granular Base (for pavers of all kinds), Setting Bed (for pavers of all kinds) etc and/or products and materials conforming to ASTM D2940 or equivalent shall be tested as per this section requirement where applicable.

[11] Footnote 12: Concrete specifications, testing procedures and frequencies shall be adopted for concrete and concrete related backfill.

[12] Footnote 13: The same testing frequency is to be followed for related backfill works such as manholes, chambers, thrust blocks, skip shaft etc.

[13] Footnote 14: Aggregate gradation standards are included to cater for pervious, porous etc backfill.
[14] Footnote 15: 1 test here refers to 1 pair of tests, ie, 1 test each for Flakiness Index and Elongation Index and/or Fractured Faces as applicable

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.4.7 Water Soluble Sulphate or Acid Soluble Sulphate as applicable[13]	AASHTO T290, ASTM C1580, BS 812-118, BS 1377-3, EN1744-1	• Each source • (Visible) Change in material • 1 test every 3000 m^3	Refer to footnote
15.4.8 Water Soluble Chloride or Acid Soluble Chloride as applicable[13]	BS 1377-3,	• Each source • (Visible) Change in material • 1 test every 3000 m^3	Refer to footnote
15.4.9 Organic Matter Content	BS 1377-3	• Each source • (Visible) Change in material • 1 test every 3000 m^3	
15.4.10 Sand Equivalent	ASTM D2419	• Each source • (Visible) Change in material • 1 test every 1000 m^3	
15.4.11 Los Angeles Abrasion or Aggregate Abrasion Value as applicable	ASTM C131, C535	• Each source • (Visible) Change in material • 1 test every 3000 m^3	
15.4.12 California Bearing Ratio (CBR) test together with the swell criteria[15]	ASTM D1883, D4429, BS1377-4, BS1377-9	• Each source (laboratory testing) • (Visible) Change in material (laboratory testing) • 1 test every 1000 m^3 (laboratory testing) and 1 test every 2000 m^2 on the final layer (in-situ testing)	Refer to footnote
15.4.13 Cone Penetrometer Test[16]	ASTM D3441, D5778, BS 1377-7	• Minimum of 3 tests per site • 1 test every 3000 m^2 after compaction of the final layer	Refer to footnote
15.4.14 Plate Load Test[16]	AASHTO T222, ASTM D1196, BS 1377-9, DIN English 18134	• Minimum of 3 tests per site • 1 test every 3000 m^2 on the final layer	Refer to footnote
15.4.15 Clay Lumps and Friable Particles[16]	ASTM C142	• Each source • (Visible) Change in material • 1 test every 5000 m^3	Refer to footnote
15.4.16 Layer Thickness Verification (Trial Pit)	Refer to Soil Investigation Section	• Minimum of 3 tests per site • 1 test every 3000 m^2 after compaction of the final layer	

[15] Footnote 16: The Contractor may carry out any one of the tests deemed suitable for the site in consultation with the Engineer. The tests are to be repeated separately for each final layer, i.e. subgrade, subbase etc.

[16] Footnote 17: For aggregates used in the pervious, porous backfill etc as applicable.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.4.17 Lightweight Pieces (or Particles) - This includes coal lignite, chert etc.[16]	AASHTO T113, ASTM C33, C123, EN1744-1	• Each source • (Visible) Change in material • 1 test every 5000 m^3	Refer to footnote
15.4.18 Moisture – Density Relations (for Soil-Cement Mixtures etc) as applicable	ASTM D558	• Each source • (Visible) Change in material or gradation • 1 test every 1000 m^3	
~~15.4.19~~ Material Finer than 75 µm	ASTM C117, EN933-1	• Each source • Visible change in gradation • 1 test every 1000 m^3	
15.4.20 Compressive Strength - Soil-Cement Mixtures etc[17]	ASTM D1632, D1633	• As per the Engineer's request	Refer to footnote
15.4.21 Immersed Compressive Strength - Soil-Cement Mixtures etc[18]	ASTM D1632, D1633	• As per the Engineer's request	Refer to footnote
15.4.22 Tensile Strength - Soil-Cement Mixtures etc[17]	ASTM D1632, D1635	• As per the Engineer's request	Refer to footnote
15.4.23 Water Absorption[16]	AASHTO T84, T85, ASTM C127, C128, BS 1377-2, EN1097-3, EN1097-6	• As per the Engineer's request	Refer to footnote
15.4.24 Moisture Content	AASHTO T265, ASTM D2216, D4959, D4643, BS 812-109, BS 1377-2	• As per the Engineer's request	
15.4.25 Loose Bulk Density and Voids[16]	EN1097-3	• As per the Engineer's request	Refer to footnote
15.4.26 Density or Specific Gravity (of Soil)	AASHTO T84, T85, T100, ASTM C127, C128, D854, BS 1377-2	• As per the Engineer's request	
15.4.27 Particle Density (or Unit Weight)	AASHTO T19, ASTM C29, BS 1377-2, EN1097-6	• As per the Engineer's request	
15.4.28 Carbonate Content of Soil	ASTM D4373, BS 1377-3	• As per the Engineer's request	

[17] Footnote 18: Should the Engineer decide to conduct any of these tests, the frequency of testing shall be 2 sets per class per day (each set consisting of 2 specimens each for 7, 28 and 90 day testing).

[18] Footnote 19: Should the Engineer decide to conduct any of these tests, the frequency of testing shall be 2 sets per class per day (each set consisting of 2 specimens for 28 day testing).

Material /Section / Activity[1, 2] & the Required Tests		Method[3]	Minimum Frequency[4, 5]	Remarks
15.4.29	**Shear Strength by Direct Shear (Small Shear Box)**	AASHTO T236, ASTM D3080, BS 1377-7	• As per the Engineer's request	
15.4.30	**Expansion of Aggregates from Hydration Reactions**	ASTM D4792	• As per the Engineer's request	
15.4.31	**Layer Thickness Verification (Light Weight Deflector (LWD)[19]**	ASTM E2583	• As per the Engineer's request	Refer to footnote
15.4.32	**Layer Thickness Verification (Ground Penetrating Radar)[19]**	AASHTO R37, ASTM D6432	• As per the Engineer's request	Refer to footnote
15.4.33	**Layer Thickness Verification (Cone Penetrometer Test)[19]**	ASTM D3441, D5778, BS 1377-7	• As per the Engineer's request	Refer to footnote
15.4.34	**Micro Deval[16]**	AASHTO T327, ASTM D6928, D7428, EN1097-1	• As per the Engineer's request	Refer to footnote
15.4.35	**Consolidation Test**	AASHTO T216, ASTM D2435, BS 1377-5	• As per the Engineer's request	
15.4.36	**Permeability**	In situ test method approved by the Engineer	• As per the Engineer's request	
15.4.37	**Vane Shear in Cohesive Soil**	AASHTO T223	• As per the Engineer's request	
15.4.38	**Soil Resistivity**	ASTM G57, BS 1377-3	• As per the Engineer's request	
15.4.39	**Unconfined Compressive Strength**	ASTM D2166, BS 1377-7	• As per the Engineer's request	
15.4.40 **15.4.41**	**Point Load Strength Index of Rock[20]** **(Also known as Crushing Strength)**	ASTM D5731	• As per the Engineer's request	Refer to footnote
15.4.42	**Compressive Strength and Elastic Moduli of Intact Rock[20] (Also known as Crushing Strength)**	ASTM D7012 Sampling to be done in accordance with ASTM D4543 or equivalent	• As per the Engineer's request	Refer to footnote

[19] Footnote 20: Should the Engineer decide to conduct any of these tests, the frequency of testing shall be 'Minimum of 3 tests per site' or '1 test every 3000 m^2 after compaction of final layer' whichever comes first.

[20] Footnote 21: Should the Engineer decide to conduct any of these tests, the frequency of testing shall be 'Minimum of 3 tests per site' or '1 test every 1000 m^2' whichever comes first.

Material /Section / Activity[1, 2] & the Required Tests		Method[3]	Minimum Frequency[4, 5]	Remarks
15.4.43	**Cement Bound Granular Mixtures & Soil Treated by Cement (Hydraulically Bound Mixtures)**	EN14227-1, EN14227-10	• As per the Engineer's request	
15.4.44	**Soil Treated by Lime (Unbound and Hydraulically Bound Mixtures)**	EN14227-11	• As per the Engineer's request	
15.4.45	**Slag Bound Mixtures & Soil Treated by Slag (Hydraulically Bound Mixtures)**	EN14227-2, EN14227-12	• As per the Engineer's request	
15.4.46	**Hydraulic Road Binder Bound Mixtures & Soil Treated by Hydraulic Road Binder (Hydraulically Bound Mixtures)**	EN14227-5, EN14227-13	• As per the Engineer's request	
15.4.47	**Fly Ash Bound Mixtures, Fly Ash for Hydraulically Bound Mixtures & Soil Treated by Fly Ash (Hydraulically Bound Mixtures)**	EN14227-3, EN14227-4, EN14227-14	• As per the Engineer's request	
15.4.48	**Alpha Coefficient of Vitrified Blast Furnace Slag**	EN13286-44	• As per the Engineer's request	
15.4.49	**Clay Liner Plates**	ASTM C479	• As per the Engineer's request	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.5 AGGREGATES –, CONCRETE LIGHTWEIGHT ETC[21, 22, 23, 24]			Refer to footnote
15.5.1 Gradation (Sieve) Analysis	AASHTO T27, ASTM C33, C136, EN933-1, EN12620	• Each source • Visible change in gradation • Every change in Job Mix Formula (JMF) • 1 test daily • 1 test every 1000 m^3	
~~15.5.2~~ Material Finer than 75 µm	AASHTO T11, ASTM C117, EN933-1	• Each source • Visible change in gradation • 1 test daily • 1 test every 1000 m^3	
15.5.3 Clay Lumps and Friable Particles	AASHTO T112, ASTM C142	• Each source • (Visible) Change in material • 1 test weekly • 1 test every 4000 m^3	
15.5.4 Lightweight Pieces (or Particles) This includes coal lignite, chert etc	AASHTO T113, ASTM C33, C123, EN1744-1	• Each source • (Visible) Change in material • 1 test weekly • 1 test every 4000 m^3	
15.5.5 Organic Impurities	AASHTO T21, T71, ASTM C40, C87, EN1744-1	• Each source • (Visible) Change in material • 1 test monthly • 1 test every 16000 m^3	
15.5.6 Water Absorption (Saturated Surface Dry)	AASHTO T84, 85, ASTM C127, C128, EN1097-6	• Each source • (Visible) Change in material • 1 test daily • 1 test every 1000 m^3	

[21] Footnote 22: Aggregates which are to be used for concrete, asphalt, masonry (ASTM C144) and tiling work, Shotcrete, track ballast, grout, masonry grout (ASTM C404) etc as applicable. The testing shall be carried out separately for each separate material or item (ie, coarse, fine etc) and the frequency of testing adhered to in each case mutually.

[22] Footnote 23: This includes dune sand, washed sand, air-cooled blast furnace slag aggregate, lightweight aggregate, crushed materials which are used for the above listed or similar purposes.

[23] Footnote 24: Where applicable this testing frequency is to be used for rock, bolder etc testing, or when rocks are used as backfill material as in shoreline etc works.

[24] Footnote 25: Sampling shall be done in accordance with AASHTO T2, T248, ASTM C50, C702, D75, D3665, EN932-1 or equivalent as applicable.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.5.7 Sand Equivalent	AASHTO T176, ASTM D2419, EN933-8	• Each source • (Visible) Change in material • 1 test weekly • 1 test every 4000 m^3 for each fine aggregate type • 1 test every 4000 m^3 for bituminous paving courses or mixtures (the total amount)	
15.5.8 Specific Gravity (Apparent) or Bulk Specific Gravity or Unit Weight (Bulk Density) or Particle Density or Relative Density as applicable	AASHTO T84, 85, ASTM C127, C128, EN1097-6	• Each source • (Visible) Change in material • 1 test daily • 1 test every 1000 m^3	
15.5.9 Loose Bulk Density and Voids	EN1097-3	• Each source • (Visible) Change in material • 1 test daily • 1 test every 1000 m^3	
15.5.10 Moisture Content or Water Content as applicable	AASHTO T255, ASTM C70, C566, BS 812-109, EN1097-5	• Each source • Change in material • 1 test daily • 1 test every 1000 m^3	
15.5.11 Shell Content	EN933-7	• Each source • (Visible) Change in material • 1 test weekly • 1 test every 4000 m^3	
15.5.12 Shape (Flakiness Index & Elongation Index) Also known as Fractured Faces	AASHTO T304, ASTM C1252, D5821, BS 812-105.1, BS 812-105.2, EN933-3, EN933-4 (ASTM D3398, D4791 may also be used as applicable)	• Each source • (Visible) Change in material • Every change in Job Mix Formula (JMF) • 1 test weekly • 1 test every 4000 m^3	1 test here refers to 1 pair of tests, ie, 1 test each for Flakiness Index and Elongation Index and/or Fractured Faces as applicable
15.5.13 Water Soluble Sulphate or Acid Soluble Sulphate as applicable	AASHTO T290, ASTM C1580, BS 812-118, BS 1377-3, EN1744-1	• Each source • (Visible) Change in material • 1 test weekly • 1 test every 4000 m^3	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.5.14 Water Soluble Chloride or Acid Soluble Chloride as applicable	AASHTO T291, ASTM C1152, C1218, BS 812-117, BS 1377-3, EN1744-1, EN1744-5	• Each source • (Visible) Change in material • 1 test weekly • 1 test every 4000 m^3	
15.5.15 Soundness (or Magnesium Sulphate Test as applicable)	AASHTO T104, ASTM C88, BS 812-121, EN1367-2	• Each source • (Visible) Change in material • 1 test weekly • 1 test every 4000 m^3	
15.5.16 Los Angeles Abrasion or Aggregate Abrasion Value as applicable	AASHTO T96, ASTM C131, C535, EN1097-2	• Each source • (Visible) Change in material • 1 test weekly • 1 test every 4000 m^3	
15.5.17 10% Fines Value	BS 812-111, EN1097-2	• Each source • (Visible) Change in material • 1 test weekly • 1 test every 4000 m^3	
15.5.18 Aggregate Impact Value	BS 812-112, EN1097-2	• Each source • (Visible) Change in material • 1 test weekly • 1 test every 4000 m^3	
15.5.19 Aggregate Crushing Value	BS 812-110, EN1097-2	• Each source • (Visible) Change in material • 1 test weekly • 1 test every 4000 m^3	
15.5.20 Drying Shrinkage	EN1367-4	• Each source • (Visible) Change in material • 1 test yearly • 1 test every 200000 m^3	
15.5.21 Potential Reactivity (Alkali-Silica, Alkali-Carbonation, Cement-Aggregate combination etc)	AASHTO T299, ASTM C227, C289, C586, C1260, C1567	• Each source • (Visible) Change in material • 1 test monthly • 1 test every 16000 m^3	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.5.22 Plasticity Index	AASHTO T89, T90, ASTM D4318, BS 1377-2	• Each source • (Visible) Change in material • 1 test weekly • 1 test every 4000 m^3 • 1 test every 4000 m^3 (in the case of combined aggregate for bituminous paving courses etc as applicable)	
15.5.23 Filler, Mineral Filler (for Bituminous Paving Course – AASHTO M17 or ASTM C51 etc applicable)	AASHTO T37, ASTM D242, D546, EN197-1, EN1744-4	• Each source • (Visible) Change in material • Every change in Job Mix Formula (JMF) • 1 test weekly • 1 test every 4000 m^3	
15.5.24 Density - Lightweight Aggregates	ASTM C330, EN13055-1, EN13055-2	• Each source • Change in material • 1 test per month	
15.5.25 Physical Properties - Lightweight Aggregates	ASTM C330, EN13055-1, EN13055-2	• Each source • Change in material • 1 test per month	
15.5.26 Constituents of Coarse Recycled Aggregates[25]	EN933-11	• Each source • Change in material • 1 test per month	Refer to footnote
15.5.27 Influence of Recycled Aggregate Extract on the Initial Setting Time of Cement[26]	EN1744-6	• Each source • Change in material • 1 test per month	Refer to footnote
15.5.28 Polished Stone Value	EN1097-8	• As per the Engineer's request	
15.5.29 pH Value	BS 1377-3	• As per the Engineer's request	
15.5.30 Methylene Blue Value	EN933-9	• As per the Engineer's request	
15.5.31 Micro Deval Coefficient	AASHTO T327, ASTM D6928, D7428, EN1097-1	• As per the Engineer's request	
15.5.32 Iron Staining	ASTM C641	• As per the Engineer's request	
15.5.33 Surface Moisture Content in Fine Aggregate (Chapman Flask)	ASTM C70, EN933-8	• As per the Engineer's request	

[25] Footnote 26: In the case of use of Recycled Aggregates, this test is to be carried out in addition to the tests (physical & chemical properties) stipulated for the normal aggregates as per this section requirement.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.5.34 Chemical Analysis of Limestone, Quicklime, and Hydrated Lime	ASTM C25	• As per the Engineer's request	
15.5.35 Petrographic Analysis	ASTM C295, EN932-3	• As per the Engineer's request	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.6 AGGREGATES – COARSE, FINE, MINERAL FILLER, (ASPHALT WORKS) [26] [27] [28] [29]			Refer to footnote
15.6.1 Gradation (Sieve) Analysis	ASTM C136	• Each source • Visible change in gradation • Every change in Job Mix Formula (JMF) • 1 test daily • 1 test every 2000 m^3	
~~**15.6.2**~~ **Material Finer than 75 µm**	ASTM C117	• Each source • Visible change in gradation • 1 test daily • 1 test every 2000 m^3	
15.6.3 Clay Lumps and Friable Particles	ASTM C142	• Each source • (Visible) Change in material • 1 test weekly • 1 test every 2000 m^3	
15.6.4 Organic Impurities	ASTM C40	• Each source • (Visible) Change in material • 1 test monthly • 1 test every 2000 m^3	
15.6.5 Water Absorption (Saturated Surface Dry)	ASTM C127, C128	• Each source • (Visible) Change in material • 1 test daily • 1 test every 2000 m^3	
15.6.6 Sand Equivalent	ASTM D2419	• Each source • (Visible) Change in material • 1 test every 2000 m^3 for bituminous paving courses or mixtures (the total amount)	

[26] Footnote 27: Aggregates which are to be used for concrete, asphalt, masonry (ASTM C144) and tiling work, Shotcrete, track ballast, grout, masonry grout (ASTM C404) etc as applicable. The testing shall be carried out separately for each separate material or item (ie, coarse, fine etc) and the frequency of testing adhered to in each case mutually.

[27] Footnote 28: This includes dune sand, washed sand, air-cooled blast furnace slag aggregate, lightweight aggregate, crushed materials which are used for the above listed or similar purposes.

[28] Footnote 29: Where applicable this testing frequency is to be used for rock, bolder etc testing, or when rocks are used as backfill material as in shoreline etc works.

[29] Footnote 30: Sampling shall be done in accordance with AASHTO T2, T248, ASTM C50, C702, D75, D3665, EN932-1 or equivalent as applicable

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.6.7 Specific Gravity (Apparent) or Bulk Specific Gravity or Unit Weight (Bulk Density) or Particle Density or Relative Density as applicable	ASTM C127, C128	• Each source • (Visible) Change in material • 1 test daily • 1 test every 2000 m^3	
15.6.8 Moisture Content or Water Content as applicable	AASHTO T255, ASTM C70, C566, BS 812-109, EN1097-5	• Each source • Change in material • 1 test daily • 1 test every 2000 m^3	
15.6.9 Shape (Flakiness Index & Elongation Index) and Fractured Faces	ASTM D4791, D5821,	• Each source • (Visible) Change in material • Every change in Job Mix Formula (JMF) • 1 test weekly • 1 test every 2000 m^3	1 test here refers to 1 pair of tests, ie, 1 test each for Flakiness Index and Elongation Index and/or Fractured Faces as applicable
15.6.10 Acid Soluble Sulphate	BS 1377-3	• Each source • (Visible) Change in material • 1 test weekly • 1 test every 2000 m^3	
15.6.11 Acid Soluble Chloride	BS 1377-3	• Each source • (Visible) Change in material • 1 test weekly • 1 test every 2000 m^3	
15.6.12 Soundness (Magnesium Sulphate)	ASTM C88	• Each source • (Visible) Change in material • 1 test weekly • 1 test every 2000 m^3	
15.6.13 Los Angeles Abrasion or	ASTM C131, C535	• Each source • (Visible) Change in material • 1 test weekly • 1 test every 2000 m^3	
15.6.14 Aggregate Crushing Value	BS 812-110	• Each source • (Visible) Change in material • 1 test weekly • 1 test every 2000 m^3	
15.6.15 Plasticity Index	ASTM D4318	• Each source • (Visible) Change in material • 1 test weekly • 1 test every 2000 m^3	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.6.16 Filler, Mineral Filler for Bituminous Paving Courses	AASHTO T37, ASTM D242, D546, EN197-1, EN1744-4	• Each source • (Visible) Change in material • Every change in Job Mix Formula (JMF) • 1 test weekly • 1 test every 300t	
15.6.17 Petrographic Analysis	ASTM C295, EN932-3	• As per the Engineer's request	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.7 GROUTS[30]			Refer to footnote
15.7.1 Mix Proportion	EN445	• Each mix • Change in mix • 1 test per 25m^3	
15.7.2 Fresh Density	EN445	• Each mix • Change in mix • 1 test per 25 m^3	
15.7.3 Fluid Density (Cone Method)	EN445	• Each mix • Change in mix • 1 test per 25 m^3	
15.7.4 Bleeding Test	ASTM C940, EN445	• Each mix • Change in mix • 1 test per 25 m^3	
15.7.5 Volume Change, Vertical Shrinkage (Change in Height), Expansion/Shrinkage	ASTM C827, C940, EN445	• Each mix • Change in mix • 1 test per 25 m^3	
15.7.6 Compressive Strength Test	ASTM C109, C942, EN196-1, EN445	• Each mix • Change in mix • 1 test per 25 m^3	
15.7.7 Workability	EN13395-1, EN13395-2, EN13395-3, EN13395-4	• Each mix • Change in mix • 1 test per 25 m^3	
15.7.8 Ground Granulated Blast-Furnace Slag	Refer to Cement Section	• Refer to Cement Section	
15.7.9 Flow Consistency	ASTM C939, C1437, BS 4551	• Each mix • Change in mix • 1 test per 25 m^3	
15.7.10 Setting Time (Initial & Final Set)	ASTM C953, EN196-3	• Each mix • Change in mix • 1 test per 25 m^3	
15.7.11 Bond Strength (at 28 days)	EN12615	• Each mix • Change in mix • 1 test per 25 m^3	
15.7.12 Grout coring and compressive strength testing required where grouting is for increasing soil or rock strength	Sampling and Testing Methods and Programmes are to be proposed by the Contractor Engineer's approval	• Frequency to be proposed by the Contractor for Engineer's approval	

[30] Footnote 36: All grouts including Portland cement non-shrink grouts (used for pressure grouting, semi-precast construction, prestressing construction etc) and/or products conforming to EN447 or equivalent shall be tested in accordance with this section requirement as applicable.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.8 BITUMINOUS (ASPHALT) CONCRETE PAVEMENT, PRIME COAT, BITUMEN etc.[31, 32, 33, 34]			Refer to footnote
15.8.1 Field Density and Pavement Thickness (using cores)[35]	ASTM D3549, EN12697-29, EN12697-36	• 1 test per 200t per layer for Base Course • 1 test per 100t per layer for Wearing Course	Refer to footnote
15.8.2 Extraction and Gradation of Bituminous Concrete Mix and Determination of Binder Content (or Asphalt Content) Also known as Mechanical Analysis of Extracted Aggregate	AASHTO T30, T37, T164, T168, T308, ASTM C136, D546, D2172, D5444, D6307, EN933-1, EN12697-1, EN12697-2, EN12697-39	• 1 test per day • 1 test per 300 t of asphalt mix • Every change in Job Mix Formula (JMF)	
15.8.3 Maximum Specific Gravity (GMM, ST)	ASTM D2041, EN12697-5	• 1 test per day • 1 test per 300 t of asphalt mix • Every change in Job Mix Formula (JMF)	

[31] Footnote 37: The terms Bitumen and/or Asphalt refers to any material with the similar characteristic as the common bitumen and/or asphalt. Hence all tests mentioned regarding bitumen and/or asphalt shall be carried out for any material with the similar characteristics as bitumen and/or asphalt at the specified frequency.

[32] Footnote 38 Bitumen testing will have to be carried out by the Contractor at the specified frequency, irrespective of the fact whether the same tests have been carried out by the bitumen manufacturer or supplier.

[33] Footnote 39: Sampling of material and preparation of samples shall be in accordance with AASHTO T2, T40, T168, T248, ASTM C702, D140, D979, EN58 (BS 2000-474), EN12594 (BS 2000-461), EN12697-27, EN12697-28, EN12697-29, EN12697-30, EN12697-33 or equivalent as applicable.

[34] Footnote 40: Materials conforming to Asphalt Binder (ASTM D946), Prime Coat Cutback Asphalt – Slow Curing Type (ASTM D2026), Medium Curing Type (AASHTO M82, ASTM D2027), Rapid Curing Type (AASHTO M81, ASTM D2028), Tack Coat Emulsified Asphalt (AASHTO M140, ASTM M208, D977, D2397, BS 434-1), Viscosity-Graded Asphalt Cement (AASHTO M226, ASTM D3381), Penetration Graded Asphalt Cement (AASHTO M20), Prime Coat, Bitumen Binder of all penetration grades, Paving Grade Bitumens (EN12591), Hard Paving Grade Bitumens (EN13924), Cutback Bitumen (EN15322), Polymer Modified Bitumens (EN14023), Oxidised Bitumens (EN13304), Hard Industrial Bitumens (EN13305) etc or equivalent as applicable.

[35] Footnote 41: 1 test (or 1 sample) refers to a pair of adjacent cores (150 mm diameter for intermediate and base course and 100 mm diameter for wearing course). If asphalt is layed in two or more layers for any of the course, the coring and testing shall be completed for the first layer before the commencement of asphalt laying for the subsequent layer(s).

Material /Section / Activity[1, 2] & the Required Tests		Method[3]	Minimum Frequency[4, 5]	Remarks
15.8.4	**Marshall Properties of Bituminous Concrete Mix (Stability, Flow, Air Voids, VMA) & Loss of Marshall Stability**	AI MS-2, AASHTO T166, T209, T245, T269, T275, ASTM D1188, D2041, D2726, D3203, D6926, D6927, EN12697-5, EN12697-6, EN12697-8, EN12697-29, EN12697-34, EN12697-35	• 1 test per day • 1 test per 300 t of asphalt mix	
15.8.5	**Bitumen (Prime Coat, Tack Coat etc) – Rate of Application**	ASTM D2995	• Each source • Change in material • 1 per 250 m^2 • 1 every 75m per lane	
15.8.6	**Penetration of Bitumen & Penetration of Residue (Also known as Needle Penetration)**	ASTM D5	• Each source • Each batch • Change in material • 1 test per 75 t of bitumen	
15.8.7	**Flash Point of Bitumen**	AASHTO T48, ASTM D92, D3143, ISO 2592 (BS 2000-36), ISO 2719 (BS 2000-34)	• Each source • Change in material • 1 test per 450 t of bitumen	
15.8.8	**Solubility of Bitumen**	AASHTO T44, ASTM D2042, EN12592	• Each source • Change in material • 1 test per 450 t of bitumen	
15.8.9	**Ductility of Bitumen & Ductility of Residue**	ASTM D113	• Each source • Change in material • 1 test per 450 t of bitumen	
15.8.10	**Rolling Thin Film Oven Test (RTFOT) & Mass Loss – Effects of Short-Term Ageing (Also known as Effect of Heat and Air on a Moving Film of Asphalt)**	ASTM D2872	• Each source • Change in material • 1 test per 450 t of bitumen	It is sufficient to carry out either TFOT or RTFOT.
15.8.11	**Softening Point of Bitumen (Ring & Ball) – Temperature Susceptibility**	ASTM D36	• Each source • Each batch • Change in material • 1 test per 75 t of bitumen	

Material /Section / Activity[1, 2] & the Required Tests		Method[3]	Minimum Frequency[4, 5]	Remarks
15.8.12	**Kinematic Viscosity of Bitumen**	AASHTO T201, ASTM D445, D2170, EN12595 (BS 2000-319)	• Each source • Change in material • 1 test per 500 t of bitumen	
15.8.13	**Determination of Water in Bitumen**	AASHTO T55, ASTM D95	• Each source • Change in material • 1 test per 500 t of bitumen	
15.8.14	**Compaction and Shear Properties of Bituminous Mixtures**	ASTM D3387	• As per the Engineer's request	
15.8.15	**Effect of Water on Compressive Strength of Bituminous Mixtures (Also known as Loss of Stability Test)**	AASHTO T165, ASTM D1075	• As per the Engineer's request	
15.8.16	**Layer Thickness Verification (Falling Weight Deflectometer - FWD)[36]**	AASHTO R32, ASTM D4694, D5858	• Minimum of 3 tests per site • 1 test every 3000 m^2 after compaction of the final layer	Refer to footnote
15.8.17	**Layer Thickness Verification (Ground Penetrating Radar)[42]**	AASHTO R37, ASTM D6087, D6432	• Minimum of 3 tests per site • 1 test every 3000 m^2 after compaction of the final layer	Refer to footnote
15.8.18	**Layer Thickness Verification (Trial Pit)[37]**	BS 5930 or In situ test method approved by the Engineer	• As per the Engineer's request	Refer to footnote
15.8.19	**Layer Thickness Verification (Cone Penetrometer Test)[43]**	ASTM D3441, D5778	• As per the Engineer's request	Refer to footnote
15.8.20	**Layer Thickness (Volumetric Patch Technique)[43]**	EN13036-1	• As per the Engineer's request	Refer to footnote

[36] Footnote 42: The Contractor may carry out any one of the tests deemed suitable for the site in consultation with the Engineer.

[37] Footnote 43: Should the Engineer decide to conduct any of these tests, the frequency of testing shall be 'Minimum of 3 tests per site' or '1 test every 3000 m^2 after compaction of the final layer' whichever comes first.

Material /Section / Activity[1, 2] & the Required Tests		Method[3]	Minimum Frequency[4, 5]	Remarks
15.8.21	**Layer Thickness Verification (Light Weight Deflector (LWD)[43]**	ASTM E2583	• As per the Engineer's request	Refer to footnote
15.8.22	**International Roughness Index - IRI (Ride Quality) using Multi Laser Profiler (MLP)**	ASTM E950, E1170, E1926	• Each lane of the road throughout the full length of the road	
15.8.23	**Ride Quality, Smoothness (using 3m straight edge)**	AASHTO R40	• 1 test every 15 m per lane (longitudinal and transverse)	Measurements are to be taken longitudinally and transversely
15.8.24	**Rolling Straight Edge Test (Also known as Measurement of Pavement Deflection)**	AASHTO T256, ASTM D4695	• 1 complete lane (full length of the road) per carriage way in each traffic direction	
15.8.25	**Slip/Skip Resistance of Surface**	ASTM E2340	• As per the Engineer's request	
15.8.26	**Water Sensitivity Test (Lottman Test) Also known as Tensile Strength Ratio Test**	AASHTO T283, ASTM D4867	• As per the Engineer's request	
15.8.27	**Elastic Recovery of Modified Bitumen (Ductility)**	AASHTO T301, ASTM D6084	• Each source • Each batch • Change in material • 1 test per 450 t of bitumen	Specific for elastomer or blend of elastomer-plastomer polymers
15.8.28	**Accelerated Aging Using Pressure Aging Vessel (PAV) for Modified Bitumen – Effects of Long-Term Ageing**	AASHTO R28, ASTM D6521	• Each source • Each batch • Change in material • 1 test per 450 t of bitumen	Specific for plastomer type polymers
15.8.29	**Flexural Creep Stiffness of Modified Bitumen – Bending Beam Rheometer (BBR) Also known as Low Temperature Flexibility**	AASHTO T313, ASTM D6648	• Each source • Each batch • Change in material • 1 test per 450 t of bitumen	Specific for plastomer type polymers It is sufficient to carry out either BBR or DTT.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.8.30 Fracture Properties of Modified Bitumen – Direct Tension Test (DTT)	AASHTO T314	• Each source • Each batch • Change in material • 1 test per 450 t of bitumen	Specific for plastomer type polymers It is sufficient to carry out either BBR or DTT.
15.8.31 Rheological Properties of Modified Bitumen – Dynamic Shear Rheometer (DSR)	AASHTO T315, ASTM D7175	• Each source • Each batch • Change in material • 1 test per 450 t of bitumen	
15.8.32 Storage Stability of Modified Bitumen	AASHTO T316, ASTM D4402	• As per the Engineer's request	
15.8.33 Dynamic Viscosity of Bitumen	AASHTO T316, ASTM D4402	• As per the Engineer's request	
15.8.34 Flash Point by Pensky-Martens	ASTM D93	• As per the Engineer's request	
15.8.35 Specific Gravity of Semi-Solid Bituminous Material (Pycnometer Method)	AASHTO T228, ASTM D70	• As per the Engineer's request	
15.8.36 Rate of Spread of Coated Chippings	BS 598-1	• As per the Engineer's request	
15.8.37 Viscosity - Bitumen, Asphalt (Vacuum Capillary Viscometer, Saybolt, Saybolt Fural, Cone & Plate)	AASHTO T202, ASTM D88, D2171, D3205, E102	• As per the Engineer's request	
15.8.38 Sealants and Fillers for Joints and Cracks in Pavements	ASTM D5329	• As per the Engineer's request	
15.8.39 Quality Control for Asphalt Manufacturing Plants	ASTM D4561	• As per the Engineer's request	
15.8.40 Requirements for Agencies Testing and Inspecting Road and Paving Materials	ASTM D3666	• As per the Engineer's request	

Material /Section / Activity[1, 2] & the Required Tests		Method[3]	Minimum Frequency[4, 5]	Remarks
15.8.41	**Spot Test of Asphaltic Materials**	AASHTO T102	• As per the Engineer's request	
15.8.42	**Determination of Cement Content in Cement-Treated Aggregate**	AASHTO T211	• As per the Engineer's request	
15.8.43	**Testing Lime for Chemical Constituents and Particle Sizes**	AASHTO T219	• As per the Engineer's request	
15.8.44	**Temperature Measurement - Asphalt Mix**	EN12697-13	• Each Truck[38]	Refer to footnote
15.8.45	**Resistance to Plastic Flow**	ASTM D5581	• As per the Engineer's request	
15.8.46	**Determination of a Volatile Distillate Fraction - Cold Asphalt Mixtures**	ASTM D6627	• As per the Engineer's request	
15.8.47	**Moisture or Volatile Distillates - Bituminous Paving Mixtures**	ASTM D1461	• As per the Engineer's request	
15.8.48	**Asphalt Content - Bituminous Mixtures by the Nuclear Method**	ASTM D4125	• As per the Engineer's request	
15.8.49	**Accelerated Weathering - Bituminous Materials**	ASTM D4798, 4799	• As per the Engineer's request	

[38] Footnote 44: The temperature of the hot asphalt shall be measured for each truck load before the asphalt is deposited into the hopper. The temperature for the same asphalt truck load shall be checked again before the compaction (ie, after it has been through the feeder and on the ground ready for compaction).

Material /Section / Activity[1, 2] & the Required Tests		Method[3]	Minimum Frequency[4, 5]	Remarks
15.9	**REINFORCING STEEL, COUPLERS, WELDED FABRIC[39, 40]**			Refer to footnote
15.9.1	**Tensile Test**	ASTM A370, E8, BS 4449, ISO 6892-1, ISO 15630-1	• 1 test per 30 t (3 test pieces per diameter)	
15.9.2	**Bend Test**	ASTM A370, E290, BS 4449, ISO 6892-1, ISO 15630-1	• 1 test per 30 t (1 test pieces per diameter)	
15.9.3	**Re-bend Test**	ASTM A370, E290, BS 4449, ISO 6892-1, ISO 15630-1	• 1 test per 30 t (1 test pieces per diameter)	
15.9.4	**Chemical Composition**	ASTM A370, A751, E350, BS 4449, ISO 15630-1	• 1 test per 100 t (2 test pieces)	
15.9.5	**Mechanical Couplers, Splices for Reinforcement Bars**	ASTM A370, A1034, BS 4449, ISO 6892-1, ISO 15630-1, ISO 15835-2	• 1 test per 100 splices • If 3 consecutive tests prove satisfactory, frequency may be reduced to 1 test per 250 splices	
15.9.6	**Welded Fabric[41]**	AWS D1.4, ISO 15630-2	• Each source • Change in source	Refer to footnote
15.9.7	**Rib Geometry**	ASTM A370, BS 4449, ISO 15630-1	• As per the Engineer's request	
15.9.8	**Compression - Metallic Materials**	ASTM E9	• As per the Engineer's request	
15.9.9	**Hardness (Brinell, Rockwell, Indentation) - Metallic Materials**	ASTM E10, E18, E110, ISO 6506-1, ISO 6508-1	• As per the Engineer's request	
15.9.10	**Tests for Stainless Steel Bars**	BS 6744	• As per the Engineer's request	

[39] Footnote 45: Reinforcement bars (BS 4482, 4483 etc), coils etc shall be tested as per this section requirement.

[40] Footnote 46: All the mandatory testing will have to be carried out by the Contractor at the specified frequency, irrespective of the fact whether the same tests have been carried out by the steel manufacturer or supplier and whether the mill certificate is available or not.

[41] Footnote 47: These tests will have to be carried out in addition to the tests stipulated for steel bars (and the stipulated frequency) as per this section requirement.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.10 STRUCTURAL STEEL, WELDING[42]			Refer to footnote
15.10.1 Tensile	ASTM A370, E8, EN10025-1	• 1 test per 20 t for hot rolled products • 1 test per 40 t for cast products • 1 test per 60 t for heavy sections (>100 kg / m) • 1 test per 80 t for sections / products greater than 200 t	
15.10.2 Chemical Analysis	ASTM A370, A751, E350, E351, EN10025-1	• 1 test per 20 t for hot rolled products • 1 test per 40 t for cast products • 1 test per 60 t for heavy sections (>100 kg / m) • 1 test per 80 t for sections / products greater than 200 t	
15.10.3 Hardness	ASTM A370, EN10025-1	• 1 test per 20 t for hot rolled products • 1 test per 40 t for cast products • 1 test per 60 t for heavy sections (>100 kg / m) • 1 test per 80 t for sections / products greater than 200 t	
15.10.4 Notched Bar Impact Test (Also known as Charpy Pendulum Impact Test or Charpy V-notch Test)[43]	ASTM E23, ASTM E812, ISO 148-1, EN10045-1	• 1 test per 20 t for hot rolled products • 1 test per 40 t for cast products • 1 test per 60 t for heavy sections (>100 kg / m) • 1 test per 80 t for sections / products greater than 200 t	Refer to footnote
15.10.5 Izod Impact Strength Test	BS 131-1	• As per the Engineer's request	

[42] Footnote 48: Materials conforming to ASTM A36 or equivalent shall be tested as per this section requirement.
[43] Footnote 49: Sampling shall be done in accordance with ASTM A673 or equivalent as applicable.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.10.6 Ultrasonic Test[44] - Welds	AWS D1.1, EN12517-1, EN15617, ISO 10863, ISO 11666, ISO 17640, ISO 22825, ISO 23279	• 20% of welded length	Refer to footnote
15.10.7 Radiographic, Digital Radiographic Test[51] - Welds	AWS D1.1, EN1435, EN12517-2, ISO 10893-6, ISO 10893-7	• 20% of welded length	Refer to footnote
15.10.8 Magnetic Particle Test[45] - Welds	AWS D1.1, ASTM E125, E1444, ISO 9934-1, ISO 17638, ISO 23278	• 20% of welded length	Refer to footnote
15.10.9 Penetrating Test, Liquid Penetrant[51] - Welds	AWS D1.1, ASTM E165, EN571-1, ISO 3059, ISO 23277	• 20% of welded length	Refer to footnote
15.10.10 Visual Test - Fusion Welding	AWS D1.1, ISO 17637	• 100% of welded length	
15.10.11 Automated Ultrasonic Test - Welded Seam of Steel Tubes	ISO 10893-11	• 100% of welded length	
15.10.12 Welding Procedure Test	ISO 15614-1, 15614-2, 15614-3, 15614-4, 15614-5, 15614-6, 15614-7, 15614-8, 15614-10, 15614-11, 15164-12, 15614-13	• 1 per condition per site	Welded Coupon
15.10.13 Bend Test - Ductility of Welds	ASTM E190	• As per the Engineer's request	
15.10.14 Transverse Tensile Test - Welds	ISO 4136	• As per the Engineer's request	
15.10.15 Bend Test - Welds	ISO 5173	• As per the Engineer's request	

[44] Footnote 50: It is sufficient for the Contractor to carry out either the Ultrasonic Test or the Radiographic Test, whichever is deemed suitable for the site in consultation with the Engineer. It may be better to choose Ultrasonic Test for structural steel. The Engineer has the right to choose the testing frequency specified in any of the relevant codes.

[45] Footnote 51: It is sufficient for the Contractor to carry out either the Magnetic Particle Test or the Penetrating Test, whichever is deemed suitable for the site in consultation with the Engineer. It may be better to choose Magnetic Particle Test for Carbon Steel. The Engineer has the right to choose the testing frequency specified in any of the relevant codes.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.10.16 Impact Test - Welds	ISO 9016	• As per the Engineer's request	
15.10.17 Hardness Test - Welds	ISO 9015-1, ISO 9015-2	• As per the Engineer's request	
15.10.18 Macroscopic & Microscopic Inspection - Welds	EN1321	• As per the Engineer's request	
15.10.19 Acoustic Emission Test - Welds	ASTM E749, E751	• As per the Engineer's request	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.11 PRESTRESSING STEEL, SHEATHS, ANCHORAGES, COUPLERS[46]			Refer to footnote
15.11.1 Tension, Yield, Elongation, Break Strength - Steel Wire, Strand, Rod	ASTM A370, A931, A1061, E8, BS 5896, ISO 15630-3	• 1 test for each reel of wire or strand • 1 test per 1000 m of wire or strand • 1 test per 30 t for each rod size	
15.11.2 Relaxation - Steel Wire, Strand, Rod	ASTM E328, BS 5896, ISO 15630-3	• 1 test for each batch/lot of wire or strand • 1 test per 30 t for each rod size	
15.11.3 Bond Strength - 15.24-mm Diameter Steel Prestressing Strand	ASTM A981	• 1 test for each reel of strand • 1 test per 1000 m of strand	
15.11.4 Bending, Hardness - Steel Rods, Strands	ACI 318, ASTM A370, E290, ISO 15630-3	• 1 test for each reel of wire or strand • 1 test per 1000 m of wire or strand • 1 test per 30 t for each rod size	
15.11.5 Chemical Analysis - Steel	ASTM A751, E350, ISO 15630-3	• 1 test for each reel of wire or strand • 1 test per 1000 m of wire or strand • 1 test per 30 t for each rod size	
15.11.6 Dimensions - Steel Strip Sheaths	EN524-1	• 1 test per 7000 m length	1 test shall comprise of 3 samples
15.11.7 Flexural Behaviour - Steel Strip Sheaths	EN524-2	• 1 test per 7000 m length	1 test shall comprise of 3 samples
15.11.8 To-and-Fro Bending - Steel Strip Sheaths	EN524-3	• 1 test per 7000 m length	1 test shall comprise of 3 samples
15.11.9 Lateral Load Resistance - Steel Strip Sheaths	EN524-4	• 1 test per 7000 m length	1 test shall comprise of 3 samples
15.11.10 Tensile Load Resistance - Steel Strip Sheaths	EN524-5	• 1 test per 7000 m length	1 test shall comprise of 3 samples
15.11.11 Leak Tightness - Steel Strip Sheaths	EN524-6	• 1 test per 7000 m length	1 test shall comprise of 3 samples

[46] Footnote 52: Materials and products conforming ASTM A416, A421, A722, ACI 318, BS 5896 or equivalent shall be tested as per this section requirement.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.11.12 Anchorages	As per relevant standards	• 1 test per 10 anchorages	
15.11.13 Couplers	As per relevant standards	• 1 test per 60 couplers	
15.11.14 Rib Geometry	ASTM A370, BS 4449, ISO 15630-1	• As per the Engineer's request	
15.11.15 Compression - Metallic Materials	ASTM E9	• As per the Engineer's request	
15.11.16 Hardenability, Hardness (Brinell, Rockwell, Indentation) - Bars, Metallic Materials	ASTM A255, E10, E18, E110, ISO 6506-1, ISO 6508-1	• As per the Engineer's request	
15.11.17 Torsion Test - Wires, Strand	ACI 318, A938	• As per the Engineer's request	
15.11.18 Welding Test - Reinforcement Bars	ACI 318, AWS D1.4	• As per the Engineer's request	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.12 WATER[47, 48]			Refer to footnote
15.12.1 Total Dissolved Solids (TDS)	APHA 2540	• 1 test per week - sewage treatment • 1 test per week - ground water	
15.12.2 Total Suspended Solids (TSS)	APHA 2540	• 1 test per week - sewage treatment • 1 test per week - ground water	
15.12.3 Total Volatile Suspended Solids (TVSS)	APHA 2540	• 1 test per week - sewage treatment	
15.12.4 Total Volatile Dissolved Solids (TVDS)	APHA 2540	• 1 test per week - sewage treatment	
15.12.5 Settleable Solids	APHA 2540	• 1 test per week - sewage treatment	
15.12.6 Total Solids	APHA 2540	• 1 test per week - sewage treatment	
15.12.7 Turbidity	APHA 2130	• 1 test per week - sewage treatment • 1 test per week - ground water	
15.12.8 Sludge Weight	APHA 2710	• 1 test per week - sewage treatment	
15.12.9 Sludge Volume	APHA 2710	• 1 test per week - sewage treatment	
15.12.10 Sludge Volume Index	APHA 2710	• 1 test per week - sewage treatment	
15.12.11 Oil & Grease	APHA 5520	• 1 test per week - sewage treatment	
15.12.12 Chloride	APHA 4500-Cl^-	• 1 test per week - sewage treatment • 1 test per week - ground water	
15.12.13 Residual Chlorine	APHA 4500-Cl	• 1 test per week - sewage treatment	
15.12.14 Total Chlorine	APHA 4500-Cl	• 1 test per week - sewage treatment	
15.12.15 Sulphate	APHA 4500-SO_4^{2-}	• 1 test per week - ground water	
15.12.16 Sulphide	APHA 4500-S^{2-}	• As per the Engineer's request	
15.12.17 Cyanides Concentration	APHA 4500-CN^-	• As per the Engineer's request	

[47] Footnote 53: This water testing is to be carried out for water that is recovered from the ground due to excavations (ground water), water that is received and discharged from the sewage treatment plant as applicable.

[48] Footnote 54: The specified tests are to be carried out for each sewage treatment plant at the specified frequency.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.12.18 Phosphorus (Total)	APHA 4500-P	• 1 test per week - sewage treatment	
15.12.19 pH	APHA 4500-H^+	• 1 test per week - sewage treatment	
15.12.20 Fluoride	APHA 4500-F^-	• As per the Engineer's request	
15.12.21 Bromide	APHA 4500-Br^-	• As per the Engineer's request	
15.12.22 Alkalinity (Total)	APHA 2320, ISO 9963-1 (BS 6068-2.51), ISO 9963-2 (BS 6068-2.52)	• 1 test per week - sewage treatment	
15.12.23 Phenolphthalein Alkalinity	APHA 2320, ISO 9963-1 (BS 6068-2.51), ISO 9963-2 (BS 6068-2.52)	• As per the Engineer's request	
15.12.24 Hardness (Total)	APHA 2340	• 1 test per week - sewage treatment • 1 test per week - ground water	
15.12.25 Conductivity	APHA 2510	• 1 test per week - sewage treatment • 1 test per week - ground water	
15.12.26 Calcium	APHA 3500-Ca	• 1 test per week - ground water	
15.12.27 Magnesium	APHA 3500-Mg	• 1 test per week - ground water	
15.12.28 Biochemical Oxygen Demand (BOD)	APHA 4500-O, APHA 5210	• 1 test per week - sewage treatment	
15.12.29 Chemical Oxygen Demand (COD)	APHA 5220	• 1 test per week - sewage treatment	
15.12.30 Total Organic Carbon (TOC)	APHA 5310	• As per the Engineer's request	
15.12.31 Ammonium Nitrogen	APHA 4500-NH_3	• 1 test per week - sewage treatment	
15.12.32 Nitrate Nitrogen	APHA 4500-NO_3^-	• As per the Engineer's request	
15.12.33 Nitrite Nitrogen	APHA 4500-NO_2	• As per the Engineer's request	
15.12.34 Total Nitrogen	APHA 4500-N	• As per the Engineer's request	
15.12.35 Total Organic Nitrogen, Kjeldahl Nitrogen	APHA 4500-N_{org}	• 1 test per week - sewage treatment	
15.12.36 Phenol Concentration	APHA 5530	• As per the Engineer's request	
15.12.37 Total Silicates	APHA 4500-SiO_2	• As per the Engineer's request	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.12.38 Organic Hydrocarbon (Total)	APHA 6200	• As per the Engineer's request	
15.12.39 Residual Pesticides	APHA 6630	• As per the Engineer's request	
15.12.40 Heavy Metals Concentrations	APHA 3110, APHA 3120	• As per the Engineer's request	
15.12.41 Mercury	APHA 3500-Hg	• As per the Engineer's request	
15.12.42 Arsenic	APHA 3500-As	• As per the Engineer's request	
15.12.43 Selenium	APHA 3500-Se	• As per the Engineer's request	
15.12.44 Boron	APHA 4500-Br	• As per the Engineer's request	
15.12.45 Aluminium	APHA 3111, APHA 3500-Al	• As per the Engineer's request	
15.12.46 Silicon	APHA 3111	• As per the Engineer's request	
15.12.47 Strontium	APHA 3500-Sr	• As per the Engineer's request	
15.12.48 Sodium	APHA 3500-Na	• As per the Engineer's request	
15.12.49 Potassium	APHA 3500-K	• As per the Engineer's request	
15.12.50 Hexavalent Chromium	APHA 3500-Cr	• As per the Engineer's request	
15.12.51 Total Chromium	APHA 3110	• As per the Engineer's request	
15.12.52 Total Coliform	APHA 9222	• 1 test per week - sewage treatment	
15.12.53 Fecal Coliform	APHA 9222	• 1 test per week - sewage treatment	
15.12.54 E Coli	APHA 9223	• 1 test per week - sewage treatment	
15.12.55 Giardia	APHA 9711	• As per the Engineer's request	
15.12.56 Viruses	APHA 9510	• As per the Engineer's request	
15.12.57 Nematodes (Helminth) Eggs	As per relevant standards	• 1 test per week - sewage treatment	
15.12.58 Microscopic Examination	As per relevant standards	• 1 test per week - sewage treatment	
15.12.59 Lead	APHA 3500-Pb Lead	• As per the Engineer's request	
15.12.60 Nickel	APHA 3500-Ni Nickel	• As per the Engineer's request	
15.12.61 Zinc	APHA 3500-Zn Zinc	• As per the Engineer's request	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.12.62 Cadmium	APHA 3500-Cd Cadmium	• As per the Engineer's request	
15.12.63 Copper	APHA 3500-Cu Copper	• As per the Engineer's request	
15.12.64 Gasoline Range Organics (C6-C10)	USEPA 5030C, 8015D	• As per the Engineer's request	
15.12.65 Diesel Range Organics (C11-C28)	USEPA 5030C, 8015D	• As per the Engineer's request	
15.12.66 Heavy Fraction Range (C29-C40)	USEPA 5030C, 8015D	• As per the Engineer's request	
15.12.67 Water Analysis of Soil or Soil Analysis for Water	Refer to Soil Investigation and Earthworks Section	• Refer to Soil Investigation and Earthworks Section	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.13 CEMENT[49, 50, 51]			Refer to footnote
15.13.1 Compressive Strength of Hydraulic Cement (Mortars)	AASHTO T106, ASTM C109, EN196-1	• Each source • Change in material • 1 test per 250 t of cement	
15.13.2 Chemical Analysis of Cement	AASHTO T105, ASTM C114, EN196-2	• Each source • Change in material • 1 test per 250 t of cement	
15.13.3 Setting Time	AASHTO T131, ASTM C191, C266, EN196-3	• Each source • Change in material • 1 test per 250 t of cement	
15.13.4 Consistency, Soundness	AASHTO T129, ASTM C187, EN196-3	• Each source • Change in material • 1 test per 250 t of cement	
15.13.5 Fineness of Cement	AASHTO T98, T153, ASTM C115, C204, C430, EN196-6	• Each source • Change in material • 1 test per 250 t of cement	
15.13.6 Consistence of Fresh Mortar - Masonry Cement	EN413-2	• Each source • Change in material • 1 test per 250 t of cement	
15.13.7 Air Content - Masonry Cement	EN413-2	• Each source • Change in material • 1 test per 250 t of cement	
15.13.8 Water Retention - Masonry Cement	EN413-2	• Each source • Change in material • 1 test per 250 t of cement	
15.13.9 Sieve Residue	EN196-6	• Each source • Change in material • 1 test per 250 t of cement	
15.13.10 Autoclave Expansion (Also known as Cement Shrinkage Test)	AASHTO T107, ASTM C151, EN12617-4	• Each source • Change in material • 1 test per 250 t of cement	

[49] Footnote 55: Ordinary Portland-Cement (AASHTO M85, ASTM C150, EN197-1), Sulphate Resisting Portland-Cement (BS 4027), Portland Blast Furnace Slag Cement, Masonry Cement (ASTM C91 or EN413-1) or equivalent shall be tested in accordance with this section as applicable.

[50] Footnote 56: The testing is to be carried out on site irrespective of whether the manufacturers' certificates are available or the testing has been done by the ready-mix concrete supplier.

[51] Footnote 57: Sampling shall be done in accordance with ASTM C183, EN196-7 or equivalent

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.13.11 Specific Gravity, Density	AASHTO T133, ASTM C188, EN196-6	• Each source • Change in material • 1 test per 250 t of cement	
15.13.12 Pozzolanicity Test for Pozzolanic Cement	EN196-5	• Each source • Change in material • 1 test per 250 t of cement	
15.13.13 Sulphate Resistant Cement	BS 4027	• Each source • Change in material • 1 test per 250 t of cement	
15.13.14 Early Stiffening	ASTM C451	• Each source • Change in material • 1 test per 250 t of cement	
15.13.15 Potential Expansion of Portland-Cement Mortars Exposed to Sulphate	ASTM C452	• Each source • Change in material • 1 test per 250 t of cement	
15.13.16 Heat of Hydration	BS 4550-3.8, EN196-2	• Each source • Change in material • 1 test per 250 t of cement	
15.13.17 Ground Granulated Blast-Furnace Slag - Chemical & Physical Properties52	ASTM C989, EN15167-1, EN15167-2	• Each source • Change in material • 1 test per 50 t • 1 test per month	Refer to footnote
15.13.18 Fly Ash or Pulverized-Fuel Ash - Chemical & Physical Properties52	ASTM C311, C618, EN450-1, EN450-2, EN451-1, EN451-2	• Each source • Change in material • 1 test per 50 t • 1 test per month	Refer to footnote
15.13.19 Silica Fume - Chemical & Physical Properties52	ASTM C1240, EN13263-1, EN13263-2	• Each source • Change in material • 1 test per 50 t • 1 test per month	Refer to footnote

[52] Footnote 58: Where applicable testing for these materials are to be carried out in addition to the normal tests which have already been specified in this section for cement.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.14 INTERLOCKING BLOCKS[53]			Refer to footnote
15.14.1 Flexural Strength, Tensile Strength, Splitting Strength – Natural Stones, Dimension Stones, Slate, Concrete Paving Blocks, Concrete Slab Units	ASTM C120, C140, C880, EN1338, EN12372	• Each type • 1 test per 12500 units • 1 test per 1000 m^2	
15.14.2 Water Absorption - Concrete Slab Units, Dimension Stone, Slate	ASTM C97, C121, C642, EN1338	• Each type • 1 test per 12500 units • 1 test per 1000 m^2	1 test shall comprise of 3 samples
15.14.3 Dimension, Flatness, Dimensional Stability - Concrete Slab Units, Agglomerated Stones, Concrete Paving Blocks	EN1338, EN12390-7, EN14617-12	• Each type • 1 test per 12500 units • 1 test per 1000 m^2	
15.14.4 Density (or Specific Gravity) - Concrete Slab Units, Dimension Stone	ASTM C97, C642, EN12390-7	• Each type • 1 test per 12500 units • 1 test per 1000 m^2	
15.14.5 Slip Resistance (Dry State) - Precast Paver Units, Natural Stones	ASTM E303, EN14231	• Each type • 1 test per 12500 units • 1 test per 1000 m^2	1 test shall comprise of 3 samples
15.14.6 Abrasion Resistance - Stone Subjected to Foot Traffic, Dimension Stone	ASTM C241, C1353	• Each type • 1 test per 12500 units • 1 test per 1000 m^2	
15.14.7 Compressive Strength - Dimension Stone	ASTM C170	• Each type • 1 test per 12500 units • 1 test per 1000 m^2	
15.14.8 Strength of Individual Stone Anchorages	ASTM C1354	• 1 test per 100 anchorages	
15.14.9 Cover Measurement - Concrete Slab Units	BS 1881-204	• As per the Engineer's request	
15.14.10 Initial Surface Absorption - Concrete Slab Units	BS 1881-208	• As per the Engineer's request	
15.14.11 Carbonation Depth - Concrete Slab Units	EN14630	• As per the Engineer's request	

[53] Footnote 59: Precast Concrete Paver Units (Perforated and Non-Perforated), Cement Unit Pavers, Ferrocement Roof Slabs, Ferrocement Sunbreaker Slabs, Natural Stone Products, Natural Stone Walkway Pavers, Slate, Dimension Stones and/or materials and products conforming to ASTM C936, EN1469, EN12057, EN12058, EN12059 or equivalent shall be tested as per this section requirements as applicable.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.14.12 Aggregates - Concrete Slab Units	Refer to Aggregates Section	• Refer to Aggregates Section	
15.14.13 Granular Base, Setting Bed for Concrete Pavers, Natural (Stone) Pavers	Refer to Earthworks, Subgrade Section	• Refer to Earthworks, Subgrade Section	
15.14.14 Compressive Strength - Setting Bed, Mortar (for Pavers)	Refer to Concrete or Masonry section as applicable	• Refer to Concrete or Masonry section as applicable	
15.14.15 Modulus of Rupture - Dimension Stone	ASTM C99	• As per the Engineer's request	
15.14.16 Flexural Modulus of Elasticity - Dimension Stone	ASTM C1352	• As per the Engineer's request	
15.14.17 Petrographic Examination - Dimension Stone	ASTM C1721	• As per the Engineer's request	
15.14.18 Weather Resistance - Slate	ASTM C217	• As per the Engineer's request	
15.14.19 Structural Performance - Exterior Cladding	ASTM C1201	• As per the Engineer's request	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.15 SURFACES FOR SPORTS AREAS, PLAYGROUND SURFACING ETC[54, 55]			Refer to footnote
15.15.1 Slip Resistance	EN14837	• 1 test per 500 m^2	
15.15.2 Joint Strength - Synthetic Surfaces	EN12228	• 1 test per 500 m^2	
15.15.3 Water Infiltration Rate	EN12616	• 1 test per 500 m^2	
15.15.4 Rotational Resistance	EN15301-1	• 1 test per 500 m^2	
15.15.5 Shock Absorption	EN14808	• 1 test per 500 m^2	
15.15.6 Spike Resistance	EN14810	• 1 test per 500 m^2	
15.15.7 Ball Roll Behaviour	EN12234	• 1 test per 500 m^2	
15.15.8 Artificial Weathering Test, Environmental Testing	EN14836	• 1 test per 500 m^2	
15.15.9 Fire Test	BS 7188	• 1 test per 500 m^2	

[54] Footnote 60: Products and materials conforming to BS 7044-1, EN14877, EN14904, EN15330-1, EN15330-2 or equivalent shall also be tested as per this section requirement.

[55] Footnote 61: Sampling shall be done in accordance with BS 7188 or equivalent as applicable.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.16 ADMIXTURES[56, 57]			Refer to footnote
15.16.1 Water Soluble Chloride Content	EN480-10	• Each Type • Each source • Change in material	
15.16.2 Setting Time	EN480-2	• Each Type • Each source • Change in material	
15.16.3 Alkali Content of Admixtures	EN480-12	• Each Type • Each source • Change in material	
15.16.4 Bleeding of Concrete	EN480-4	• Each Type • Each source • Change in material	
15.16.5 Capillary Absorption	EN480-5	• Each Type • Each source • Change in material	
15.16.6 Testing for Air-Entraining Admixtures	ASTM C233	• Each Type • Each source • Change in material	
15.16.7 Corrosion Susceptibility of Reinforcing Steel	EN480-14	• As per the Engineer's request	
15.16.8 Infrared Analysis	EN480-6	• As per the Engineer's request	
15.16.9 Air Voids Characteristics in Hardened Concrete	EN480-11	• As per the Engineer's request	
15.16.10 Conventional Dry Material Content	EN480-8	• As per the Engineer's request	
15.16.11 Suitability of Special Purpose Admixtures	BS 8443	• As per the Engineer's request	

[56] Footnote 62: Admixtures for concrete, mortar, grout, masonry etc as applicable. Admixtures conforming to ASTM C494, C1017, EN934-1, EN934-2, EN934-3, EN934-4, EN934-5 or equivalent as applicable.

[57] Footnote 63: Reference concrete, mortar, masonry for testing and sampling shall be done in accordance with EN480-1, EN480-13, EN934-6 or equivalent as applicable.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.17 CONCRETE, SHOTCRETE, CONCRETE PAVEMENT[58, 59]			Refer to footnote
15.17.1 Cement	Refer to Cement Section	• Refer to Cement Section	
15.17.2 Aggregates (Coarse, Fine, Lightweight etc) and Aggregate Reactivity	Refer to Aggregates Section	• Refer to Aggregates Section	
15.17.3 Admixtures	Refer to Admixtures Section	• Refer to Admixtures Section	
15.17.4 Water	AASHTO T26, ACI 318, ASTM C109, C191, EN1008	• Each source • Change in material • 1 test per 2000 m^3 of water • 1 test per month	
15.17.5 Sampling Plastic (Fresh) Concrete, Slump Testing, Temperature Measurement and Making Test Specimens in the Field	AASHTO T23, T119, T309, ASTM C31, C143, C172, C1064, C1611, EN12350-1, EN12350-2 (AASHTO R39, ASTM C192, BS 1881-125 may also be applicable)	• Slump & Temperature - 1 test per truck • Slump & Temperature - 1 test per 10 m^3 • Cube - 1 set per mix per day (6 cubes) • Cube - 1 set per 30 m^3 (6 cubes) • Temperature[60] (for mass concrete) - 1 test per 50 m^2 of concrete applied	Refer to footnote
15.17.6 Compressive Strength of Hardened Concrete (Making, Curing and Testing)	AASHTO T22, ASTM C39, EN12390-1, EN12390-2, EN12390-3	• 1 test for 7 days (3 cubes) • 1 test for 28 days (2 cubes)	Both (7 & 28 days) tests will have to be carried out
15.17.7 Density of Hardened Concrete	ASTM C642, EN12390-7	• All the cubes	
15.17.8 Vebe Test, Flow Table Test, Concrete Compacting Factor - Fresh Concrete	EN12350-3, 12350-4, 12350-5	• As per the Engineer's request	
15.17.9 Static Modulus of Elasticity in Compression	ASTM C469, BS 1881-121	• As per the Engineer's request	

[58] Footnote 64: Cast-in-Place, Ready-mix, Shotcrete, Self Consolidating and/or Concrete conforming to ASTM C94, BS 8500-1, BS 8500-2, EN206-1 or equivalent shall be tested as per this section requirement as applicable.

[59] Footnote 65: Sampling shall be done in accordance with ASTM C823 or equivalent where applicable.

[60] Footnote 66: 1 test shall refer to 3 monitoring points (ie, near the top surface, centre and near the bottom surface of the concrete pour) per 50 m^2 of concrete applied.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.17.10 Air Content of Fresh Concrete – Pressure Method	AASHTO T152, ASTM C231, EN12350-7	• As per the Engineer's request	
15.17.11 Air Content of Fresh Concrete – Volumetric Method	AASHTO T196, ASTM C173	• As per the Engineer's request	
15.17.12 Bleeding	ASTM C232	• As per the Engineer's request	
15.17.13 Density of Hardened, Unhardened Concrete - On Site, Nuclear Method	AASHTO T271, ASTM C1040, EN12390-7	• As per the Engineer's request	
15.17.14 Water Absorption of Hardened Concrete[61]	ASTM C642, BS 1881-122	• 1 test per 500 m^3	Refer to footnote
15.17.15 Water Penetration (or Permeability) of Hardened Concrete[61]	ASTM C803, EN12390-8, DIN 1048-5	• 1 test per 500 m^3	Refer to footnote
15.17.16 Rapid Chloride (Ion) Penetration (RCP) or Chloride Migration Test[61]	ASTM C1202, C1543, AASHTO T259, T277	• 1 test per 500 m^3	Refer to footnote
15.17.17 Sulphate Content of Hardened Concrete[61]	BS 1881-124	• 1 test per 500 m^3	Refer to footnote
15.17.18 Initial Surface (Water) Absorption[61]	BS 1881-208	• 1 test per 500 m^3	Refer to footnote
15.17.19 Chloride Ion Concentration, Chloride Content - Hardened Concrete[61]	ASTM C1152, C1218, BS 1881-124	• 1 test per 500 m^3 • 1 test per grade/class of concrete per week • Change in material	Refer to footnote
15.17.20 Rebound Hammer - Hardened Concrete	ASTM C805, BS 1881-201, EN12504-2	• 1 test per 500 m^2	
15.17.21 Ultrasonic Pulse Velocity Test - Hardened Concrete	ASTM C597, EN12504-4	• 1 test per 500 m^2	
15.17.22 Metal Cover Testing - Hardened Concrete	BS 1881-204	• 1 test per 500 m^2	
15.17.23 Cold Applied Joint Sealant Systems for Concrete Pavements	BS 5212-3	• Each Type • Each source • Change in material	

[61] Footnote 67: The required number of samples shall be tested per test as per the relevant specification.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.17.24 Hot-Applied Joint Sealant Systems for Concrete Pavements	BS 2499-3	• Each Type • Each source • Change in material	
15.17.25 Unit Weight Test (Density) of Fresh Concrete	AASHTO T121, ASTM C138, EN12350-6	• As per the Engineer's request	
15.17.26 Strain Measurement - Hardened Concrete	BS 1881-206	• As per the Engineer's request	
15.17.27 Depth of Carbonation - Cores or Broke (on Concrete)	EN14630	• As per the Engineer's request	
15.17.28 Core Compressive Strength	AASHTO T24, ASTM C42, EN12504-1	• As per the Engineer's request	
15.17.29 Cement Content of Hardened Concrete	ASTM C1084, BS 1881-124	• As per the Engineer's request	
15.17.30 Half-cell Potential - Hardened Concrete, Reinforcement Primer	ASTM C876	• As per the Engineer's request	
15.17.31 Particle Coating	AASHTO T195, ASTM D2489	• As per the Engineer's request	
15.17.32 Effect of Chemical Admixtures on the Corrosion of Embedded Steel - Chloride Environment	ASTM G109	• As per the Engineer's request	
15.17.33 Petrographic Examination on Hardened Concrete	ASTM C856	• As per the Engineer's request	
15.17.34 Tensile Splitting Strength of Test Specimens	EN12390-6	• As per the Engineer's request	
15.17.35 Flexural Strength of Hardened Concrete	EN12390-5	• As per the Engineer's request	
15.17.36 Tensile Strength of Concrete Surfaces	ASTM C1583	• As per the Engineer's request	
15.17.37 Pull-Out Strength - Hardened Concrete	ASTM C900	• As per the Engineer's request	
15.17.38 Length Change of Concrete Due to Alkali-Silica Reaction - Hardened Concrete	ASTM C1293	• As per the Engineer's request	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.17.39 Abrasion Resistance of Concrete Surfaces	ASTM C481, C779, C944, C1138	• As per the Engineer's request	
15.17.40 Time of Setting of Concrete Mixtures by Penetration Resistance	ASTM C403	• As per the Engineer's request	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.18 CONCRETE CURING[62]			Refer to footnote
15.18.1 Water Retention - Curing Compound	AASHTO T155, ASTM C156, C309, C1315, BS 7542	• Each Type • Each source • Change in material	
15.18.2 Reflectance, Pigments - Curing Compound	ASTM E1347	• Each Type • Each source • Change in material	
15.18.3 Drying Time - Curing Compound	AASHTO M148, ASTM C150, C309, BS 7542	• Each Type • Each source • Change in material	
15.18.4 Bond Strength Test - Curing Compound	ASTM C882	• As per the Engineer's request	
15.18.5 Density (or Relative Density)	ASTM D1475	• As per the Engineer's request	
15.18.6 Non-volatile Content and Settlement (or Volatile Organic Content - VOC)	ASTM D1644	• As per the Engineer's request	
15.18.7 Sheet Materials	AASHTO M171, ASTM C171	• Each Type • Change in material	
15.18.8 Burlap & Cotton	AASHTO M182	• Each Type • Change in material	
15.18.9 Supplementary Strength Tests to Verify Adequacy of Curing	As Directed by the Engineer	• As per the Engineer's request	

[62] Footnote 68: Products conforming to AASHTO M148, M182, ASTM C171, C309, C1315 or equivalent shall be tested in accordance with this section as applicable.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.19 PRECAST CONCRETE			
15.19.1 Cement	Refer to Cement Section	• Refer to Cement Section	
15.19.2 Bedding Mortar	Refer to Masonry, Mortar Section	• Refer to Masonry, Mortar Section	
15.19.3 Bedding Mortar In addition to the above, the mortar Sampling and Testing Programme to be proposed by the Contractor based on mortar type(s) and procedure(s); for Engineer's approval	Methods to be proposed by the Contractor based on mortar type(s) and procedure(s); for Engineer's approval	• Frequency to be proposed by the Contractor based on mortar type(s) and procedure(s); for Engineer's approval	Proposed program to include flow and strength testing
15.19.4 Welding Test - Reinforcement Bars	AWS D1.4	• As per the Engineer's request	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.20 WATERPROOFING, ROOFING[63, 64, 65]			Refer to footnote
15.20.1 Drainage Fabric (such as Geo-textiles, Geo-membranes, Geosynthetics etc)	Refer to Geo-textiles section	Refer to Geo-textiles section	
15.20.2 Average Thickness, Thickness Tolerance, Overall Thickness (as applicable) - Waterproofing Membrane	ASTM D412, D751, D1005, D5199, D3767, D7635, EN1849-1, EN1849-2, ISO 37	• 1 test per 10,000 m^2 • 1 test per 100 m^2 (for wet or dry film for liquid applied) • Change in material	Dry film testing shall be non-destructive
15.20.3 Density, Specific Gravity - Waterproofing Membrane, Waterstop	ASTM D297, D792	• 1 test per 10,000 m^2 • 1 test per 1000 m length for waterstop • Change in material	
15.20.4 Resistance to Chemicals, Liquids - Waterproofing Membrane	ASTM D297, D543, EN1847, ISO 2812-1, 2812-2, 2812-3, 2812-4, 2812-5	• 1 test per project site • Change in material	
15.20.5 Tensile Strength & Elongation (at Yield / Break) - Waterproofing Membrane, Waterstop	ASTM D412, D638, D882, D2370, D2523, D4073, EN12311-1, EN12311-2, ISO 527-1 (BS 2782-3, ISO 527-1), EN527-3, EN527-5	• 1 test per 10,000 m^2 • 1 test per 1000 m length for waterstop • Change in material	
15.20.6 Resistance Under Water Pressure, Water Penetration, Resistance, Tightness (as applicable) - Waterproofing Membrane	ASTM C1306, D5385, D7281, DIN 1048-5, EN1928, EN13111, EN15820, EN15817	• 1 test per project site • Change in material	
15.20.7 Water Absorption - Waterproofing Membrane	ASTM D471, D570, EN14223	• 1 test per project site • Change in material	

[63] Footnote 69: The testing is to be carried out for all waterproofing works such as tunnels, mined tunnels, building foundations, roofing, bridge-deck etc whether new construction or repair of existing structures.

[64] Footnote 70: The products such as Bonded Membrane, Unbonded Membrane, Butyl Rubber Sheeting, Thermoplastic Membrane (PVC), Composite (Self-Adhering) Membrane Sheeting, Flexible Cementitious and Non-Cementitious Membrane, Bituminous Type, Asphalt Primer (ASTM D41), Mastic Asphalt (EN12970), Polymer Modified Bituminous Coating (EN15814), Flexible Sheet (EN13967), Cold Liquid-Applied Elastomeric Waterproofing Membrane (ASTM C836) or equivalent shall be tested as per this section.

[65] Footnote 71: The sampling, preparation of samples shall be done in accordance with ASTM D146, D228, D2829, D3183, D3617, D5147, D7636, EN13416 or equivalent as applicable.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.20.8 Tear Resistance, Propagation Tear Resistance - Waterproofing Membrane	ASTM D624, D1004, D1922, D4932, EN12310-1, EN12310-2, ISO 34-2	• 1 test per 10,000 m^2 • Change in material	
15.20.9 Resistance to Puncture Propagation, Static, Dynamic Puncture - Waterproofing Membrane	ASTM D2582, D5602, D5635, E154, ISO 12236	• 1 test per 10,000 m^2 • Change in material	
15.20.10 Tensile Strength of Welded Seam, Seam Strength, Lap Adhesion (as applicable) - Waterproofing Membrane	ASTM D638, D1876, D6365, D6392, D7379	• 1 test per project site • Change in material	
15.20.11 Air Pressure Test - Welded Seam	As per relevant standards	• All the welded seams	
15.20.12 Resistance to Dynamic Water Pressure	EN14694	• As per the Engineer's request	
15.20.13 Resistance to Rain	EN15816	• As per the Engineer's request	
15.20.14 Dimensional Stability - Waterproofing Membrane	ASTM D1204, EN1107-1, EN1107-2, EN15818	• As per the Engineer's request	
15.20.15 Low Temperature Bend Test (or Flexibility) - Waterproofing Membrane	ASTM D746, D2136, D5636, EN1109, EN15813	• As per the Engineer's request	
15.20.16 Adhesion to Rigid Substrate, Self (or Peel Strength) - Waterproofing Membrane	ASTM D412, D1000, D429, D903, D4138, D4541, D7234, EN13596, ISO 4624	• 1 test per project site for preformed membrane • 3 test per 1000 m^2 (for liquid applied on site) • Change in material	
15.20.17 Water Vapour Permeability (or Water Vapour Transmission) - Waterproofing Membrane	ASTM D1653, E96, E154, EN1931	• 1 test per project site • Change in material	
15.20.18 Crack Bridging - Waterproofing Membrane	ASTM C1305	• 1 test per project site • Change in material	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.20.19 Pinhole Holiday Test	ASTM D4787	• The entire surface (100% testing)	
15.20.20 Water Ponding Test	ASTM D5957	• 100% of the horizontal surfaces	
15.20.21 Resistance to Ageing, Fatigue, Accelerated Weathering (UV Radiation, Heating), Extensibility, Retention of Properties - Waterproofing Membrane	ASTM C1522, D573, D822, D3045, D5849, E154, G154, EN1296, EN1297	• As per the Engineer's request	
15.20.22 Pliability Degrees - Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing	ASTM D146	• As per the Engineer's request	
15.20.23 Hardness (Initial-Shore, Rockwell, International) - Waterproofing Membrane	ASTM D785, D1415, D2240, ISO 48, ISO 7619-1, ISO 7619-2	• As per the Engineer's request	
15.20.24 Set to Touch, Drying Time - Waterproofing Membrane	ASTM D1640	• As per the Engineer's request	
15.20.25 Capability to Seal Around Fasteners - Waterproofing Membrane	ASTM D7349	• As per the Engineer's request	
15.20.26 Test Methods for Emulsified Bitumens Used as Protective Coatings	ASTM D2939	• As per the Engineer's request	
15.20.27 Dimension of Protection Board	BS 8102	• 1 test per 3000 m^2 • Change in material	
15.20.28 Softening Point - Waterproofing Membrane	ASTM D36	• 1 test per project site • Change in material	
15.20.29 Bitumen Content - Waterproofing Membrane	ASTM D4	• 1 test per 5000 m^2 • 1 test per 5000 litres • Change in material	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.20.30 Taber Abrasion (or Abrasion Resistance) - Acrylic Polymer, Liquid Membrane	ASTM D4060	• 1 test per project site if the application exceeds 4000 m^2	
15.20.31 Adhesives (Related to Waterproofing)	ASTM D412, D429	• As per the Engineer's request	
15.20.32 Viscosity - Roofing Bitumen	ASTM D4989	• As per the Engineer's request	
15.20.33 Working Time, Initial Setting Time and Service Strength Setting Time - Epoxy Mortar	ASTM C308	• 1 test per project site if the amount exceeds 2000 kg	
15.20.34 Compressive Strength - Epoxy Mortar	ASTM C579	• 1 test per project site if the amount exceeds 2000 kg	
15.20.35 Tensile Strength - Epoxy Mortar	ASTM C307	• 1 test per project site if the amount exceeds 2000 kg	
15.20.36 Flexural Strength - Epoxy Mortar	ASTM C580	• 1 test per project site if the amount exceeds 2000 kg	
15.20.37 Bond Strength - Epoxy Resin	ASTM C882	• 1 test per project site if the amount exceeds 2000 kg	
15.20.38 Density - Epoxy Resin	ASTM D1475	• 1 test per project site if the amount exceeds 2000 kg	
15.20.39 Coefficient of Linear Expansion - Epoxy Mortar	ASTM C531	• As per the Engineer's request	
15.20.40 Water Absorption - Epoxy Mortar	ASTM C413	• As per the Engineer's request	
15.20.41 Vapour Transmission - Volatile Liquid	ASTM D814	• As per the Engineer's request	
15.20.42 Voids - Roofing and Waterproofing Membrane	ASTM D5076	• As per the Engineer's request	
15.20.43 Flexibility - Roofing and Waterproofing Materials and Membranes	ASTM D5683	• As per the Engineer's request	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.20.44 Non-volatile Content - Cold Liquid Applied Membrane	ASTM C1250	• As per the Engineer's request	
15.20.45 Characterizing Thermoplastic Fabrics - Roofing and Waterproofing	ASTM D4830	• As per the Engineer's request	
15.20.46 Resistance to Wind Load, Uplift- Membrane Roofing Systems	ASTM E907, EN16002	• As per the Engineer's request	
15.20.47 Impact Resistance - Bituminous Roofing Systems	ASTM D3746	• As per the Engineer's request	
15.20.48 Adhesive and Cohesive Strength Between Materials - Roofing or Waterproofing Membranes and Systems	ASTM D7105	• As per the Engineer's request	
15.20.49 Resistance to Compaction of Asphalt Layer - Waterproofing Membrane for Bridge	EN14692	• 1 test per project site	
15.20.50 Behaviour of Bitumen Sheets During Application of Mastic Asphalt - Waterproofing Membrane for Bridge	EN14693	• 1 test per project site	
15.20.51 Compatibility by Heat Conditioning - Waterproofing Membrane for Bridge	EN14691	• 1 test per project site	
15.20.52 Peel, Shear Resistance of Joints - Waterproofing Membrane	EN12316-1, EN12316-2, EN12317-1, EN12317-2	• 1 test per project site for bonded system	
15.20.53 Resistance to Ozone - Waterproofing Membrane	EN1844	• As per the Engineer's request	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.20.54 Testing and Analysis of Asphalt Roll Roofing, Cap Sheets, and Shingles Used in Roofing and Waterproofing	ASTM D228	• As per the Engineer's request	
15.20.55 Corrosion Resistance of Ferrous Metal Fastener Assemblies Used in Roofing and Waterproofing	ASTM D6294	• As per the Engineer's request	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.21 RESIN, POLYMER/CEMENT COMPOSITION[66, 67]			Refer to footnote
15.21.1 Compressive Strength	BS 6319-2	• 1 test per 2000 kg if the amount exceeds 2000 kg in total	
15.21.2 Modulus of Elasticity in Flexure, Flexural Strength	BS 6319-3	• 1 test per 2000 kg if the amount exceeds 2000 kg in total	
15.21.3 Density of Hardened Resin Compositions	BS 6319-5	• 1 test per 2000 kg if the amount exceeds 2000 kg in total	
15.21.4 Modulus of Elasticity in Compression	BS 6319-6	• 1 test per 2000 kg if the amount exceeds 2000 kg in total	
15.21.5 Tensile Strength	ASTM C307, BS 6319-7	• 1 test per 2000 kg if the amount exceeds 2000 kg in total	
15.21.6 Resistance to Liquids	BS 6319-8	• 1 test per 2000 kg if the amount exceeds 2000 kg in total	
15.21.7 Peak Exotherm Temperature	BS 6319-9	• 1 test per 2000 kg if the amount exceeds 2000 kg in total	
15.21.8 Temperature of Deflection Under Bending Stress	BS 6319-10	• 1 test per 2000 kg if the amount exceeds 2000 kg in total	
15.21.9 Creep in Compression	BS 6319-11	• 1 test per 2000 kg if the amount exceeds 2000 kg in total	
15.21.10 Unrestrained Linear Shrinkage, Coefficient of Thermal Expansion	BS 6319-12	• 1 test per 2000 kg if the amount exceeds 2000 kg in total	
15.21.11 UV Accelerated Weathering	ASTM G154	• 1 test per 2000 kg if the amount exceeds 2000 kg in total	
15.21.12 Slant Shear Strength	ASTM C882, EN12615	• 1 test per 500 litres if the amount exceeds 500 litres in total	
15.21.13 Shear Adhesion Bond	ASTM C482	• 1 test per 500 litres if the amount exceeds 500 litres in total	
15.21.14 Skid Resistance	ASTM E303	• As per the Engineer's request	
15.21.15 Taber Abrasion	ASTM D4060	• As per the Engineer's request	

[66] Footnote 72: Acrylic Polymer (for all applications), Elastomeric Joint Sealant (ASTM C920), Acrylic Polymer (ASTM C881), Latex Agents for Bonding (ASTM C1059) or equivalent shall be tested as per this section requirement.

[67] Footnote 73: Sampling shall be done in accordance with BS 6319-1 or equivalent as applicable.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.22 MASONRY, BRICK, MORTAR ETC AND RELATED ACCESSORIES[68, 69, 70]			Refer to footnote
15.22.1 Compressive Strength - Masonry Units	EN772-1	• Each type • 1 test per batch/lot • 1 test per 5000 units • 1 test per 1000 m^2	1 test shall comprise of 5 samples
15.22.2 Density - Masonry Units	EN772-4, EN772-13	• Each type • 1 test per batch/lot • 1 test per 5000 units • 1 test per 1000 m^2	
15.22.3 Dimension - Masonry Units	EN772-16	• Each type • 1 test per batch/lot • 1 test per 5000 units • 1 test per 1000 m^2	
15.22.4 Flatness - Masonry Units	EN772-20	• Each type • 1 test per batch/lot • 1 test per 5000 units • 1 test per 1000 m^2	
15.22.5 Water Absorption - Masonry Units	EN772-11, EN772-21	• Each type • 1 test per batch/lot • 1 test per 5000 units • 1 test per 1000 m^2	1 test shall comprise of 3 samples
15.22.6 Bending Tensile Strength - Masonry Units	EN772-6	• Each type • 1 test per batch/lot • 1 test per 5000 units • 1 test per 1000 m^2	
15.22.7 Precast Concrete Masonry Units	BS 6073-2	• Each type • 1 test per batch/lot • 1 test per 5000 units • 1 test per 1000 m^2	
15.22.8 Filler for Movement Joint - Boards	ASTM D1751	Each type Change in material	
15.22.9 Movement Joint Sealant	ASTM C793, ISO 11600	• Each type • Change in material	

[68] Footnote 74: Masonry, Masonry Units, Precast Concrete Masonry Units, Movement Joint Materials, Mortar, Screed, Plaster, Skim Coat, Grout for Masonry, Bonding Agent, Lime, Gypsum, Polymer Modified Cement Mortar, Prepacked Floor Screed, Prepacked Waterproof Screed, Self-Levelling Screed, Prepacked Plaster, Prepacked Skim Coat, Grouts for Masonry (ASTM C476), Mortar for Masonry (ASTM C144, C270) and/or products or materials conforming to BS 6073-2, EN771-1, EN771-2, EN771-3, EN771-4, EN771-5, EN771-6, EN1338 or equivalent shall be tested as per this section requirement.

[69] Footnote 75: Each material shall be tested separately as per the specified testing frequency as applicable.

[70] Footnote 76: Sampling shall be done in accordance with ASTM C50, C67, C1019, EN13892-1 or equivalent as applicable.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.22.10 Water Penetration and Leakage Through Masonry	ASTM E514	• As per the Engineer's request	
15.22.11 Flexural Bond Strength of Masonry	ASTM C1072, C1357, E518	• As per the Engineer's request	
15.22.12 Compressive Strength (Average) - Mortar, Screed etc	ASTM C109, C349, BS 4551, EN1015-11, EN12190, EN13892-2	• Each mix • Change in mix	
15.22.13 Flow (Consistency), Flowability	ASTM C939, C1437, EN1015-4	• Each mix • Change in mix	
15.22.14 Water Absorption - Mortar, Screed etc	ASTM C413	• Each mix • Change in mix	
15.22.15 Water Penetration Test	DIN 1048-5	• Each mix • Change in mix	
15.22.16 Flexural Strength - Mortar, Screed etc	ASTM C348	• Each mix • Change in mix	
15.22.17 Volume Change and/or (Linear) Shrinkage	ASTM C157, C531, C827	• As per the Engineer's request	
15.22.18 Water Retention and/or Consistency Retention - Mortar, Screed etc	ASTM C1506, BS 4551	• Each mix • Change in mix	
15.22.19 Stiffening Time - Mortar	EN1015-9	• Each mix • Change in mix	
15.22.20 Setting Time - Skim Coat	EN196-3	• Each mix • Change in mix	
15.22.21 UV Accelerated Weathering - Self Levelling Screed	ASTM G154	• Each mix • Change in mix	
15.22.22 Shear Adhesion Bond - Self-Levelling Screed	ASTM C482	• Each mix • Change in mix	
15.22.23 Slip Resistance (Before and After Accelerated Weathering) - Self Levelling Screed	EN13036-4	• Each mix • Change in mix	
15.22.24 Tensile Adhesion Bond Strength - Self Levelling Screed	ASTM D4541, EN13892-8	• As per the Engineer's request	
15.22.25 Bond Strength of Mortar to Masonry Units	ASTM C952	• As per the Engineer's request	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.22.26 Tensile Pull Off Strength (Before and After Weathering)	EN1015-12	• As per the Engineer's request	
15.22.27 Preconstruction & Construction Evaluation - Mortars for Plain and Reinforced Unit Masonry	ASTM C780	• As per the Engineer's request	
15.22.28 Abrasion Resistance of Mortar Surfaces	ASTM C944	• As per the Engineer's request	
15.22.29 Air Content - Hydraulic Cement Mortar	ASTM C185	• As per the Engineer's request	
15.22.30 Length Change of Hydraulic-Cement Mortars Exposed to a Sulfate Solution	ASTM C1012	• As per the Engineer's request	
15.22.31 Examination and Analysis - Hardened Mortar	ASTM C1324	• As per the Engineer's request	
15.22.32 Total Solids Content - Bonding Agent	ISO 124	• As per the Engineer's request	
15.22.33 Physical Testing - Lime	ASTM C110	• As per the Engineer's request	
15.22.34 Physical Testing - Gypsum	ASTM C472	• As per the Engineer's request	
15.22.35 Block Type Insulation	ASTM C203	• As per the Engineer's request	
15.22.36 Calcium Sulphate - Bedding Mortar for Precast, Pavers, Stones	ASTM C265	• Each Source • Change in material	
15.22.37 Water Soluble Chloride - Mortar, Bedding Mortar	ASTM C1218	• Each Source • Change in material	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.23 CONCRETE KERB (OR CURB) & KERBSTONE (CURBSTONE)			
15.23.1 Dimension	EN1339, EN1340	• Each Type • 1 test per 1000 units	
15.23.2 Water Absorption	EN1339, EN1340	• Each Type • 1 test per 1000 units	
15.23.3 Bending Strength	EN1339, EN1340	• Each Type • 1 test per 1000 units	
15.23.4 Compressive Strength	EN1339, EN1340	• Each Type • 1 test per 1000 units	
15.23.5 Transverse Strength	EN1339, EN1340	• Each Type • 1 test per 1000 units	
15.23.6 Flatness	EN1339, EN1340	• Each Type • 1 test per 1000 units	
15.23.7 Core Samples	EN1339, EN1340	• As per the Engineer's request	

Material /Section / Activity[1, 2] & the Required Tests		Method[3]	Minimum Frequency[4, 5]	Remarks
15.24	**GEO-TEXTILE, GEO-MEMBRANE, GEOSYNTHETICS[71, 72]**			Refer to footnote
15.24.1	**Grab Strength, Grab Break Load**	ASTM D4632, D5034	• 1 test per 2,000 m^2 • Change in material	
15.24.2	**Puncture Strength (CBR Puncture Test), Static Puncture Test**	ASTM D751, D3787, D4833, D6241, ISO 12236	• 1 test per 2,000 m^2 • Change in material	
15.24.3	**Burst Strength, Trapezoidal Strength, Tear Resistance**	ASTM D1004, D4533	• 1 test per 2,000 m^2 • Change in material	
15.24.4	**Strength, Tensile Strength**	ASTM D4595, D4885, D5035, D6693, ISO 10319	• 1 test per 2,000 m^2 • Change in material	
15.24.5	**Elongation & Rapture, Mean Peak Strength**	ASTM D4595, D4632, ISO 10319	• 1 test per 2,000 m^2 • Change in material	
15.24.6	**Permeability (Water), Water Absorption**	ASTM D570, D4491, EN11058, SN 640550	• 1 test per 2,000 m^2 • Change in material	
15.24.7	**Dimension, Density, Mass, Mass Per Unit Area**	ASTM D1505, D5261, D5993 ISO 9864	• 1 test per 2,000 m^2 • Change in material	
15.24.8	**Opening Size (Pore Size)**	ASTM D4595, ISO 12956, DIN 60500	• 1 test per 2,000 m^2 • Change in material	
15.24.9	**Thickness**	ASTM D751, D5199, D5994, ISO 9863-1, ISO 9863-2	• 1 test per 2,000 m^2 • Change in material	
15.24.10	**Ultrasonic Testing - Geomembrane**	ASTM D7006	• 1 test per 2,000 m2 • Change in material	
15.24.11	**Peel Test, Tensile Test, Seam Evaluation, Air Channel Evaluation - Joints, Seams**	ASTM D413, D4437, D5641, D6365, D6392, ISO 10321	• Non-destructive testing to be done for each welded joint or seam • Destructive testing is to done as per the Engineer's request	
15.24.12	**Shear Test - Seams**	ASTM D816, D4437, D6392	• As per the Engineer's request	
15.24.13	**Resistance to Perforation**	ISO 13433	• As per the Engineer's request	
15.24.14	**Pull-out Resistance in Soil**	EN13738	• As per the Engineer's request	

[71] Footnote 77: These tests shall be carried out for geo-textiles, geo-textile related products, geo-membranes, geo-membrane related products, geosynthetics, geosynthetics clay liners etc wherever its use may be such as in the tunnels, sea-sides, soil stabilisation, embankment, roofs etc as applicable.

[72] Footnote 78: Sampling shall be done in accordance with ASTM D4354 or equivalent as applicable.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.24.15 Carbon Black Content, Carbon Black Dispersion - Geomembrane, Geosynthetics	ASTM D4218, D5596	• As per the Engineer's request	
15.24.16 Peel Strength - Needle Punched Geosynthetic	ASTM D6496	• As per the Engineer's request	
15.24.17 Moisture Content - Geosynthetic Clay Liners	ASTM D2216	• 1 test per 2,000 m2 • Change in material	
15.24.18 Bentonite Free Swell, Swell Index - Geosynthetic Clay Liners	ASTM D5890	• 1 test per 2,000 m2 • Change in material	
15.24.19 Montmorillonite Content - Geosynthetic Clay Liners	ISO 10416	• As per the Engineer's request	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.25 ANTI-TERMITE TREATMENT			
15.25.1 Sampling and Testing Programme to be proposed by the Contractor for Engineer's approval	Methods to be proposed by the Contractor for Engineer's approval	• Frequency to be proposed by the Contractor for Engineer's approval	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.26 FIRE TESTING			
15.26.1 Reaction to Fire Tests - Building Products	EN13823	• 1 test per project site • 1 test per type • Change in material	
15.26.2 Fire Rating Test - All Applicable Material	BS 476	• 1 test per project site • 1 test per type • Change in material	
15.26.3 Where not stated clearly, Sampling and Testing Programme to be proposed by the Contractor for Engineer's approval	Methods to be proposed by the Contractor for Engineer's approval	• Frequency to be proposed by the Contractor for Engineer's approval	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.27 ALUMINIUM, ALUMINIUM ALLOYS – DOORS, WINDOWS, SHEETS, STRIPS, PLATES ETC[73]			
15.27.1 Chemical Analysis	EN573-3	• 1 test per project site • 1 test per type • Change in material	
15.27.2 Dimensions	EN485-1, EN755-3, EN755-6, EN755-4, EN755-7, EN755-8, EN755-9, EN12020-2	• 1 test per 1000 m • 1 test per type • Change in material	
15.27.3 Mechanical Properties	EN485-2, EN755-2	• 1 test per 1000 m • 1 test per type • Change in material	
15.27.4 Tension Test - Wrought and Cast Aluminum-Alloy and Magnesium-Alloy Products	ASTM B557	• As per the Engineer's request	

[73] Footnote 79: Products conforming to BS 3987, BS 4873, BS 6496 or equivalent as applicable.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.28 STEEL DOORS AND WINDOWS			
15.28.1 Sampling and Testing Programme to be proposed by the Contractor for Engineer's approval	Methods to be proposed by the Contractor for Engineer's approval	• Frequency to be proposed by the Contractor for Engineer's approval	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.29 HANDRAILS AND BALUSTER[74]			Refer to footnote
15.29.1 Sampling and Testing Programme to be proposed by the Contractor for Engineer's approval	Methods to be proposed by the Contractor for Engineer's approval	• Frequency to be proposed by the Contractor for Engineer's approval	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.30 TIMBER DOOR, WINDOWS, CARPENTRY, JOINERY AND IRONMONGERY[75]			Refer to footnote
15.30.1 Sampling and Testing Programme to be proposed by the Contractor for Engineer's approval	Methods to be proposed by the Contractor for Engineer's approval	• Frequency to be proposed by the Contractor for Engineer's approval	

[74] Footnote 80: Products conforming to ASTM A36, A47, A53, A500 or equivalent as applicable.

[75] Footnote 81: Products conforming to BS 4965 or equivalent as applicable.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.31 TILES, GROUTS AND ADHESIVE FOR TILES ETC[76, 77]			Refer to footnote
15.31.1 Resistance to Surface Abrasion - Tiles	ISO 10545-7	• 1 test per 3000 units • 1 test per type • Change in material	
15.31.2 Resistance to Deep Abrasion - Tiles	ISO 10545-6	• 1 test per 3000 units • 1 test per type • Change in material	
15.31.3 Impact Resistance - Tiles	ISO 10545-5	• 1 test per 3000 units • 1 test per type • Change in material	
15.31.4 Dimensions, Surface Flatness & Surface Quality - Tiles	ASTM C485, ISO 10545-2	• 1 test per 3000 units • 1 test per type • Change in material	
15.31.5 Water Absorption, Relative Density - Tiles	ASTM C373, ISO 10545-3	• 1 test per 3000 units • 1 test per type • Change in material	
15.31.6 Modulus of Rapture and Breaking Strength - Tiles	ISO 10545-4	• 1 test per 3000 units • 1 test per type • Change in material	
15.31.7 Moisture Expansion - Tiles	ISO 10545-10	• As per the Engineer's request	
15.31.8 Chemical Resistance - Tiles	ISO 10545-13	• As per the Engineer's request	
15.31.9 Resistance to Stains - Tiles	ISO 10545-14	• As per the Engineer's request	
15.31.10 Linear Thermal Expansion - Tiles	ISO 10545-8	• 1 test per 3000 units • 1 test per type • Change in material	
15.31.11 Crazing Resistance - Tiles	ISO 10545-11	• As per the Engineer's request	
15.31.12 Chemical Resistance - Grout for Tiles	EN12808-1	• 1 test per type/mix • Change in material	
15.31.13 Resistance to Abrasion (or Wear Test) - Grout for Tiles	EN12808-2, ISO 13007-4	• 1 test per type/mix • Change in material	
15.31.14 Bend (or Flexural) and Compressive Strength - Grout for Tiles	EN12808-3, ISO 13007-4	• As per the Engineer's request	
15.31.15 Shrinkage - Grout for Tiles	EN12808-4, ISO 13007-4	• 1 test per type/mix • Change in material	

[76] Footnote 82: Products and materials conforming to BS 5385-1, BS 5385-2, BS 5385-3, BS 5385-4, BS 5385-5, EN12004, EN13748-1, EN13748-2, EN13888, EN14411, EN14891, ISO 10545, ISO 13007-1, ISO 13007-3 or equivalent shall also be tested as per this section requirement as applicable.

[77] Footnote 83: Sampling and testing is to be done in accordance with EN13748-1, EN13748-2, ISO 10545-1 or equivalent as applicable.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.31.16 Water Absorption - Grout for Tiles	EN12808-5, ISO 13007-4	• 1 test per type/mix • Change in material	
15.31.17 Slip, Adhesion Test - Adhesives for Tiles	ISO 13007-2	• 1 test per type/mix • Change in material	
15.31.18 Tensile & Shear Adhesion, Bond Strength – Adhesives, Reaction Resin Adhesives for Tiles	ASTM C482, EN1324, EN1348, EN12003	• 1 test per type/mix • Change in material	
15.31.19 Open Time - Adhesives for Tiles	EN1346	• 1 test per type/mix • Change in material	
15.31.20 Shear Testing - Adhesives for Tiles	ISO 13007-2	• As per the Engineer's request	
15.31.21 Compressive Testing - Adhesives for Tiles	ISO 13007-2	• As per the Engineer's request	
15.31.22 Deformation - Adhesives for Tiles	ISO 13007-2	• As per the Engineer's request	
15.31.23 Chemical Resistance - Adhesives for Tiles	ISO 13007-2	• As per the Engineer's request	
15.31.24 Tensile Testing - Adhesives for Tiles	ISO 13007-2	• As per the Engineer's request	
15.31.25 Wetting Capability - Adhesives for Tiles	EN1347	• 1 test per type/mix • Change in material	
15.31.26 Terrazzo Tiles - Internal and External Use	EN13748-1, EN13748-2	• 1 test per 3000 units • 1 test per type • Change in material	
15.31.27 Transverse Deformation - Cementitious Adhesives and Grouts	EN12002	• As per the Engineer's request	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.32 SUSPENDED CEILING			
15.32.1 Dimensions	EN13964	• 1 test per type • Change in material	
15.32.2 Fire Tests	EN13964	• 1 test per type • Change in material	
15.32.3 Tensile Strength	EN13964	• 1 test per type • Change in material	
15.32.4 Bend Testing	EN13964	• 1 test per type • Change in material	
15.32.5 Load Capacity	EN13964	• 1 test per type • Change in material	
15.32.6 Electrical Testing	EN13964	• As per the Engineer's request	
15.32.7 Noise Control (Acoustic)	EN13964	• 1 test per type • Change in material	
15.32.8 Thermal Conductivity	EN13964	• 1 test per type • Change in material	
15.32.9 Moisture Control	EN13964	• 1 test per type • Change in material	
15.32.10 Condensation	EN13964	• 1 test per type • Change in material	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.33 GLASS FIBRE REINFORCED CONCRETE			
15.33.1 Sampling and Testing Program to be proposed by the Contractor to be approved by the Engineer	Methods to be proposed by the Contractor and to be approved by the Engineer	• Frequency to be proposed by the Contractor and to be approved by the Engineer	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.34 GLASS AND GLAZING			
15.34.1 Sampling and Testing Program to be proposed by the Contractor to be approved by the Engineer	Methods to be proposed by the Contractor and to be approved by the Engineer	• Frequency to be proposed by the Contractor and to be approved by the Engineer	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.35 PAINT, VARNISH, PIGMENTS FOR COLOURING			
15.35.1 Density of Paint	ASTM D1475	• 1 test per type • Change in material	
15.35.2 Thickness (Wet & Dry)	ASTM D1005, D1212	• 1 test per 1000 m^2 • 1 test per type • Change in material	Non destructive
15.35.3 Scrub Resistance	ASTM D2486	• 1 test per type • Change in material	
15.35.4 Viscosity	ASTM D562	• 1 test per type • Change in material	
15.35.5 Sag Resistance (or Sagging Mills)	ASTM D4400	• 1 test per type • Change in material	
15.35.6 Specular Gloss of Non-Metallic Paint Films	ISO 2813	• 1 test per type • Change in material	
15.35.7 Fineness of Dispersion of Pigment-Vehicle Systems	ASTM D1210	• 1 test per type • Change in material	
15.35.8 Colour Measurement of Paint and Varnishes[78] (Also known as Comparison for Paint)	BS 3900-D9 (ISO 7724-2)	• 1 test per type • Change in material	Refer to footnote
15.35.9 Comparison of Contrast Ratio[78]	ISO 2814 (BS 3900-D4)	• 1 test per type • Change in material	Refer to footnote
15.35.10 pH	ISO 787-9	• 1 test per type • Change in material	
15.35.11 Cross-cut Tests of Paints and Varnishes[79]	ASTM D3359, ISO 2409 (BS 3900-E6)	• 1 test per type • Change in material	Refer to footnote
15.35.12 Adhesion (Pull Off) Strength[79]	ASTM D4541, ISO 4624	• 1 test per type • Change in material	Refer to footnote
15.35.13 Pigment Content	ASTM D3723	• 1 test per type • Change in material	
15.35.14 Resistance to Liquids	ASTM D5401, ISO 2812-1, 2812-2, 2812-3, 2812-4, 2812-5	• 1 test per type • Change in material	
15.35.15 Pigments for the Colouring of Building Materials	EN12878	• 1 test per type • Change in material	
15.35.16 Fire Resistance	Refer to fire testing section	• Refer to fire testing section	

[78] Footnote 84: It is sufficient for the Contractor to carry out either one of these Tests, whichever is deemed suitable for the site in consultation with the Engineer.

[79] Footnote 85: It is sufficient for the Contractor to carry out either one of these Tests, whichever is deemed suitable for the site in consultation with the Engineer.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.35.17 Volatile Content	ASTM D2369, EN11890-1, EN11890-2	• As per the Engineer's request	
15.35.18 Non-Volatile Content	ASTM D5095	• As per the Engineer's request	
15.35.19 Bend Test, Flexibility of Paints and Varnishes	ASTM D522, ISO 1519	• As per the Engineer's request	
15.35.20 Resistance to Abrasion	ASTM D4060	• As per the Engineer's request	
15.35.21 Tensile Property	ASTM D2370	• As per the Engineer's request	
15.35.22 Resistance to Weathering, Accelerated Weathering	ASTM D822, D4587	• As per the Engineer's request	
15.35.23 Drying Time	ASTM D1640, D5896	• As per the Engineer's request	
15.35.24 Rheological Properties	ASTM D2196	• As per the Engineer's request	
15.35.25 Hiding Power	ISO 11475	• As per the Engineer's request	
15.35.26 Average Reflectance	As per relevant standards	• As per the Engineer's request	
15.35.27 Alkali Resistance	ASTM D1647	• As per the Engineer's request	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.36 ROAD MARKING MATERIALS[80, 81]			Refer to footnote
15.36.1 Yellowness Index - Thermoplastic	AASHTO M249	• 1 test per 1000 kg • Change in material	
15.36.2 Thickness - Thermoplastic	BS 3262-3	• 1 test per 500 m	
15.36.3 Skid Resistance - Thermoplastic	EN1436	• 1 test per 500 m	
15.36.4 Density - Thermoplastic	AASHTO T250, BS 3262-3	• 1 test per 1000 kg • Change in material	
15.36.5 Luminance - Thermoplastic	AASHTO M249	• 1 test per 1000 kg • Change in material	
15.36.6 Drying Time - Thermoplastic	AASHTO T250	• 1 test per 1000 kg • Change in material	
15.36.7 Softening Point - Thermoplastic	AASHTO T250, ASTM D36	• 1 test per 1000 kg • Change in material	
15.36.8 Flowability - Thermoplastic	AASHTO T250	• 1 test per 1000 kg • Change in material	
15.36.9 Abrasion Resistance - Thermoplastic	ASTM D968, 4060	• 1 test per 1000 kg • Change in material	
15.36.10 Glass Bead Content	AASHTO T250, EN1423, EN1424	• 1 test per 1000 kg • Change in material	
15.36.11 Drying Time Test - Paints	ASTM D711	• 1 test per 500 m	
15.36.12 Settling Properties - Traffic Paints	ASTM D869, D1309	• As per the Engineer's request	
15.36.13 Calcium Carbonate Content	ASTM D1199	• As per the Engineer's request	
15.36.14 Bond Strength	ASTM D4796	• 1 test per 1000 kg • Change in material	
15.36.15 Binder Content	ASTM D3723	• 1 test per 1000 kg • Change in material	
15.36.16 Sieve Analysis (Gradation) - Road Marking Materials	ASTM D1214, D7681, EN1423, EN1424	• 1 test per 1000 kg • Change in material	
15.36.17 Performance - Retroreflecting Road Studs	EN1463-1, EN1463-2	• 1 test per 500 m	

[80] Footnote 86: Road marking, Marking, Roads, Studs (road), Cats eyes, Construction systems parts, Retroreflective materials, Reflective materials, Permanent, Temporary etc as applicable.

[81] Footnote 87: Sampling shall be done in accordance with ASTM D7307, D7308 or equivalent as applicable.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.36.18 Dimensions - Retroreflecting Road Studs	EN1463-1, EN1463-2	• 1 test per project site	
15.36.19 Visibility (Night-time) - Retroreflecting Road Studs	EN1463-1, EN1463-2	• 1 test per 500 m • 1 test per 100 pcs	
15.36.20 Visibility (Daytime) - Retroreflecting Road Studs	EN1463-1, EN1463-2	• 1 test per 500 m • 1 test per 100 pcs	
15.36.21 Luminous Intensity - Retroreflecting Road Studs	EN1463-1, EN1463-2	• 1 test per project site	
15.36.22 Colour, Colorimetry - Retroreflecting Road Studs	EN1463-1, EN1463-2	• 1 test per project site	
15.36.23 Chromaticity - Retroreflecting Road Studs	EN1463-1, EN1463-2	• 1 test per project site	
15.36.24 Resilience - Retroreflecting Road Studs	EN1463-1, EN1463-2	• 1 test per project site	
15.36.25 Fixing - Retroreflecting Road Studs	EN1463-1, EN1463-2	• 1 test per 500 m • 1 test per 100 pcs	
15.36.26 Optical Measurement - Retroreflecting Road Studs	EN1463-1, EN1463-2	• 1 test per project site	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.37 UPVC, PLASTIC - PIPES, FITTINGS, VALVES ETC[82]			Refer to footnote
15.37.1 Dimensions	As per relevant standards	• Each type • Each batch of delivery • Each diameter	
15.37.2 Pressure Testing	As per relevant standards	• Each type • Each batch of delivery • Each diameter	
15.37.3 Thermoplastic Ancillary Fittings	BS 4660, EN13598-1	• Each type • Each batch of delivery • Each diameter	
15.37.4 Hydrostatic Test	As per relevant standards	• As per Engineer's request	
15.37.5 Tensile Test	ASTM D638, ISO 527-1 (BS 2782-3, ISO 527-1), ISO 527-2 (BS 2782-3)	• Each type • Each batch of delivery • Each diameter	
15.37.6 Leaktightness	ISO 13845 (BS 2782-11)	• Each type • Each batch of delivery • Each diameter	
15.37.7 Hydrostatic Leak Testing[83]	ASTM E1003	• Each line	
15.37.8 Ultrasonic Leak Testing[83]	ASTM E1002	• Each line	

[82] Footnote 88: Pipes, fittings, valves etc and/or products and materials conforming to BS 3505, ISO 1452-1, ISO 1452-2, ISO 1452-3, ISO 1452-4, ISO 1452-5 or equivalent shall be tested as per this section requirement as applicable.

[83] Footnote 89: It is sufficient for the Contractor to carry out either one of these Tests, whichever is deemed suitable for the site in consultation with the Engineer.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.38 PRECAST CONCRETE PIPES, MANHOLES, INSPECTION CHAMBERS ETC[84]			Refer to footnote
15.38.1 Dimensions	EN639, EN640, EN641, EN642	• Each batch of delivery • Each type • Change in material	
15.38.2 Hydrostatic Pressure Test, Pressure Testing, Watertightness Test	EN639, EN640, EN641, EN642	• Each batch of delivery • Each type • Change in material	
15.38.3 Hydrostatic Leak Testing	ASTM E1003, EN639, EN640, EN641	• Each batch of delivery • Each type • Change in material	
15.38.4 Ultrasonic Leak Testing	ASTM E1002	• Each line	
15.38.5 Low Pressure Air Test[85] - Sewerline	ASTM C924	• Each line	Refer to footnote
15.38.6 Negative Air Pressure (Vacuum)[85] - Sewerline	ASTM C1214	• Each line	Refer to footnote
15.38.7 Negative or Positive Air Pressure Test[85] - Concrete Sanitary Sewer Pipe	ASTM C1618	• Each line	Refer to footnote
15.38.8 Compressive Strength Test	EN639, EN640, EN641	• Each batch of delivery • Each type • Change in material	
15.38.9 Tensile Test - Reinforced Concrete Pressure Pipe	EN641	• Each batch of delivery • Each type • Change in material	
15.38.10 Angular Deflection, Bend Testing	EN639, EN640	• Each batch of delivery • Each type • Change in material	
15.38.11 Crushing Test	ASTM C497, EN639, EN640	• Each batch of delivery • Each type • Change in material	
15.38.12 Shear Testing	EN639	• Each batch of delivery • Each type • Change in material	

[84] Footnote 90: Pipes, (Reinforced) Concrete Pressure Pipes, Prestressed Concrete Pressure Pipes (Cylinder and Non-Cylinder Type), Distributed Reinforcement Concrete Pressure Pipes (Cylinder and Non-Cylinder Type), Fitting, Joints, Covers, Spigot-and-Socket Joints, Welded Joints, Sealing Rings, Pipe Couplings and/or materials and products conforming to BS 5911-1, BS 5911-3, BS 5911-4, BS 5911-6, EN1916, EN1917 or equivalent shall be tested as per this section requirement as applicable.

[85] Footnote 91: It is sufficient for the Contractor to carry out either one of these Tests, whichever is deemed suitable for the site in consultation with the Engineer.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.38.13 Prestressing Steel - Prestressed Concrete Pressure Pipes	EN642	• Each batch of delivery • Each type • Change in material	
15.38.14 Permeability - Prestressed Concrete Pressure Pipes, Concrete Pipes, Manholes	ASTM C497, EN642	• Each batch of delivery • Each type • Change in material	
15.38.15 Coating - Prestressed Concrete Pressure Pipes	EN642	• Each batch of delivery • Each type • Change in material	
15.38.16 Standard Tests - Concrete Pipe, Manhole Sections	ASTM C497	• As per Engineer's request	
15.38.17 Hydrogen Embrittlement Resistance - Prestressed Concrete Pipe	ASTM A1032	• As per the Engineer's request	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.39 VITRIFIED CLAY PIPES, JOINTS, MANHOLES ETC[86, 87]			Refer to footnote
15.39.1 Dimensions	EN295-3	• Each batch of delivery • Each Diameter • Each type • Change in material	
15.39.2 Barrel Permeability (Hydrostatic Infiltration)	ASTM C1091	• Each batch of delivery • Each Diameter • Each type • Change in material	
15.39.3 Straightness	EN295-3	• Each batch of delivery • Each Diameter • Each type • Change in material	
15.39.4 Bending Moment Resistance	EN295-3	• Each batch of delivery • Each Diameter • Each type • Change in material	
15.39.5 Tensile Testing	EN295-3	• Each batch of delivery • Each Diameter • Each type • Change in material	
15.39.6 Chemical Resistance	ASTM C301, EN295-3	• Each batch of delivery • Each Diameter • Each type • Change in material	
15.39.7 Leak Test, Water Test, Pressure Test	ASTM C828, EN295-3	• Each batch of delivery • Each type • Change in material	
15.39.8 Strength (Crushing)	ASTM C301, EN295-3	• Each batch of delivery • Each Diameter • Each type • Change in material	
15.39.9 Angular Deflection	EN295-3	• Each batch of delivery • Each Diameter • Each type • Change in material	
15.39.10 Fatigue Test, Wear Test, Roughness (Surface) Test	EN295-3	• As per the Engineer's request	
15.39.11 Thermal Testing	EN295-3	• As per the Engineer's request	

[86] Footnote 92: Ceramics, Pipes, Pipe fittings, Drainpipes, Pipe couplings, Joints, Sewers etc shall also be tested in accordance with this section requirement.

[87] Footnote 93: Products and materials conforming to EN295-1, EN295-2, EN295-4, EN295-5, EN295-6, EN295-7, EN295-10 or equivalent as applicable. The sampling shall be done in accordance with EN295-2, EN295-3 or equivalent as applicable.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.39.12 Water Absorption	ASTM C301	• Each batch of delivery • Each Diameter • Each type • Change in material	
15.39.13 Hydrostatic Leak Testing[88]	ASTM E1003	• Each line	Refer to footnote
15.39.14 Ultrasonic Leak Testing[88]	ASTM E1002	• Each line	Refer to footnote

[88] Footnote 94: It is sufficient for the Contractor to carry out either one of these Tests, whichever is deemed suitable for the site in consultation with the Engineer.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.40 GRP PIPES, FITTINGS, JOINTS, PLASTIC PIPING, PRC ETC[89, 90]			Refer to footnote
15.40.1 Dimensions	ASTM D2122, D3567, EN14636-1, EN14636-2	• 1 test per 30 pipes • Each Diameter • Each type • Change in material	
15.40.2 Visual Inspection	ASTM D2563	• All of the pipes	
15.40.3 Stiffness, Flexibility	ASTM D2412, EN14636-1	• 1 test per 30 pipes • Each Diameter • Each type • Change in material	
15.40.4 Hardness	ASTM D2583, EN14636-1, EN14636-2	• 1 test per 30 pipes • Each Diameter • Each type • Change in material	
15.40.5 Crushing Test	EN14636-1, EN14636-2	• 1 test per 30 pipes • Each Diameter • Each type • Change in material	
15.40.6 Strain Corrosion	As per relevant standards	• As per the Engineer's request	
15.40.7 Liner Thickness	As per relevant standards	• Each batch of delivery • Each type • Change in material	
15.40.8 Loss on Ignition	ASTM D2584	• As per the Engineer's request	
15.40.9 Leak Test (Water Test)	As per relevant standards	• Each batch of delivery • Each type • Change in material	
15.40.10 Hoop Tensile Strength	ASTM D638, D2290, EN14636-1, EN14636-2	• 1 test per 30 pipes • Each Diameter • Each type • Change in material	
15.40.11 Longitudinal, Axial Tensile Strength	ASTM D2290, EN14636-1, EN14636-2	• 1 test per 30 pipes • Each Diameter • Each type • Change in material	
15.40.12 Water Absorption	ASTM D570	• 1 test per 30 pipes • Each Diameter • Each type • Change in material	

[89] Footnote 95: Plastic Piping Systems for Non-Pressure Drainage and Sewer, Polyester Resin Concrete (PRC), Pipes and Fittings with Flexible Joints, Plastic Pipelines, Pipe Couplings, Drainpipes, Manholes and Inspection Chambers and/or products and materials conforming to EN1796, EN14364 or equivalent shall be tested as per this section requirement as applicable.

[90] Footnote 96: Sample preparation shall be in accordance with ASTM D618 or equivalent as applicable.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.40.13 Resistance to Short-Time Hydraulic Pressure	ASTM D1599	• As per the Engineer's request	
15.40.14 Compressive Properties	ASTM D695	• As per the Engineer's request	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.41 DUCTILE IRON (DI) PIPES, FITTINGS, FLANGE, ADAPTOR GASKETS, VALVES[91, 92]			Refer to footnote
15.41.1 Dimensions	EN545, EN598, EN1092-2, ISO 2531	• Each batch of delivery • Each Diameter • Each type • Change in material	
15.41.2 Operating Pressure	EN545, EN598, EN1092-2, ISO 2531	• Each batch of delivery • Each Diameter • Each type • Change in material	
15.41.3 Internal Lining	EN545, EN598, EN1092-2	• Each batch of delivery • Each Diameter • Each type • Change in material	
15.41.4 External Coating	EN545, EN598, EN1092-2, EN15189	• Each batch of delivery • Each Diameter • Each type • Change in material	
15.41.5 Wrapping Material	ASTM D1000, BS 2782-0, EN15189	• Each batch of delivery • Each type • Change in material	
15.41.6 Metal Pipe and Tubing	ASTM E213	• Each batch of delivery • Each Diameter • Each type • Change in material	
15.41.7 Hydrostatic Leak Testing[93]	ASTM E1003	• Each line	Refer to footnote
15.41.8 Ultrasonic Leak Testing[93]	ASTM E1002	• Each line	Refer to footnote
15.41.9 Rubber Gaskets, Seals, Joint Rings	ISO 4633	• Each batch of delivery • Each Diameter • Each type • Change in material	
15.41.10 Valves for all Purposes	EN1074-1, 1074-2, 1074-3, 1074-4, 1074-5, 1074-6	• Each batch of delivery • Each Diameter • Each type • Change in material	
15.41.11 Epoxy Coating - Ductile Iron Pipes, Fittings and Accessories	EN14901	• Each batch of delivery • Each type • Change in material	

[91] Footnote 97: DI Pipes, Spheroidal-graphite cast-iron, Cast-iron, Cast-iron pipelines, Pipe fittings, Pipe couplings, Pipes and Valves used for Water, Gas and Sewerage Pipelines, Isolating Valves, Check Valves, Air Valves, Control Valves, Protective Film Materials (BS6076) and/or product and material conforming to EN969, ISO 4633 or equivalent shall be tested in accordance with this section requirement as applicable.

[92] Footnote 98: Sampling shall be done in accordance with BS 6001-1 (ISO 2859-1) or equivalent as applicable.
[93] Footnote 99: It is sufficient for the Contractor to carry out either one of these Tests, whichever is deemed suitable for the site in consultation with the Engineer.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.41.12 Adhesion to Pipe - Internal Lining	ASTM D4541	• Each batch of delivery • Each type • Change in material	
15.41.13 Salt Spray Test - Internal Lining	ASTM B117	• Each batch of delivery • Each type • Change in material	
15.41.14 Pinhole Test, Spark Holiday Test - Internal, External Lining	ASTM D5162, G6, G62, BS 1344-11 (ISO 2746), ISO 8289	• Each batch of delivery • Each type • Change in material	
15.41.15 Sulphuric Acid Immersion Test, Corrosive Environment Test - Internal Lining	ASTM D714, D1654	• Each batch of delivery • Each type • Change in material	
15.41.16 Impact Resistance - Internal Lining	ASTM D2794	• As per the Engineer's request	
15.41.17 Abrasion Resistance - Internal Lining	ASTM D4060	• As per the Engineer's request	
15.41.18 Vapour Permeability - Internal Lining	ASTM D1653	• As per the Engineer's request	
15.41.19 Thickness - Internal Lining	ASTM G12, D6132, D7091	• As per the Engineer's request	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.42 ROAD SIGNS[94]			Refer to footnote
15.42.1 Performance	BS 8442, EN12899-1	• Each type • Change in material	
15.42.2 Luminance	BS 8442, EN12899-1	• Each type • Change in material	
15.42.3 Chromaticity, Photometry (Light Measurement)	BS 8442	• As per the Engineer's request	
15.42.4 Mechanical Testing, Impact Testing, Wind Loading, Environmental testing, Loading	BS 8442, EN12899-1	• Each type • Change in material	
15.42.5 Retroreflective Materials	EN12899-1	• Each type • Change in material	
15.42.6 Coefficient of Retroreflection, Reflection Factor	ASTM E810, EN12899-1	• Each type • Change in material	
15.42.7 Measurement of Retroreflective Signs	ASTM E1709, E2540	• Each type • Change in material	
15.42.8 Colorimetry & Colour	EN12899-1	• Each type • Change in material	
15.42.9 Lighting (Road Signs)	EN12899-1	• Each type • Change in material	
15.42.10 Galvanise Coating	ASTM A90, B487, E376, ISO 1461	• Each type • Change in material	
15.42.11 Dimensions	As per relevant standards	• Each type • Change in material	
15.42.12 Anchor Bolts	As per relevant standards	• Each type • Change in material	

[94] Footnote100: Road signs, Street furniture, Bollards (traffic), Signs, Warning devices, Portable, Fixed, Vertical Road Traffic Signs, Pedestrian-crossing lights, Flashing lights, Studs (road), Reflective materials, Lighting (road signs), Schools, Barriers etc and/or materials conforming to (ASTM A123) as applicable.

Material /Section / Activity[1, 2] & the Required Tests		Method[3]	Minimum Frequency[4, 5]	Remarks
15.43	**FLOORING, FLOOR COVERINGS, ADHESIVES FOR FLOORING ETC[95, 96]**			Refer to footnote
15.43.1	**Elasticity and Resistance to Wear, Wear Test**	EN1963, EN13329, EN13696	• Each type • Change in material	
15.43.2	**Bending Strength Under Static Load - Wood Flooring**	EN1533	• Each type • Change in material	
15.43.3	**Resistance to Indentation, Impact**	EN1534, EN13329, ISO 24335, ISO 24343-1	• Each type • Change in material	
15.43.4	**Dimensions (Changes, Stability and Curling), Flatness (Surface), Geometrical Characteristics**	ASTM F1514, BS 4682-2, BS 4682-3, BS 4682-4, BS 4805, BS 5921, EN426, EN427, EN662, EN669, EN986, EN994, EN1841, EN1910, EN13329, EN13647, ISO 17984, ISO 23999, ISO 24341	• Each type • Change in material	
15.43.5	**Changes in Appearance, Light Stability**	ASTM F1515, EN1471	• As per the Engineer's request	
15.43.6	**Resistance to Chemical Agents, Delamination, Cigarettes**	ASTM F925, EN1399, EN13442, ISO 11857	• Each type • Change in material	
15.43.7	**Performance, Adhesion, Mechanical, Ageing etc - Adhesives for Floor Covering**	EN14259, EN14293	• As per the Engineer's request	
15.43.8	**Electrical Resistance to Earth**	ASTM F150, BS 7078	• As per the Engineer's request	
15.43.9	**Mass, Mass Per Unit Area, Density**	EN718, EN984, EN672, ISO 8543	• Each type • Change in material	
15.43.10	**Overall Thickness, Pile Thickness Above the Backing, Substrate, Thickness Swelling**	ASTM F386, BS 5041 (ISO 1765), BS 4098, BS 4939 (ISO 3416), EN428, ISO 1766, ISO 10834, ISO 24336	• Each type • Change in material	

[95] Footnote 101: Floor coverings, Laminates, Sheet flooring, Panel flooring and/or materials and products conforming to BS 4050-2, BS 4592-0, EN685, EN1307, EN1470, EN13297, EN13329, EN13848, EN14259, EN14293, EN14342, EN14565, EN14978, EN15468, ISO 10874 or equivalent shall also be tested as per this section as applicable.

[96] Footnote 102: Sampling of material and products shall be in accordance with EN14259, EN14762 or equivalent as applicable.

15.43.11	**Lock Strength - Laminate Floor Coverings**	ISO 24334	• As per the Engineer's request	
15.43.12	**Scratch Tests, Surface Defects, Humidity - Acrylic Based Surface Layer**	EN14978	• As per the Engineer's request	
15.43.13	**Caster Chair Test - Textile Floor Coverings**	EN985	• As per the Engineer's request	
15.43.14	**Volatile Organic Compound (VOC) Emissions, Volatile Loss**	EN664, ISO 10580	• As per the Engineer's request	
15.43.15	**Identification of Linoleum and Determination of Cement Content and Ash Residue - Resilient Floor Coverings**	EN670, ISO 26985	• As per the Engineer's request	
15.43.16	**Flexibility - Resilient Flooring Materials**	ASTM F137	• As per the Engineer's request	
15.43.17	**Seam Strength - Resilient Floor Coverings**	EN684	• As per the Engineer's request	
15.43.18	**Reaction to Fire Tests, Effects of a Small Source of Ignition**	BS 4790, ISO 9239-1	• Each type • Change in material	
15.43.19	**Gelling - Resilient Floor Coverings**	EN666	• As per the Engineer's request	
15.43.20	**Conventional Pattern Depths - Resilient Floor Coverings**	EN663	• As per the Engineer's request	
15.43.21	**Spreading of Water, Moisture Content**	EN661, EN12105	• Each type • Change in material	
15.43.22	**Exudation of Plasticizers - Resilient Floor Coverings**	EN665	• As per the Engineer's request	
15.43.23	**Kerosine Number - Roofing and Flooring Felt**	ASTM D727	• As per the Engineer's request	
15.43.24	**Staining of Vinyl Flooring by Adhesives**	ASTM D5215	• Each type • Change in material	
15.43.25	**Static Coefficient of Friction**	ASTM D2047	• Each type • Change in material	
15.43.26	**Simulated Services - Wood Flooring**	ASTM D2394	• As per the Engineer's request	

15.43.27 Long-Side Friction - Laminate Floor Coverings	ISO 25620	• Each type • Change in material	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.44 CERAMIC FOR ELECTRICAL APPLIANCES			
15.44.1 Vitrified Ceramic Materials for Electrical Appliances	ASTM D116	• Each type • Change in material	
15.44.2 Flexural Strength - Electronic Grade 3 Ceramic	ASTM F417	• Each type • Change in material	

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.45 GULLIES, GRATINGS, MANHOLE COVERS ETC[97]			Refer to footnote
15.45.1 Mechanical testing - Gullies	EN1253-2	• Each type • Change in material	
15.45.2 Dimensions - Gullies	EN1253-2	• Each type • Change in material	
15.45.3 Seals - Gullies	EN1253-2	• Each type • Change in material	
15.45.4 Pressure Testing Leak Tests Watertightness Tests - Gullies	EN1253-2	• Each type • Change in material	
15.45.5 Odours - Gullies	EN1253-2	• Each type • Change in material	
15.45.6 Thermal-cycling Tests - Gullies	EN1253-2	• Each type • Change in material	
15.45.7 Flow Rates, Flow Measurement, Siphons - Gullies	EN1253-2	• Each type • Change in material	
15.45.8 Sheet Flooring, Membranes - Gullies	EN1253-2	• Each type • Change in material	
15.45.9 Deflection Tests, Strength of Materials - Gullies, Manhole Covers	EN124, EN1253-2	• Each type • Change in material	
15.45.10 Load Test - Manhole Covers	EN124	• Each type • Change in material	

[97] Footnote 103: Gullies, Gullies with light liquids closure, Manholes, Access covers, Waste-water drainage, Drainage, Surface-water drainage, Water supply, Waste systems, Rainwater control systems etc shall be tested as per this section requirement as applicable and/or Products and Materials conforming to EN124, EN1253-1, Spheroidal graphite cast irons (ISO 1083), Gray cast iron (ISO 185) or equivalent shall also be tested in accordance with this section requirement as applicable.

Material /Section / Activity[1, 2] & the Required Tests	Method[3]	Minimum Frequency[4, 5]	Remarks
15.45.11 Type Testing - Manhole Covers	EN124	• Each type • Change in material	
15.45.12 Epoxy Coating[98] - Manhole Covers	ASTM D1005, D6132, D7091, EN124	• Each type • Change in material	Refer to footnote

[98] Footnote 104: The minimum thickness of the Epoxy Coating shall be 50 microns unless otherwise specified.

15.46 REFERENCES

The following standards are applicable to this section:

15.46.1 American Association of State Highway and Transportation Officials (AASHTO) :

1 AASHTO M17 - Standard Specification for Mineral Filler for Bituminous Paving Mixtures

2 AASHTO M20 - Standard Specification for Penetration-Graded Asphalt Cement

3 AASHTO M81 - Standard Specification for Cutback Asphalt (Rapid-Curing Type)

4 AASHTO M82 - Standard Specification for Cutback Asphalt (Medium-Curing Type)

5 AASHTO M85 - Standard Specification for Portland Cement

6 AASHTO M140 - Standard Specification for Emulsified Asphalt.

7 AASHTO M145 - Standard Specification for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes

8 AASHTO M148 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete

9 AASHTO M171 - Standard Specification for Sheet Materials for Curing Concrete

10 AASHTO M182 - Standard Specification for Burlap Cloth Made from Jute or Kenaf and Cotton Mats

11 AASHTO M208 - Standard Specification for Cationic Emulsified Asphalt.

12 AASHTO M226 - Standard Specification for Viscosity-Graded Asphalt Cement

13 AASHTO M249 - Standard Specification for White and Yellow Reflective Thermoplastic Striping Material (Solid Form)

14 AASHTO R28 - Standard Practice for Accelerated Aging of Asphalt Binder Using a Pressurized Aging Vessel (PAV)

15 AASHTO R13 - Standard Practice for Conducting Geotechnical Subsurface Investigations

16 AASHTO R32 - Standard Recommended Practice for Calibrating the Load Cell and Deflection Sensors for a Falling Weight Deflectormeter

17 AASHTO R37 - Standard Practice for Application of Ground Penetrating Radar (GPR) to Highways

18 AASHTO R39 - Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory

19 AASHTO R40 - Standard Practice for Measuring Pavement Profile Using a Rod and Level

20 AASHTO T2 - Standard Method of Test for Sampling of Aggregates

21 AASHTO T11 - Standard Method of Test for Materials Finer Than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing

22 AASHTO T21 - Standard Method of Test for Organic Impurities in Fine Aggregates for Concrete

23 AASHTO T22 - Standard Method of Test for Compressive Strength of Cylindrical Concrete Specimens

24 AASHTO T23 - Standard Method of Test for Making and Curing Concrete Test Specimens in the Field

25 AASHTO T24 - Standard Method of Test for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete

26 AASHTO T26 - Standard Method of Test for Quality of Water to be Used in Concrete.

27 AASHTO T27 - Standard Method of Test for Sieve Analysis of Fine and Coarse Aggregates.

28 AASHTO T30 - Standard Method of Test for Mechanical Analysis of Extracted Aggregate.

29 AASHTO T37 - Standard Method of Test for Sieve Analysis of Mineral Filler for Hot Mix Asphalt (HMA)

30 AASHTO T40 - Standard Method for Sampling Bituminous Materials.

31 AASHTO T44 - Standard Method of Test for Solubility of Bituminous Materials.

32 AASHTO T48 - Standard Method of Test for Flash and Fire Points by Cleveland Open Cup.

33 AASHTO T49 - Standard Method of Test for Penetration of Bituminous Materials.

34 AASHTO T51 - Standard Method of Test for Ductility of Asphalt Materials

35 AASHTO T53 - Standard Method of Test for Softening Point of Bitumen (Ring-and-Ball Apparatus)

36 AASHTO T55 - Standard Method of Test for Water in Petroleum Products and Bituminous Materials by Distillation

37 AASHTO T59 - Standard Method for Testing Emulsified Asphalts.

38 AASHTO T71 - Standard Method of Test for Effect of Organic Impurities in Fine Aggregate on Strength of Mortar

39 AASHTO T84 - Standard Method of Test for Specific Gravity and Absorption of Fine Aggregate

40 AASHTO T85 - Standard Method of Test for Specific Gravity and Absorption of Coarse Aggregate

41 AASHTO T87 - Standard Method of Test for Dry Preparation of Disturbed Soil and Soil-Aggregate Samples for Test

42 AASHTO T88 - Standard Method of Test for Particle Size Analysis of Soils.

43 AASHTO T89 - Standard Method of Test for Determining the Liquid Limit of Soils.

44 AASHTO T90 - Standard Method of Test for Determining the Plastic Limit and Plasticity Index of Soils.

45 AASHTO T92 - Standard Method of Test for Determining the Shrinkage Factors of Soils.

46 AASHTO T96 - Standard Method of Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

47 AASHTO T98 - Standard Method of Test for Fineness of Portland Cement by the Turbidimeter

48 AASHTO T99 - Standard Method of Test for Moisture-Density Relations of Soils Using a 2.5-kg (5.5-lb) Rammer and a 305-mm (12-in.) Drop.

49 AASHTO T100 - Standard Method of Test for Specific Gravity of Soils

50 AASHTO T102 - Standard Method of Test for Spot Test of Asphaltic Materials, Single User Digital Publication

51 AASHTO T104 - Standard Method of Test for Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate

52 AASHTO T105 - Standard Method of Test for Chemical Analysis of Hydraulic Cement

53 AASHTO T106 - Standard Method of Test for Compressive Strength of Hydraulic Cement Mortar (Using 50-mm or 2-in. Cube Specimens)

54 AASHTO T107 - Standard Method of Test for Autoclave Expansion of Hydraulic Cement

55 AASHTO T112 - Standard Method of Test for Clay Lumps and Friable Particles in Aggregate

56 AASHTO T113 - Standard Method of Test for Lightweight Pieces in Aggregate

57 AASHTO T119 - Standard Specification for Slump of Hydraulic Cement Concrete

58 AASHTO T121 - Standard Method of Test for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete

59 AASHTO T129 - Standard Method of Test for Normal Consistency of Hydraulic Cement

60 AASHTO T131 - Standard Method of Test for Time of Setting of Hydraulic Cement by Vicat Needle

61 AASHTO T133 - Standard Method of Test for Density of Hydraulic Cement

62 AASHTO T146 - Standard Method of Test for Wet Preparation of Disturbed Soil Samples for Test

63 AASHTO T152 - Standard Method of Test for Air Content of Freshly Mixed Concrete by the Pressure Method

64 AASHTO T153 - Standard Method of Test for Fineness of Hydraulic Cement by Air Permeability Apparatus

65 AASHTO T155 - Standard Method of Test for Water Retention by Liquid Membrane-Forming Curing Compunds for Concrete

66 AASHTO T164 - Standard Method of Test for Quantitative Extraction of Bituminous Paving Mixtures.

67 AASHTO T165 - Standard Method of Test for Effect of Water on Compressive Strength of Compacted Bituminous Mixtures

68 AASHTO T166 - Standard Method of Test for Bulk Specific Gravity of Compacted Hot Mix Asphalt (HMA) Using Saturated Surface-Dry Specimens

69 AASHTO T168 - Standard Method of Test for Sampling Bituminous Paving Mixtures.

70 AASHTO T176 - Standard Method of Test for Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test.

71 AASHTO T179 - Standard Method of Test for Effect of Heat and Air on Asphalt Materials (Thin-Film Oven Test)

72 AASHTO T180 - Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54 kg (10 lb) Rammer and a 457 mm (18 in.) Drop.

73 AASHTO T191 - Standard Method of Test for Density of Soil In-Place by the Sand-Cone Method.

74 AASHTO T193 - Standard Method of Test for the California Bearing Ratio.

75 AASHTO T195 - Standard Method of Test for Determining Degree of Particle Coating of Asphalt Mixtures

76 AASHTO T196 - Standard Method of Test for Air Content of Freshly Mixed Concrete by the Volumetric Method

77 AASHTO T201 - Standard Method of Test for Kinematic Viscosity of Asphalts (Bitumens)

78 AASHTO T202 - Standard Method of Test for Viscosity of Asphalts by Vacuum Capillary Viscometer

79 AASHTO T205 - Standard Method of Test for Density of Soil In-Place by the Rubber Balloon Method.

80 AASHTO T206 - Standard Method of Test for Penetration Test and Split-Barrel Sampling of Soils

81 AASHTO T209 - Standard Method of Test for Theoretical Maximum Specific Gravity and Density of Hot Mix Asphalt (HMA)

82 AASHTO T211 - Standard Method of Test for Determination of Cement Content in Cement-Treated Aggregate by the Method of Titration

83 AASHTO T216 - Standard Method of Test for One-Dimensional Consolidation Properties of Soils

84 AASHTO T219 - Standard Method of Test for Testing Lime for Chemical Constituents and Particle Sizes

85 AASHTO T222 - Standard Method of Test for Non-repetitive Static Plate Load Test of Soils and Flexible Pavement Components, for Use in Evaluation and Design of Airport and Highway Pavements

86 AASHTO T223 - Standard Method of Test for Field Vane Shear Test in Cohesive Soil.

87 AASHTO T224 - Standard Method of Test for Correction for Coarse Particles in the Soil Compaction Test.

88 AASHTO T228 - Standard Method of Test for Specific Gravity of Semi-Solid Asphalt Materials

89 AASHTO T236 - Standard Method of Test for Direct Shear Test of Soils under Consolidated Drained Conditions

90 AASHTO T238 - Standard Method of Test for Density of Soil and Soil-Aggregate In-Place by Nuclear Methods (Shallow Depth).

91 AASHTO T239 - Standard Method of Test for Moisture Content of Soil and Soil-Aggregate In-Place by Nuclear Methods (Shallow Depth).

92 AASHTO T240 - Standard Method of Test for Effect of Heat and Air on a Moving Film of Asphalt (Rolling Thin-Film Oven Test)

93 AASHTO T245 - Standard Method of Test for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus

94 AASHTO T248 - Reducing Aggregate Samples to Testing Size

95 AASHTO T250 - Standard Method of Test for Thermoplastic Traffic Line Material

96 AASHTO T255 - Standard Method of Test for Total Evaporable Moisture Content of Aggregate by Drying

97 AASHTO T256 - Standard Method of Test for Pavement Deflection Measurements

98 AASHTO T259 - Standard Method of Test for Resistance of Concrete to Chloride Ion Penetration

99 AASHTO T265 - Laboratory Determination of Moisture Content of Soils.

100 AASHTO T267 - Determination of Organic Content in Soils by Loss on Ignition.

101 AASHTO T269 - Standard Method of Test for Percent Air Voids in Compacted Dense and Open Asphalt Mixtures

102 AASHTO T271 - Standard Method of Test for Density of Plastic and Hardened Portland Cement Concrete In-Place by Nuclear Methods

103 AASHTO T275 - Standard Method of Test for Bulk Specific Gravity of Compacted Hot Mix Asphalt (HMA) Using Paraffin-Coated Specimens

104 AASHTO T277 - Standard Method of Test for Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration

105 AASHTO T283 - Standard Method of Test for Resistance of Compacted Hot Mix Asphalt (HMA) to Moisture-Induced Damage

106 AASHTO T290 - Standard Method of Test for Determining Water Soluble Sulphate Ion Content in Soil.

107 AASHTO T291 - Standard Method of Test for Determining Water-Soluble Chloride Ion Content in Soil.

108 AASHTO T299 - Standard Method of Test for Rapid Identification of Alkali-Silica Reaction Products in Concrete

109 AASHTO T301 - Standard Method of Test for Elastic Recovery Test of Asphalt Materials by Means of a Ductilometer

110 AASHTO T304 - Standard Method of Test for Uncompacted Void Content of Fine Aggregate.

111 AASHTO T308 - Standard Method of Test for Determining the Asphalt Binder Content of Hot Mix Asphalt (HMA) by the Ignition Method.

112 AASHTO T309 - Standard Method of Test for Temperature of Freshly Mixed Hydraulic Cement Concrete

113 AASHTO T310 - Standard Specification for In-Place Density and Moisture Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth), Single User Digital Publication

114 AASHTO T312 - Standard Method of Test for Preparing and Determining the Density of Hot Mix Asphalt (HMA) Specimens by Means of the Superpave Gyratory Compactor

115 AASHTO T313 - Standard Method of Test for Determining the Flexural Creep Stiffness of Asphalt Binder Using the Bending Beam Rheometer (BBR)

116 AASHTO T314 - Standard Method of Test for Determining the Fracture Properties of Asphalt Binder in Direct Tension (DT)

117 AASHTO T315 - Standard Method of Test for Determining the Rheological Properties of Asphalt Binder Using a Dynamic Shear Rheometer (DSR)

118 AASHTO T316 - Standard Method of Test for Viscosity Determination of Asphalt Binder Using Rotational Viscometer

119 AASHTO T327 - Standard Method of Test for Resistance of Coarse Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus.

15.46.2 International Organisation for Standardization (ISO):

1 ISO185 - 2005 Grey cast iron - Classification

2 ISO 1083 - Spheroidal graphite cast irons - Classification

3 ISO 4633 - Rubber seals - Joint rings for water supply, drainage and sewerage pipelines- Specification for materials

4 ISO 15835-2 - Steels for the reinforcement of concrete. Reinforcement couplers for mechanical splices of bars. Test methods

15.46.3 Asphalt Institute (AI):

1 AI MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot Mix Types.

15.46.4 American Petroleum Institute (API):

1 API RP 13B-1 - Recommended Practice for Standard Procedure for Field Testing of Water-Based Drilling Fluids.

15.46.5 American Concrete Society (ACI):

1 ACI 318 - Building Code Requirements for Structural Concrete and Commentary

2

15.46.6 American Society for Testing and Materials (ASTM): [Note: Where available/applicable the ASTM version used should be the metric edition, ie, 'M version' (or ASTM D1234M etc).]

1 ASTM A36 - Standard Specification for Carbon Structural Steel

2 ASTM A47 - Standard Specification for Ferritic Malleable Iron Castings

3 ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless

4 ASTM A90 - Standard Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings

5 ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

6 ASTM A255 - Standard Test Methods for Determining Hardenability of Steel

7 ASTM A370 - Standard Test Methods and Definitions for Mechanical Testing of Steel Products.

8 ASTM A416 - Standard Specification for Steel Strand, Uncoated Seven-Wire for Prestressed Concrete

9 ASTM A421 - Standard Specification for Uncoated Stress-Relieved Steel Wire for Prestressed Concrete

10 ASTM A426 - Standard Specification for Centrifugally Cast Ferritic Alloy Steel Pipe for High-Temperature Service

11 ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes

12 ASTM A673 - Standard Specification for Sampling Procedure for Impact Testing of Structural Steel

13 ASTM A722 - Standard Specification for Uncoated High-Strength Steel Bars for Prestressing Concrete

14 ASTM A751 - Standard Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products

15 ASTM A931 - Standard Test Method for Tension Testing of Wire Ropes and Strand

16 ASTM A938 - Standard Test Method for Torsion Testing of Wire

17 ASTM A981 - Standard Test Method for Evaluating Bond Strength for 0.600-in. [15.24-mm] Diameter Steel Prestressing Strand, Grade 270 [1860], Uncoated, Used in Prestressed Ground Anchors

18 ASTM A1032 - Standard Test Method for Hydrogen Embrittlement Resistance for Steel Wire Hard Drawn Used for Prestressing Concrete Pipe

19 ASTM A1034 - Standard Test Methods for Testing Mechanical Splices for Steel Reinforcing Bars

20 ASTM A1061 - Standard Test Methods for Testing Multi-Wire Steel Strand

21 ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus

22 ASTM B487 - Standard Test Method for Measurement of Metal and Oxide Coating Thickness by Microscopical Examination of Cross Section

23 ASTM B557 - Standard Test Methods for Tension Testing Wrought and Cast Aluminum- and Magnesium-Alloy Products

24 ASTM C25 - Standard Test Methods for Chemical Analysis of Limestone, Quicklime, and Hydrated Lime

25 ASTM C29 - Standard Test Method for Bulk Density (Unit Weight) and Voids in Aggregate

26 ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.

27 ASTM C33 - Standard Specification for Concrete Aggregates.

28 ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

29 ASTM C40 - Standard Test Method for Organic Impurities in Fine Aggregates for Concrete.

30 ASTM C42 - Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.

31 ASTM C50 - Standard Practice for Sampling, Sample Preparation, Packaging, and Marking of Lime and Limestone Products

32 ASTM C51 - Standard Terminology Relating to Lime and Limestone (as used by the Industry)

33 ASTM C67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile

34 ASTM C70 - Standard Test Method for Surface Moisture in Fine Aggregate

35 ASTM C87 - Standard Test Method for Effect of Organic Impurities in Fine Aggregate on Strength of Mortar

36 ASTM C88 - Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.

37 ASTM C91 - Standard Specification for Masonry Cement.

38 ASTM C94 - Standard Specification for Ready-Mixed Concrete

39 ASTM C97 - Standard Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone

40 ASTM C99 - Standard Test Method for Modulus of Rupture of Dimension Stone

41 ASTM C109 - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 in. or 50 mm Cube Specimens).

42 ASTM C110 - Standard Test Methods for Physical Testing of Quicklime, Hydrated Lime, and Limestone

43 ASTM C114 - Standard Test Methods for Chemical Analysis of Hydraulic Cement.

44 ASTM C115 - Standard Test Method for Fineness of Portland Cement by the Turbidimeter.

45 ASTM C117 - Standard Test Method for Material Finer Than 75 μm (No. 200) Sieve in Mineral Aggregates by Washing.

46 ASTM C120 - Standard Test Methods of Flexure Testing of Slate (Breaking Load, Modulus of Rupture, Modulus of Elasticity)

47 ASTM C121 - Test Method for Water Absorption of Slate

48 ASTM C123 - Standard Test Method for Lightweight Particles in Aggregates.

49 ASTM C127 - Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate

50 ASTM C128 - Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate

51 ASTM C131 - Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

52 ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

53 ASTM C138 - Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete

54 ASTM C140 - Standard Test Methods of Sampling and Testing Concrete Masonry Units.

55 ASTM C142 - Standard Test Method for Clay Lumps and Friable Particles in Aggregates.

56 ASTM C143 - Standard Test Method for Slump of Hydraulic Cement Concrete.

57 ASTM C144 - Standard Specification for Aggregates for Masonry Mortar.

58 ASTM C150 - Standard Specification for Portland Cement.

59 ASTM C151 - Standard Test Method for Autoclave Expansion of Portland Cement.

60 ASTM C156 - Standard Test Method for Water Retention by Concrete Curing Materials.

61 ASTM C157 - Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete

62 ASTM C170 - Standard Test Method for Compressive Strength of Dimension Stone

63 ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete

64 ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.

65 ASTM C173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method

66 ASTM C183 - Standard Practice for Sampling and the Amount of Testing of Hydraulic Cement

67 ASTM C185 - Standard Test Method for Air Content of Hydraulic Cement Mortar

68 ASTM C187 - Standard Test Method for Normal Consistency of Hydraulic Cement

69 ASTM C188 - Standard Test Method for Density of Hydraulic Cement

70 ASTM C191 - Standard Test Method for Time of Setting of Hydraulic Cement by Vicat Needle.

71 ASTM C192 - Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory

72 ASTM C203 - Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation

73 ASTM C204 - Standard Test Method for Fineness of Hydraulic Cement by Air Permeability Apparatus.

74 ASTM C217 - Standard Test Method for Weather Resistance of Slate

75 ASTM C227 - Standard Test Method for Potential Alkali Reactivity of Cement-Aggregate Combinations (Mortar-Bar Method).

76 ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method

77 ASTM C232 - Standard Test Methods for Bleeding of Concrete

78 ASTM C233 - Test Method for Air-Entraining Admixtures for Concrete

79 ASTM C241 - Standard Test Method for Abrasion Resistance of Stone Subjected to Foot Traffic

80 ASTM C265 - Standard Test Method for Calcium Sulfate in Hydrated Portland Cement Mortar.

81 ASTM C266 - Standard Test Method for Time of Setting of Hydraulic Cement Paste by Gillmore Needles.

82 ASTM C270 - 10 Standard Specification for Mortar for Unit Masonry

83 ASTM C289 - Standard Test Method for Potential Alkali-Silica Reactivity of Aggregates for Concrete.

84 ASTM C295 - Standard Guide for Petrographic Examination of Aggregates for Concrete.

85 ASTM C301 - Standard Test Methods for Vitrified Clay Pipe

86 ASTM C307 - Standard Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacings

87 ASTM C308 - Standard Test Methods for Working, Initial Setting, and Service Strength Setting Times of Chemical-Resistant Resin Mortars

88 ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

89 ASTM C311 - Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use as a Mineral Admixture in Portland-Cement Concrete.

90 ASTM C330 - Standard Specification for Lightweight Aggregates for Structural Concrete.

91 ASTM C348 - Standard Test Method for Flexural Strength of Hydraulic-Cement Mortars

92 ASTM C349 - Standard Test Method for Compressive Strength of Hydraulic-Cement Mortars (Using Portions of Prisms Broken in Flexure)

93 ASTM C373 - Standard Test Method for Water Absorption, Bulk Density, Apparent Porosity, and Apparent Specific Gravity of Fired Whiteware Products

94 ASTM C403 - Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance

95 ASTM C404 - Standard Specification for Aggregates for Masonry Grout

96 ASTM C413 - Standard Test Method for Absorption of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes

97 ASTM C418 - Test Method for Abrasion Resistance of Concrete by Sandblasting

98 ASTM C430 - Standard Test Method for Fineness of Hydraulic Cement by the 45-µm (No. 325) Sieve

99 ASTM C451 - Standard Test Method for Early Stiffening of Hydraulic Cement (paste Method).

100 ASTM C452 - Standard Test Method for Potential Expansion of Portland Cement Mortars Exposed to Sulphate.

101 ASTM C469 - Standard Test Method for Static Modulus of Elasticity and Poisson's Ratio of Concrete in Compression

102 ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete

103 ASTM C476 - Standard Specification for Grout for Masonry

104 ASTM C479 - Standard Specification for Vitrified Clay Liner Plates

105 ASTM C482 - Standard Test Method for Bond Strength of Ceramic Tile to Portland Cement Paste

106 ASTM C485 - Standard Test Method for Measuring Warpage of Ceramic Tile

107 ASTM C494 -Standard Specification for Chemical Admixtures for Concrete.

108 ASTM C497 - Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile

109 ASTM C531 - Standard Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes

110 ASTM C535 - Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

111 ASTM C566 - Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying

112 ASTM C579 - Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes

113 ASTM C580 - Standard Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes

114 ASTM C586 - Standard Test Method for Potential Alkali Reactivity of Carbonate Rocks as Concrete Aggregates (Rock-Cylinder Method)

115 ASTM C597 - Standard Test Method for Pulse Velocity Through Concrete

116 ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.

117 ASTM C641 - Standard Test Method for Iron Staining Materials in Lightweight Concrete Aggregates

118 ASTM C642 - Standard Test Method for Specific Gravity, Absorption, and Voids in Hardened Concrete.

119 ASTM C702 - Standard Practice for Reducing Samples of Aggregate to Testing Size.

120 ASTM C779 - Test Method for Abrasion Resistance of Horizontal Concrete Surfaces

121 ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry

122 ASTM C793 - Standard Test Method for Effects of Laboratory Accelerated Weathering on Elastomeric Joint Sealants

123 ASTM C803 - Standard Test Method for Penetration Resistance of Hardened Concrete

124 ASTM C805 - Standard Test Method for Rebound Number of Hardened Concrete

125 ASTM C823 - Standard Practice for Examination and Sampling of Hardened Concrete in Constructions

126 ASTM C827 - Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures.

127 ASTM C828 - Standard Test Method for Low-Pressure Air Test of Vitrified Clay Pipe Lines

128 ASTM C836 - Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course

129 ASTM C856 - Standard Practice for Petrographic Examination of Hardened Concrete

130 ASTM C876 - Standard Test Method for Half-Cell Potentials of Uncoated Reinforcing Steel in Concrete

131 ASTM C880 - Standard Test Method for Flexural Strength of Dimension Stone

132 ASTM C881 - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete

133 ASTM C882 - Standard Test Method for Bond Strength of Epoxy-Resin Systems Used With Concrete By Slant Shear

134 ASTM C900 - Standard Test Method for Pullout Strength of Hardened Concrete

135 ASTM C920 - Standard Specification for Elastomeric Joint Sealants

136 ASTM C924 - Standard Practice for Testing Concrete Pipe Sewer Lines by Low-Pressure Air Test Method

137 ASTM C936 - Standard Specification for Solid Concrete Interlocking Paving Units

138 ASTM C939 - Standard Test Method for Flow of Grout for Preplaced-Aggregate Concrete (Flow Cone Method)

139 ASTM C940 - Standard Test Method for Expansion and Bleeding of Freshly Mixed Grouts for Preplaced-Aggregate Concrete in the Laboratory

140 ASTM C942 - Standard Test Method for Compressive Strength of Grouts for Preplaced-Aggregate Concrete in the Laboratory

141 ASTM C944 - Test Method for Abrasion Resistance of Concrete or Mortar Surfaces by the Rotating-Cutter Method

142 ASTM C952 - Standard Test Method for Bond Strength of Mortar to Masonry Units

143 ASTM C953 - Standard Test Method for Time of Setting of Grouts for Preplaced-Aggregate Concrete in the Laboratory.

144 ASTM C989 - Standard Specification for Ground Granulated Blast-Furnace Slag for use in Concrete and Mortars.

145 ASTM C1012 - Test Method for Length Change of Hydraulic-Cement Mortars Exposed to a Sulfate Solution

146 ASTM C1017 - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.

147 ASTM C1019 - Standard Test Method for Sampling and Testing Grout

148 ASTM C1040 - Standard Test Methods for In-Place Density of Unhardened and Hardened Concrete, Including Roller Compacted Concrete, By Nuclear Methods

149 ASTM C1059 - Standard Specification for Latex Agents for Bonding Fresh To Hardened Concrete

150 ASTM C1064 - Standard Test Method for Temperature of Freshly Mixed Portland-Cement Concrete.

151 ASTM C1072 - Standard Test Method for Measurement of Masonry Flexural Bond Strength

152 ASTM C1084 - Standard Test Method for Portland-Cement Content of Hardened Hydraulic-Cement Concrete

153 ASTM C1091 - Standard Test Method for Hydrostatic Infiltration Testing of Vitrified Clay Pipe Lines

154 ASTM C1138 - Standard Test Method for Abrasion Resistance of Concrete (Underwater Method)

155 ASTM C1152 - Standard Test Method for Acid-Soluble Chloride in Mortar and Concrete

156 ASTM C1201 - Standard Test Method for Structural Performance of Exterior Dimension Stone Cladding Systems by Uniform Static Air Pressure Difference

157 ASTM C1202 - Standard Test Method for Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration

158 ASTM C1214 - Standard Test Method for Concrete Pipe Sewerlines by Negative Air Pressure (Vacuum) Test Method

159 ASTM C1218 - Standard Test Method for Water-Soluble Chloride in Mortar and Concrete.

160 ASTM C1240 - Standard Specification for Silica Fume for Use as a Mineral Admixture in Hydraulic-Cement Concrete, Mortar, and Grout.

161 ASTM C1250 - 05 Standard Test Method for Nonvolatile Content of Cold Liquid-Applied Elastomeric Waterproofing Membranes

162 ASTM C1252 - Standard Test Methods for Uncompacted Void Content of Fine Aggregate (as Influenced by Particle Shape, Surface Texture, and Grading)

163 ASTM C1260 - Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)

164 ASTM C1293 - Standard Test Method for Determination of Length Change of Concrete Due to Alkali-Silica Reaction

165 ASTM C1305 - Standard Test Method for Crack Bridging Ability of Liquid-Applied Waterproofing Membrane

166 ASTM C1306 - Standard Test Method for Hydrostatic Pressure Resistance of a Liquid-Applied Waterproofing Membrane

167 ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete

168 ASTM C1324 - Standard Test Method for Examination and Analysis of Hardened Masonry Mortar

169 ASTM C1352 - Standard Test Method for Flexural Modulus of Elasticity of Dimension Stone

170 ASTM C1353 - Standard Test Method for Abrasion Resistance of Dimension Stone Subjected to Foot Traffic Using a Rotary Platform, Double-Head Abraser

171 ASTM C1354 - Standard Test Method for Strength of Individual Stone Anchorages in Dimension Stone

172 ASTM C1357 - Standard Test Methods for Evaluating Masonry Bond Strength

173 ASTM C1437 Standard Test Method for Flow of Hydraulic Cement Mortar

174 ASTM C1506 - Standard Test Method for Water Retention of Hydraulic Cement-Based Mortars and Plasters

175 ASTM C1522 - Standard Test Method for Extensibility After Heat Aging of Cold Liquid-Applied Elastomeric Waterproofing Membranes

176 ASTM C1543 - Standard Test Method for Determining the Penetration of Chloride Ion into Concrete by Ponding

177 ASTM C1567 - Standard Test Method for Determining the Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated Mortar-Bar Method)

178 ASTM C1580 - Standard Test Method for Water-Soluble Sulfate in Soil.

179 ASTM C1583 - Standard Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-off Method)

180 ASTM C1611 - Standard Test Method for Slump Flow of Self-Consolidating Concrete

181 ASTM C1618 - Standard Test Method for Concrete Sanitary Sewer Pipe by Negative (Vacuum) or Positive Air Pressure

182 ASTM C1721 - Standard Guide for Petrographic Examination of Dimension Stone

183 ASTM D4 - Standard Test Method for Bitumen Content

184 ASTM D5 - Standard Test Method for Penetration of Bituminous Materials.

185 ASTM D6 - Standard Test Method for Loss on Heating of Oil and Asphaltic Compounds

186 ASTM D36 - Standard Test Method for Softening Point of Bitumen (Ring-and-Ball Apparatus)

187 ASTM D41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing

188 ASTM D70 - Standard Test Method for Density of Semi-Solid Bituminous Materials (Pycnometer Method)

189 ASTM D75 - Standard Practice for Sampling Aggregates.

190 ASTM D88 - Standard Test Method for Saybolt Viscosity

191 ASTM D92 - Standard Test Method for Flash and Fire points by Cleveland Open Cup.

192 ASTM D93 - Test Methods for Flash Point by Pensky-Martens Closed Cup Tester

193 ASTM D95 - Standard Test Method for Water in Petroleum Products and Bituminous Materials by Distillation.

194 ASTM D113 - Standard Test Method for Ductility of Bituminous Materials.

195 ASTM D140 - Standard Test Practice for Sampling Bituminous Materials.

196 ASTM D146 - Standard Test Methods for Sampling and Testing Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing

197 ASTM D228 - Standard Test Methods for Sampling, Testing, and Analysis of Asphalt Roll Roofing, Cap Sheets, and Shingles Used in Roofing and Waterproofing

198 ASTM D242 - Standard Specification for Mineral Filler For Bituminous Paving Mixtures

199 ASTM D243 - Standard Test Method for Residue of Specified Penetration.

200 ASTM D244 - Standard Test Methods and Practices for Emulsified Asphalts

201 ASTM D297 - Standard Test Methods for Rubber Products-Chemical Analysis

202 ASTM D402 - Standard Test Method for Distillation of Cut-Back Asphaltic (Bituminous) Products.

203 ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension.

204 ASTM D413 - Standard Test Methods for Rubber Property—Adhesion to Flexible Substrate

205 ASTM D420 - Standard Practice for Investigating and Sampling Soil and Rock for Engineering Purposes.

206 ASTM D421 - Standard Practice for Dry Preparation of Soil Samples for Particle-Size Analysis and Determination of Soil Constants.

207 ASTM D422 - Standard Test Method for Particle-Size Analysis of Soils.

208 ASTM D429 - Standard Test Methods for Rubber Property—Adhesion to Rigid Substrates

209 ASTM D445 - Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity)

210 ASTM D471 - Standard Test Method for Rubber Property—Effect of Liquids

211 ASTM D543 - Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents

212 ASTM D546 - Standard Test method for Sieve Analysis of Mineral Filler for Road and Paving Materials.

213 ASTM D522 - Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings

214 ASTM D558 - Standard Test Methods for Moisture-Density Relations of Soil-Cement Mixtures.

215 ASTM D562 - Standard Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-Type Viscometer

216 ASTM D570 - Standard Test Method for Water Absorption of Plastics.

217 ASTM D573 - Standard Test Method for Rubber—Deterioration in an Air Oven

218 ASTM D618 - Standard Practice for Conditioning Plastics for Testing

219 ASTM D624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers

220 ASTM D638 - Standard Test Method for Tensile Properties of Plastics (Metric).

221 ASTM D695 - Standard Test Method for Compressive Properties of Rigid Plastics

222 ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m3)

223 ASTM D711 - Standard Test Method for No-Pick-Up Time of Traffic Paint

224 ASTM D714 - Standard Test Method for Evaluating Degree of Blistering of Paints

225 ASTM D727 - Standard Test Method for Kerosine Number of Roofing and Flooring Felt by the Vacuum Method

226 ASTM D746 - Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact

227 ASTM D751 - Standard Test Methods for Coated Fabrics

228 ASTM D785 - Standard Test Method for Rockwell Hardness of Plastics and Electrical Insulating Materials

229 ASTM D792 - Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement

230 ASTM D814 - Standard Test Method for Rubber Property- Vapor Transmission of Volatile Liquids

231 ASTM D816 - 06 Standard Test Methods for Rubber Cements

232 ASTM D822 - Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings

233 ASTM D854 - Standard Test Methods for Specific Gravity of Soil Solids by Water Pycnometer

234 ASTM D869 - Standard Test Method for Evaluating Degree of Settling of Paint

235 ASTM D882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting

236 ASTM D903 - Standard Test Method for Peel or Stripping Strength of Adhesive Bonds

237 ASTM D946 - Standard Specification for Penetration-Graded Asphalt Cement for use in Pavement Construction.

238 ASTM D968 - Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive

239 ASTM D977 - Standard Specification for Emulsified Asphalt

240 ASTM D979 - Standard Practice for Sampling Bituminous Paving Mixtures

241 ASTM D1000 - Standard Test Methods for Pressure-Sensitive Adhesive-Coated Tapes Used for Electrical and Electronic Applications

242 ASTM D1004 - Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting

243 ASTM D1005 - Standard Test Method for Measurement of Dry-Film Thickness of Organic Coatings Using Micrometers

244 ASTM D1075 - Standard Test Method for Effect of Water on Compressive Strength of Compacted Bituminous Mixtures

245 ASTM D1140 - Standard Test Methods for Amount of Material in Soils Finer than No. 200 (75-µm) Sieve

246 ASTM D1143 - Standard Test Methods for Deep Foundations Under Static Axial Compressive Load

247 ASTM D1188 - Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples

248 ASTM D1196 - Standard Test Method for Non-repetitive Static Plate Load Tests of Soils and Flexible Pavement Components, for Use in Evaluation and Design of Airport and Highway Pavements

249 ASTM D1199 - Standard Specification for Calcium Carbonate Pigments

250 ASTM D1204 - Standard Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated temperatures.

251 ASTM D1210 - Standard Test Method for Fineness of Dispersion of Pigment-Vehicle Systems by Hegman-Type Gage

252 ASTM D1212 - Standard Test Methods for Measurement of Wet Film Thickness of Organic Coatings

253 ASTM D1214 - Standard Test Method for Sieve Analysis of Glass Spheres

254 ASTM D1309 - Standard Test Method for Settling Properties of Traffic Paints During Accelerated Storage.

255 ASTM D1415 - Standard Test Method for Rubber Property-International Hardness

256 ASTM D1461 - Standard Test Method for Moisture or Volatile Distillates in Bituminous Paving Mixtures

257 ASTM D1475 - Standard Test Method For Density of Liquid Coatings, Inks, and Related Products

258 ASTM D1505 - Standard Test Method for Density of Plastics by the Density-Gradient Technique

259 ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.

260 ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.

261 ASTM D1586 - Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel

262 ASTM D1587 - Standard Practice for Thin-Walled Tube Sampling of Soils for Geotechnical

263 ASTM D1599 - Standard Test Method for Resistance to Short-Time Hydraulic Pressure of Plastic Pipe, Tubing, and Fittings

264 ASTM D1632 - Standard Practice for Making and Curing Soil-Cement Compression and Flexure Test Specimens in the Laboratory.

265 ASTM D1633 - Standard Test Method for Compressive Strength of Moulded Soil-Cement Cylinders.

266 ASTM D1635 - Standard Test Method for Flexural Strength of Soil-Cement Using Simple Beam with Third-Point Loading.

267 ASTM D1640 - Standard Test Methods for Drying, Curing, or Film Formation of Organic Coatings at Room Temperature

268 ASTM D1644 - Standard Test Methods for Nonvolatile Content of Varnishes.

269 ASTM D1653 - Standard Test Methods for Water Vapor Transmission of Organic Coating Films

270 ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)

271 ASTM D1754 - Standard Test Method for Effect of Heat and Air on Asphaltic Materials (Thin-Film Oven Test).

272 ASTM D1876 - Standard Test Method for Peel Resistance of Adhesives (T-Peel Test)

273 ASTM D1883 - Standard Test Method for CBR (California Bearing Ratio) of Laboratory-Compacted Soils

274 ASTM D1922 - Test Method for Propagation Tear Resistance of Plastic Film and Thin Sheeting by Pendulum Method

275 ASTM D2026 - Standard Specification for Cutback Asphalt (Slow-Curing Type).

276 ASTM D2027 - Standard Specification for Cutback Asphalt (Medium-Curing Type).

277 ASTM D2028 - Standard Specification for Cutback Asphalt (Rapid-Curing Type)

278 ASTM D2041 - Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures

279 ASTM D2042 - Standard Test Method for Solubility of Asphalt Materials on Trichloroethylene.

280 ASTM D2047 - Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine

281 ASTM D2122 - Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings

282 ASTM D2136 - Standard Test Method for Coated Fabrics-Low-Temperature Bend Test

283 ASTM D2166 - Standard Test Method for Unconfined Compressive Strength of Cohesive Soil

284 ASTM D2170 - Standard Test Method for Kinematic Viscosity of Asphalts (Bitumins).

285 ASTM D2171 - Standard Test Method for Viscosity of Asphalts by Vacuum Capillary Viscometer

286 ASTM D2172 - Standard Test Methods for Quantitative Extraction of Bitumen from Bituminous Paving Mixtures.

287 ASTM D2196 - Standard Test Methods for Rheological Properties of Non-Newtonian Materials by Rotational (Brookfield type) Viscometer

288 ASTM D2216 - Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock.

289 ASTM D2240 - Standard Test Method for Rubber Property - Durometer Hardness

290 ASTM D2290 - Standard Test Method for Apparent Hoop Tensile Strength of Plastic or Reinforced Plastic Pipe by Split Disk Method

291 ASTM D2369 - Standard Test Method for Volatile Content of Coatings

292 ASTM D2370 - Test Method for Tensile Properties of Organic Coatings

293 ASTM D2394 - Standard Test Methods for Simulated Service Testing of Wood and Wood-Base Finish Flooring

294 ASTM D2397 - Standard Specification for Cationic Emulsified Asphalt

295 ASTM D2412 - Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate L

296 ASTM D2419 - Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.

297 ASTM D2435 - Standard Test Methods for One-Dimensional Consolidation Properties of Soils Using Incremental Loading.

298 ASTM D2486 - Standard Test Methods for Scrub Resistance of Wall Paints

299 ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).

300 ASTM D2489 - Standard Practice for Estimating Degree of Particle Coating of Bituminous-Aggregate Mixtures

301 ASTM D2523 - Standard Practice for Testing Load-Strain Properties of Roofing Membranes

302 ASTM D2563 - Standard Practice for Classifying Visual Defects in Glass-Reinforced Plastic Laminate Parts

303 ASTM D2582 - Standard Test Method for Puncture-Propagation Tear Resistance of Plastic Film and Thin Sheeting

304 ASTM D2583 - Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor

305 ASTM D2584 - Standard Test Method for Ignition Loss of Cured Reinforced Resins

306 ASTM D2726 - Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures

307 ASTM D2794 - Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)

308 ASTM D2829 - Standard Practice for Sampling and Analysis of Existing Built-Up Roof Systems

309 ASTM D2872 - Standard Test Method for Effect of Heat and Air on a Moving Film of Asphalt (Rolling Thin-Film Oven Test)

310 ASTM D2939 - Standard Test Methods for Emulsified Bitumens Used as Protective Coatings

311 ASTM D2940 - Standard Specification for Graded Aggregate Material For Bases or Subbases for Highways or Airports

312 ASTM D2950 - Standard Test Method for Density of Bituminous Concrete In Place by Nuclear Methods.

313 ASTM D2974 - Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils.

314 ASTM D2995 - Standard Practice for Estimating Application Rate of Bituminous Distributors

315 ASTM D3045 - Standard Practice for Heat Aging of Plastics Without Load

316 ASTM D3080 - Standard Test Method for Direct Shear Test of Soils Under Consolidated Drained Conditions

317 ASTM D3203 -Standard Test Method for Per Cent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures.

318 ASTM D3205 - Test Method for Viscosity of Asphalt with Cone and Plate Viscometer

319 ASTM D3143 - Standard Test Method for Flash Point of Cutback Asphalt with Tag Open-Cup Apparatus.

320 ASTM D3183 - Standard Practice for Rubber—Preparation of Pieces for Test Purposes from Products

321 ASTM D3359 - Standard Test Methods for Measuring Adhesion by Tape Test

322 ASTM D3381 - Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction

323 ASTM D3282 - Standard Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes.

324 ASTM D3387 - Standard Test Method for Compaction and Shear Properties of Bituminous Mixtures by Means of the U.S. Corps of Engineers Gyratory Testing Machine (GTM)

325 ASTM D3398 - Standard Test Method for Index of Aggregate Particle Shape and Texture.

326 ASTM D3441 - Standard Test Method for Mechanical Cone Penetration Tests of Soil.

327 ASTM D3549 - Standard Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens

328 ASTM D3567 - Standard Practice for Determining Dimensions of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting Resin) Pipe and Fittings

329 ASTM D3617 - Standard Practice for Sampling and Analysis of Built-Up Roof Systems During Application

330 ASTM D3665 - Standard Practice for Random Sampling of Construction Materials

331 ASTM D3666 - Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials

332 ASTM D3689 - Standard Test Methods for Deep Foundations Under Static Axial Tensile Load

333 ASTM D3723 - Standard Test Method for Pigment Content of Water-Emulsion Paints by Low-Temperature Ashing

334 ASTM D3746 - Standard Test Method for Impact Resistance of Bituminous Roofing Systems

335 ASTM D3767 - Standard Practice for Rubber—Measurement of Dimensions

336 ASTM D3787 - Standard Test Method for Bursting Strength of Textiles-Constant-Rate-of-Traverse (CRT) Ball Burst Test

337 ASTM D3966 - Standard Test Methods for Deep Foundations Under Lateral Load

338 ASTM D4060 - Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser

339 ASTM D4073 - Standard Test Method for Tensile-Tear Strength of Bituminous Roofing Membranes

340 ASTM D4125 - Standard Test Methods for Asphalt Content of Bituminous Mixtures by the Nuclear Method

341 ASTM D4138 - Standard Practices for Measurement of Dry Film Thickness of Protective Coating Systems by Destructive, Cross-Sectioning Means

342 ASTM D4218 - Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds By the Muffle-Furnace Technique

343 ASTM D4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

344 ASTM D4354 - Standard Practice for Sampling of Geosynthetics for Testing

345 ASTM D4373 - Standard Test Method for Rapid Determination of Carbonate Content of Soils

346 ASTM D4380 - Standard Test Method for Density of Bentonitic Slurries

347 ASTM D4381 - Standard Test Method for Sand Content by Volume of Bentonitic Slurries

348 ASTM D4400 - Standard Test Method for Sag Resistance of Paints Using a Multinotch Applicator

349 ASTM D4402 - Standard Test Method for Viscosity Determination of Asphalt at Elevated Temperatures Using a Rotational Viscometer

350 ASTM D4428 - Standard Test Methods for Crosshole Seismic Testing

351 ASTM D4429 - Standard Test Method for CBR (California Bearing Ratio) of Soils in Place

352 ASTM D4437 - Standard Practice for Non-destructive Testing (NDT) for Determining the Integrity of Seams Used in Joining Flexible Polymeric Sheet Geomembranes

353 ASTM D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity.

354 ASTM D4533 - Standard Test Method for Trapezoid Tearing Strength of Geotextiles

355 ASTM D4541 - Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers

356 ASTM D4543 - Standard Practices for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerances

357 ASTM D4561 - Standard Practice for Quality Control Systems for Organizations Producing and Applying Bituminous Paving Materials

358 ASTM D4587 - Standard Practice for Fluorescent UV-Condensation Exposures of Paint and Related Coatings

359 ASTM D4595 - Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method

360 ASTM D4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles

361 ASTM D4643 - Standard Test Method for Determination of Water (Moisture) Content of Soil by Microwave Oven Heating

362 ASTM D4694 - Standard Test Method for Deflections with a Falling-Weight-Type Impulse Load Device

363 ASTM D4695 - Standard Guide for General Pavement Deflection Measurements

364 ASTM D4718 - Standard Practice for Correction of Unit Weight and Water Content for Soils Containing Oversize Particles

365 ASTM D4787 - Standard Practice for Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates

366 ASTM D4791 - Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate

367 ASTM D4792 - Standard Test Method for Potential Expansion of Aggregates from Hydration Reactions

368 ASTM D4796 - Standard Test Method for Bond Strength of Thermoplastic Traffic Marking Materials

369 ASTM D4798 - Standard Practice for Accelerated Weathering Test Conditions and Procedures for Bituminous Materials (Xenon-Arc Method)

370 ASTM D4799 - Standard Practice for Accelerated Weathering Test Conditions and Procedures for Bituminous Materials (Fluorescent UV, Water Spray, and Condensation Method)

371 ASTM D4832 - Standard Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders

372 ASTM D4867 - Standard Test Method for Effect of Moisture on Asphalt Concrete Paving Mixtures.

373 ASTM D4830 - Standard Test Methods for Characterizing Thermoplastic Fabrics Used in Roofing and Waterproofing

374 ASTM D4833 - Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products

375 ASTM D4885 - Standard Test Method for Determining Performance Strength of Geomembranes by the Wide Strip Tensile Method

376 ASTM D4932 - Standard Test Method for Fastener Rupture and Tear Resistance of Roofing and Waterproofing Sheets, Roll Roofing, and Shingles

377 ASTM D4945 - Standard Test Method for High-Strain Dynamic Testing of Piles

378 ASTM D4959 - Standard Test Method for Determination of Water (Moisture) Content of Soil By Direct Heating

379 ASTM D4989 - Standard Test Method for Apparent Viscosity (Flow) of Roofing Bitumens Using the Parallel Plate Plastometer

380 ASTM D5034 - Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Strength).

381 ASTM D5035 - Standard Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Method)

382 ASTM D5076 - Standard Test Method for Measuring Voids in Roofing and Waterproofing Membranes

383 ASTM D5084 - Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

384 ASTM D5095 - Standard Test Method for Determination of the Nonvolatile Content in Silanes, Siloxanes and Silane-Siloxane Blends Used in Masonry Water Repellent Treatments

385 ASTM D5147 - Standard Test Methods for Sampling and Testing Modified Bituminous Sheet Material

386 ASTM D5162 - Standard Practice for Discontinuity (Holiday) Testing of Nonconductive Protective Coating on Metallic Substrates

387 ASTM D5199 - Standard Test Method for Measuring Nominal Thickness of Geotextiles and Geomembranes.

388 ASTM D5215 - Standard Test Method for Instrumental Evaluation of Staining of Vinyl Flooring by Adhesives

389 ASTM D5261 - Standard Test Method for Measuring Mass per Unit Area of Geotextiles.

390 ASTM D5329 - Standard Test Methods for Sealants and Fillers, Hot-Applied, for Joints and Cracks in Asphaltic and Portland Cement Concrete Pavements

391 ASTM D5385 - Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes

392 ASTM D5401 - Standard Test Method for Evaluating Clear Water Repellent Coatings on Wood

393 ASTM D5444 - Standard Test Method for Mechanical Size Analysis of Extracted Aggregate

394 ASTM D5581 - Standard Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus (6 inch-Diameter Specimen)

395 ASTM D5596 - Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics

396 ASTM D5602 - Standard Test Method for Static Puncture Resistance of Roofing Membrane Specimens

397 ASTM D5635 - Standard Test Method for Dynamic Puncture Resistance of Roofing Membrane Specimens

398 ASTM D5636 - Standard Test Method for Low Temperature Unrolling of Felt or Sheet Roofing and Waterproofing Materials

399 ASTM D5641 - Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber

400 ASTM D5683 - Standard Test Method for Flexibility of Roofing and Waterproofing Materials and Membranes

401 ASTM D5731 - Standard Test Method for Determination of the Point Load Strength Index of Rock and Application to Rock Strength Classifications

402 ASTM D5778 - Standard Test Method for Electronic Friction Cone and Piezocone Penetration Testing of Soils

403 ASTM D5820 - Standard Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes

404 ASTM D5821 - Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate.

405 ASTM D5849 - Standard Test Method for Evaluating Resistance of Modified Bituminous Roofing Membrane to Cyclic Fatigue (Joint Displacement)

406 ASTM D5858 - Standard Guide for Calculating In Situ Equivalent Elastic Moduli of Pavement Materials Using Layered Elastic Theory

407 ASTM D5882 - Standard Test Method for Low Strain Impact Integrity Testing of Deep Foundations.

408 ASTM D5890 - Standard Test Method for Swell Index of Clay Mineral Component of Geosynthetic Clay Liners

409 ASTM D5957 - Standard Guide for Flood Testing Horizontal Waterproofing Installations

410 ASTM D5993 - Standard Test Method for Measuring Mass Per Unit of Geosynthetic Clay Liners

411 ASTM D5994 - Standard Test Method for Measuring Core Thickness of Textured Geomembrane

412 ASTM D6084 - Standard Test Method for Elastic Recovery of Bituminous Materials by Ductilometer

413 ASTM D6087 - Standard Test Method for Evaluating Asphalt-Covered Concrete Bridge Decks Using Ground Penetrating Radar

414 ASTM D6132 - Standard Test Method for Nondestructive Measurement of Dry Film Thickness of Applied Organic Coatings Using an Ultrasonic Gage

415 ASTM D6167 - Standard Guide for Conducting Borehole Geophysical Logging: Mechanical Caliper

416 ASTM D6241 - Test Method for the Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe

417 ASTM D6294 - Standard Test Method for Corrosion Resistance of Ferrous Metal Fastener Assemblies Used in Roofing and Waterproofing

418 ASTM D6307 - Standard Test Method for Asphalt Content of Hot-Mix Asphalt by Ignition Method.

419 ASTM D6365 - Standard Practice for the Nondestructive Testing of Geomembrane Seams using the Spark Test

420 ASTM D6392 - Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods

421 ASTM D6432 - Standard Guide for Using the Surface Ground Penetrating Radar Method for Subsurface Investigation

422 ASTM D6496 - Standard Test Method for Determining Average Bonding Peel Strength Between the Top and Bottom Layers of Needle-Punched Geosynthetic Clay Liners

423 ASTM D6521 - Standard Practice for Accelerated Aging of Asphalt Binder Using a Pressurized Aging Vessel (PAV)

424 ASTM D6627 - Standard Test Method for Determination of a Volatile Distillate Fraction of Cold Asphalt Mixtures

425 ASTM D6693 - Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes

426 ASTM D6760 - Standard Test Method for Integrity Testing of Concrete Deep Foundations by Ultrasonic Crosshole Testing

427 ASTM D6925 - Standard Test Method for Preparation and Determination of the Relative Density of Hot Mix Asphalt (HMA) Specimens by Means of the Superpave Gyratory Compactor

428 ASTM D6926 - Standard Practice for Preparation of Bituminous Specimens Using Marshall Apparatus

429 ASTM D6927 - Standard Test Method for Marshall Stability and Flow of Bituminous Mixtures

430 ASTM D6928 - Standard Test Method for Resistance of Coarse Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus

431 ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

432 ASTM D7006 - Practice for Ultrasonic Testing of Geomembranes

433 ASTM D7012 - Standard Test Method for Compressive Strength and Elastic Moduli of Intact Rock Core Specimens under Varying States of Stress and Temperatures

434 ASTM D7091 - Standard Practice for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to Ferrous Metals and Nonmagnetic, Nonconductive Coatings Applied to Non-Ferrous Metals

435 ASTM D7105 - Standard Test Method for Determining the Adhesive and Cohesive Strength Between Materials in Roofing or Waterproofing Membranes and Systems

436 ASTM D7175 - Standard Test Method for Determining the Rheological Properties of Asphalt Binder Using a Dynamic Shear Rheometer

437 ASTM D7234 - Standard Test Method for Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers

438 ASTM D7281 - Standard Test Method for Determining Water Migration Resistance Through Roof Membranes

439 ASTM D7307 - Standard Practice for Sampling of Thermoplastic Traffic Marking Materials

440 ASTM D7308 - Standard Practice for Sample Preparation of Thermoplastic Traffic Marking Materials

441 ASTM D7349 - Standard Test Method for Determining the Capability of Roofing and Waterproofing Materials to Seal around Fasteners

442 ASTM D7383 - Standard Test Methods for Axial Compressive Force Pulse (Rapid) Testing of Deep Foundations

443 ASTM D7379 - Standard Test Methods for Strength of Modified Bitumen Sheet Material Laps Using Cold Process Adhesive

444 ASTM D7428 - Standard Test Method for Resistance of Fine Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus

445 ASTM D7635 - Standard Test Method for Measurement of Thickness of Coatings Over Fabric Reinforcement

446 ASTM D7636 - Standard Practice for Sampling and Analysis of Modified Bitumen Roof Systems

447 ASTM D7681 - Standard Test Method for Measuring Gradation of Glass Spheres Using a Flowing Stream Digital Image Analyzer

448 ASTM E8 - Test Methods for Tension Testing of Metallic Materials

449 ASTM E9 - Standard Test Methods of Compression Testing of Metallic Materials at Room Temperature

450 ASTM E10 - Test Method for Brinell Hardness of Metallic Materials

451 ASTM E18 - Test Methods for Rockwell Hardness of Metallic Materials

452 ASTM E23 - Standard Test Methods for Notched Bar Impact Testing of Metallic Materials

453 ASTM E30 - Test Methods for Chemical Analysis of Steel, Cast Iron, Open-Hearth Iron, and Wrought Iron

454 ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials

455 ASTM E102 - Test Method for Saybolt Furol Viscosity of Bituminous Materials at High Temperatures

456 ASTM E110 - Test Method for Indentation Hardness of Metallic Materials by Portable Hardness Testers

457 ASTM E154 - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover

458 ASTM E165 - Standard Practice for Liquid Penetrant Examination for General Industry

459 ASTM E190 - Test Method for Guided Bend Test for Ductility of Welds

460 ASTM E213 - Standard Practice for Ultrasonic Testing of Metal Pipe and Tubing

461 ASTM E290 - Test Methods for Bend Testing of Material for Ductility

462 ASTM E303 - Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester.

463 ASTM E328 - Standard Test Method for Relaxation Tests for Materials and Structures.

464 ASTM E350 - Standard Test Methods for Chemical Analysis of Carbon Steel, Low-Alloy Steel, Silicon Electrical Steel, Ingot Iron, and Wrought Iron

465 ASTM E351 - Standard Test Methods for Chemical Analysis of Cast Iron-All Types

466 ASTM E376 - Standard Practice for Measuring Coating Thickness by Magnetic-Field or Eddy-Current (Electromagnetic) Examination Methods

467 ASTM E514 - Standard Test Method for Water Penetration and Leakage Through Masonry

468 ASTM E518 - Standard Test Methods for Flexural Bond Strength of Masonry

469 ASTM E810 - Standard Test Method for Coefficient of Retroreflection of Retroreflective Sheeting Utilizing the Coplanar Geometry

470 ASTM E812 - Test Method for Crack Strength of Slow-Bend Precracked Charpy Specimens of High-Strength Metallic Materials

471 ASTM E907 - Standard Test Method for Field Testing Uplift Resistance of Adhered Membrane Roofing Systems

472 ASTM E950 - Standard Test Method for Measuring the Longitudinal Profile of Travelled Surfaces with an Accelerometer Established Inertial Profiling Reference

473 ASTM E1002 - Standard Practice for Leaks Using Ultrasonics

474 ASTM E1003 - Standard Test Method for Hydrostatic Leak Testing

475 ASTM E1170 - Standard Practices for Simulating Vehicular Response to Longitudinal Profiles of Traveled Surfaces

476 ASTM E1347 - Standard Test Method for Color and Color-Difference Measurement by Tristimulus (Filter) Colorimetry.

477 ASTM E1444 - Standard Practice for Magnetic Particle Testing

478 ASTM E1709 - Standard Test Method for Measurement of Retroreflective Signs Using a Portable Retroreflectometer at a 0.2 Degree Observation Angle

479 ASTM E1926 - Standard Practice for Computing International Roughness Index of Roads from Longitudinal Profile Measurements

480 ASTM E2340 - Standard Test Method for Measuring the Skid Resistance of Pavements and Other Trafficked Surfaces Using a Continuous Reading, Fixed-Slip Technique

481 ASTM E2540 - Standard Test Method for Measurement of Retroreflective Signs Using a Portable Retroreflectometer at a 0.5 Degree Observation Angle

482 ASTM E2583 - 07 Standard Test Method for Measuring Deflections with a Light Weight Deflectometer (LWD)

483 ASTM F137 - Standard Test Method for Flexibility of Resilient Flooring Materials with Cylindrical Mandrel Apparatus

484 ASTM F150 - Standard Test Method for Electrical Resistance of Conductive and Static Dissipative Resilient Flooring

485 ASTM F386 - Standard Test Method for Thickness of Resilient Flooring Materials Having Flat Surfaces

486 ASTM F925 - Standard Test Method for Resistance to Chemicals of Resilient Flooring

487 ASTM F1514 - Standard Test Method for Measuring Heat Stability of Resilient Flooring by Color Change

488 ASTM F1515 - Standard Test Method for Measuring Light Stability of Resilient Flooring by Color Change

489 ASTM F2048 - Standard Practice for Reporting Slip Resistance Test Results

490 ASTM G6 - Standard Test Method for Abrasion Resistance of Pipeline Coatings

491 ASTM G12 - Standard Test Method for Nondestructive Measurement of Film Thickness of Pipeline Coatings on Steel

492 ASTM G57 - Standard Test Method for Field Measurement of Soil Resistivity Using the Wenner Four-Electrode Method

493 ASTM G62 - Test Methods for Holiday Detection in Pipeline Coatings

494 ASTM G90 - Standard Practice for Performing Accelerated Outdoor Weathering of Nonmetallic Materials Using Concentrated Natural Sunlight

495 ASTM G109 - Standard Test Method for Determining Effects of Chemical Admixtures on Corrosion of Embedded Steel Reinforcement in Concrete Exposed to Chloride Environments

496 ASTM G154 - Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials

15.46.7 American Welding Society (AWS):

1 AWS D1.1 - Structural Welding Code - Steel

2 AWS D1.4 - Structural Welding Code - Reinforcing Steel (Where to use this code, especially in precast?)

15.46.8 British Standards Institute (BSI):

1 BS 65 - Specification for vitrified clay pipes, fittings and ducts, also flexible mechanical joints for use solely with surface water pipes and fittings

2 BS 434-1 - Bitumen road emulsions. Specification for anionic bitumen road emulsions

3 BS 476 - Fire tests on building materials and structures

4 BS 598-1 - Sampling and examination of bituminous mixtures for roads and other paved areas. Methods for the measurement of the rate of spread of coated chippings and the temperature of bituminous mixtures using non-contact temperature-measuring devices and for the assessment of the compaction performance of a roller

5 BS 598-110 - Sampling and examination of bituminous mixtures for roads and other paved areas. Methods of test for the determination of wheel-tracking rate and depth

6 BS 812-105.1 - Testing aggregates. Methods for determination of particle shape. Flakiness index

7 BS 812-105.2 - Testing aggregates. Methods for determination of particle shape. Elongation index of coarse aggregate

8 BS 812-109 - Testing aggregates. Methods for determination of moisture content

9 BS 812-110 - Testing aggregates. Methods for determination of aggregate crushing value (ACV)

10 BS 812-111 - Testing aggregates. Methods for determination of ten per cent fines value (TFV)

11 BS 812-112 - Testing aggregates. Method for determination of aggregate impact value (AIV)

12 BS 812-117 - Testing aggregates. Method for determination of water-soluble chloride salts

13 BS 812-118 - Testing aggregates. Methods for determination of sulphate content

14 BS 812-121 - Testing aggregates. Method for determination of soundness

15 BS 812-124 - Testing aggregates. Method for determination of frost heave

16 BS 1344-11, ISO 2746 - Methods of testing vitreous enamel finishes. High voltage test for enamelled articles for service under highly corrosive conditions

17 BS 1377-1 - Methods of test for soils for civil engineering purposes. General requirements and sample preparation

18 BS 1377-2 - Methods of test for soils for civil engineering purposes. Classification tests

19 BS 1377-3 - Methods of test for soils for civil engineering purposes. Chemical and electro-chemical tests

20 BS 1377-4 - Methods of test for soils for civil engineering purposes. Compaction-related tests

21 BS 1377-5 - Methods of test for soils for civil engineering purposes. Compressibility, permeability and durability tests

22 BS 1377-7 - Methods of test for soils for civil engineering purposes. Shear strength tests (total stress)

23 BS 1377-9 - Methods of test for soils for civil engineering purposes. In-situ tests

24 BS 1881-121 - Testing concrete. Method for determination of static modulus of elasticity in compression

25 BS 1881-122 - Testing concrete. Method for determination of water absorption

26 BS 1881-124 - Testing concrete. Methods for analysis of hardened concrete

27 BS 1881-125 - Testing concrete. Methods for mixing and sampling fresh concrete in the laboratory

28 BS 1881-201 - Testing concrete. Guide to the use of non-destructive methods of test for hardened concrete

29 BS 1881-204 - Testing concrete. Recommendations on the use of electromagnetic covermeters

30 BS 1881-206 - Testing concrete. Recommendations for determination of strain in concrete

31 BS 1881-208 - Testing concrete. Recommendations for the determination of the initial surface absorption of concrete

32 BS 2499-3 - Hot-applied joint sealant systems for concrete pavements. Methods of test

33 BS 2782-0 - Methods of testing plastic. Introduction

34 BS 3262-3 - Hot-applied thermoplastic road marking materials. Specification for application of material to road surfaces

35 BS 3505 - Specification for unplasticized polyvinyl chloride (PVC-U) pressure pipes for cold potable water

36 BS 3900-D9, ISO 7724-2 - Methods of test for paints. Optical tests on paint films. Determination of colour and colour difference: measurement

37 BS 3987 - Specification for anodic oxidation coatings on wrought aluminium for external architectural applications

38 BS 4027 - Specification for sulfate-resisting Portland cement

39 BS 4050-2 - Specification for mosaic parquet panels. Classification and quality requirements

40 BS 4051, ISO 1765 - Method for determination of thickness of textile floor coverings

41 BS 4098 - Method for the determination of thickness, compression and recovery characteristics of textile floor coverings

42 BS 4449 - Steel for the reinforcement of concrete. Weldable reinforcing steel. Bar, coil and decoiled product. Specification

43 BS 4482 - Steel wire for the reinforcement of concrete products. Specification

44 BS 4483 - Steel fabric for the reinforcement of concrete. Specification

45 BS 4550-3.8 - Methods of testing cement. Physical tests. Test for heat of hydration

46 BS 4551 - Mortar. Methods of test for mortar. Chemical analysis and physical testing

47 BS 4592-0 - Industrial type flooring and stair treads. Common design requirements and recommendations for installation

48 BS 4660 - Thermoplastics ancillary fittings of nominal sizes 110 and 160 for below ground gravity drainage and sewerage

49 BS 4682-2 - Methods of test for dimensional stability of textile floor coverings. Determination of dimensional changes due to changes in ambient humidity

50 BS 4682-3 - Methods of test for dimensional stability of textile floor coverings. Determination of dimensional changes after exposure to heat

51 BS 4682-4 - Methods of test for dimensional stability of textile floor coverings. Determination of dimensional changes after immersion in water

52 BS 4790 - Method for determination of the effects of a small source of ignition on textile floor coverings (hot metal nut method)

53 BS 4805 - Method for determination of the dimensions of rectangular textile floor coverings

54 BS 4873 - Aluminium alloy windows and doorsets. Specification

55 BS 4939, ISO 3416 - Method for determination of thickness loss of textile floor coverings after prolonged heavy static loading

56 BS 4965 - Decorative laminated plastics sheet veneered boards and panels

57 BS 5212-3 - Cold applied joint sealant systems for concrete pavements. Methods of test

58 BS 5385-1 - Wall and floor tiling. Design and installation of ceramic, natural stone and mosaic wall tiling in normal internal conditions. Code of practice

59 BS 5385-2 - Wall and floor tiling. Design and installation of external ceramic and mosaic wall tiling in normal conditions. Code of practice

60 BS 5385-3 - Wall and floor tiling. Design and installation of internal and external ceramic floor tiles and mosaics in normal conditions. Code of practice

61 BS 5385-4 - Wall and floor tiling. Design and installation of ceramic and mosaic tiling in special conditions. Code of practice

62 BS 5385-5 - Wall and floor tiling. Design and installation of terazzo, natural stone and agglomerated stone tile and slab flooring. Code of practice

63 BS 5896 - Specification for high tensile steel wire and strand for the prestressing of concrete

64 BS 5911-1 - Concrete pipes and ancillary concrete products. Specification for unreinforced and reinforced concrete pipes (including jacking pipes) and fittings with flexible joints (complementary to EN1916)

65 BS 5911-3 - Concrete pipes and ancillary concrete products. Specification for unreinforced and reinforced concrete manholes and soakaways (complementary to EN1917)

66 BS 5911-4 - Concrete pipes and ancillary concrete products. Specification for unreinforced and reinforced concrete inspection chambers (complementary to EN1917)

67 BS 5911-6 - Concrete pipes and ancillary concrete products. Specification for road gullies and gully cover slabs

68 BS 5921 - Methods for determination of size, squareness and straightness of edge of textile floor covering tiles

69 BS 5930 - Code of practice for site investigations

70 BS 6001-1, ISO 2859-1 - Sampling procedures for inspection by attributes. Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection

71 BS 6073-2 - Precast concrete masonry units. Guide for specifying precast concrete masonry units

72 BS 6076 - Specification for polymeric film for use as a protective sleeving for buried iron pipes and fittings (for site and factory application)

73 BS 6319-1 - Testing of resin and polymer/cement compositions for use in construction. Method for preparation of test specimens

74 BS 6319-2 - Testing of resin and polymer/cement compositions for use in construction. Method for measurement of compressive strength

75 BS 6319-3 - Testing of resin and polymer/cement compositions for use in construction. Methods for measurement of modulus of elasticity in flexure and flexural strength

76 BS 6319-5 - Testing of resin and polymer/cement compositions for use in construction. Methods for determination of density of hardened resin compositions

77 BS 6319-6 - Testing of resin and polymer/cement compositions for use in construction. Method for determination of modulus of elasticity in compression

78 BS 6319-7 - Testing of resin and polymer/cement compositions for use in construction. Method for measurement of tensile strength

79 BS 6319-8 - Testing of resin and polymer/cement compositions for use in construction. Method for the assessment of resistance to liquids

80 BS 6319-9 - Testing of resin and polymer/cement compositions for use in construction. Method for measurement and classification of peak exotherm temperature

81 BS 6319-10 - Testing of resin and polymer/cement compositions for use in construction. Method for measurement of temperature of deflection under a bending stress

82 BS 6319-11 - Testing of resin and polymer/cement compositions for use in construction. Methods for determination of creep in compression and in tension

83 BS 6496 - Specification for powder organic coatings for application and stoving to aluminium alloy extrusions, sheet and preformed sections for external architectural purposes, and for the finish on aluminium alloy extrusions, sheet and preformed sections coated with powder organic coatings

84 BS 6744 - Stainless steel bars for the reinforcement of and use in concrete. Requirements and test methods

85 BS 7044-1 - Artificial sports surfaces. Classification and general introduction

86 BS 7078 - Method for determination of the electrical resistance to earth of an installed textile floor covering

87 BS 7188 - Impact absorbing playground surfacing. Performance requirements and test methods

88 BS 7542 - Method of test for curing compounds for concrete

89 BS 7941-1 - Methods for measuring the skid resistance of pavement surfaces. Sideway-force coefficient routine investigation machine

90 BS 7941-2 - Methods for measuring the skid resistance of pavement surfaces. Test method for measurement of surface skid resistance using the GripTester braked wheel fixed slip device

91 BS 8102 - Code of practice for protection of below ground structures against water from the ground

92 BS 8420 - Methods of measuring irregularities on surfaces of roads, footways and other paved areas using straightedges and wedges

93 BS 8442 - Miscellaneous road traffic signs and devices. Requirements and test methods

94 BS 8443 - Specification for establishing the suitability of special purpose concrete admixtures

95 BS 8500-1 - Concrete. Complementary British Standard to EN206-1. Method of specifying and guidance for the specifier

96 BS 8500-2 - Concrete. Complementary British Standard to EN206-1. Specification for constituent materials and concrete

97 EN58, BS 2000-474 - Bitumen and bituminous binders. Sampling bituminous binders

98 EN124 - Gully tops and manhole tops for vehicular and pedestrian areas. Design requirements, type testing, marking, quality control

99 EN196-1 - Methods of testing cement. Determination of strength

100 EN196-2 - Methods of testing cement. Chemical analysis of cement

101 EN196-3 - Methods of testing cement. Determination of setting time and soundness

102 EN196-5 - Methods of testing cement. Pozzolanicity test for pozzolanic cement

103 EN196-6 - Methods of testing cement. Determination of fineness

104 EN196-7 - Methods of testing cement. Methods of taking and preparing samples of cement

105 EN197-1 - Cement. Composition, specifications and conformity criteria for low heat common cements

106 EN206-1 - Concrete. Specification, performance, production and conformity

107 EN295-1 - Vitrified clay pipes and fittings and pipe joints for drains and sewers. Requirements

108 EN295-2 - Vitrified clay pipes and fittings and pipe joints for drains and sewers. Quality control and sampling

109 EN295-3 - Vitrified clay pipes and fittings and pipe joints for drains and sewers. Test methods

110 EN295-4 - Vitrified clay pipes and fittings and pipe joints for drains and sewers. Requirements for special fittings, adaptors and compatible accessories

111 EN295-5 - Vitrified clay pipes and fittings and pipe joints for drains and sewers. Requirements for perforated vitrified clay pipes and fittings

112 EN295-6 - Vitrified clay pipes and fittings and pipe joints for drains and sewers. Requirements for vitrified clay manholes

113 EN295-7 - Vitrified clay pipes and fittings and pipe joints for drains and sewers. Requirements for vitrified clay pipes and joints for pipe jacking

114 EN295-10 - Vitrified clay pipes and fittings and pipe joints for drains and sewers. Performance requirements

115 EN413-1 - Masonry cement. Composition, specifications and conformity criteria

116 EN413-2 - Masonry cement. Test methods

117 EN426 - Resilient floor coverings. Determination of width, length, straightness and flatness of sheet material

118 EN427 - Resilient floor coverings. Determination of the side length, squareness and straightness of tiles

119 EN428 - Resilient floor coverings. Determination of overall thickness

120 EN445 - Grout for prestressing tendons. Test methods

121 EN447 - Grout for prestressing tendons. Basic requirements

122 EN450-1 - Fly ash for concrete. Definition, specifications and conformity criteria

123 EN450-2 - Fly ash for concrete. Conformity evaluation

124 EN451-1 - Method of testing fly ash. Determination of free calcium oxide content

125 EN451-2 - Method of testing fly ash. Determination of fineness by wet sieving

126 EN480-1 - Admixtures for concrete, mortar and grout. Test methods. Reference concrete and reference mortar for testing

127 EN480-2 - Admixtures for concrete, mortar and grout. Test methods. Determination of setting time

128 EN480-4 - Admixtures for concrete, mortar and grout. Test methods. Determination of bleeding of concrete

129 EN480-5 - Admixtures for concrete, mortar and grout. Test methods. Determination of capillary absorption

130 EN480-6 - Admixtures for concrete, mortar and grout. Test methods. Infrared analysis

131 EN480-8 - Admixtures for concrete, mortar and grout. Test methods. Determination of the conventional dry material content

132 EN480-10 - Admixtures for concrete, mortar and grout. Test methods. Determination of water soluble chloride content

133 EN480-11 - Admixtures for concrete, mortar and grout. Test methods. Determination of air void characteristics in hardened concrete

134 EN480-12 - Admixtures for concrete, mortar and grout. Test methods. Determination of the alkali content of admixtures

135 EN480-13 - Admixtures for concrete, mortar and grout. Test methods. Reference masonry mortar for testing mortar admixtures

136 EN480-14 - Admixtures for concrete, mortar and grout. Test methods. Determination of the effect on corrosion susceptibility of reinforcing steel by potentiostatic electro-chemical test

137 EN485-1 - Aluminium and aluminium alloys. Sheet, strip and plate. Technical conditions for inspection and delivery

138 EN485-2 - Aluminium and aluminium alloys. Sheet, strip and plate. Mechanical properties

139 EN524-1 - Steel strip sheaths for prestressing tendons. Test methods. Determination of shape and dimensions

140 EN524-2 - Steel strip sheaths for prestressing tendons. Test methods. Determination of flexural behaviour

141 EN524-3 - Steel strip sheaths for prestressing tendons. Test methods. To-and-fro bending test

142 EN524-4 - Steel strip sheaths for prestressing tendons. Test methods. Determination of lateral load resistance

143 EN524-5 - Steel strip sheaths for prestressing tendons. Test methods. Determination of tensile load resistance

144 EN524-6 - Steel strip sheaths for prestressing tendons. Test methods. Determination of leaktightness (determination of water loss)

145 EN545 - Ductile iron pipes, fittings, accessories and their joints for water pipelines. Requirements and test methods

146 EN571-1 - Non-destructive testing. Penetrant testing. General principles

147 EN573-3 - Aluminium and aluminium alloys. Chemical composition and form of wrought products. Chemical composition and form of products

148 EN598 - Ductile iron pipes, fittings, accessories and their joints for sewerage applications. Requirements and test methods

149 EN639 - Common requirements for concrete pressure pipes including joints and fittings

150 EN640 - Reinforced concrete pressure pipes and distributed reinforcement concrete pressure pipes (non-cylinder type), including joints and fittings

151 EN641 - Reinforced concrete pressure pipes, cylinder type, including joints and fittings

152 EN642 - Prestressed concrete pressure pipes, cylinder and non-cylinder, including joints, fittings and specific requirement for prestressing steel for pipes

153 EN661 - Resilient floor coverings. Determination of the spreading of water

154 EN662 - Resilient floor coverings. Determination of curling on exposure to moisture

155 EN663 - Resilient floor coverings. Determination of conventional pattern depths

156 EN664 - Resilient floor coverings. Determination of volatile loss

157 EN665 - Resilient floor coverings. Determination of exudation of plasticizers

158 EN666 - Resilient floor coverings. Determination of gelling

159 EN669 - Resilient floor coverings. Determination of dimensional stability of linoleum tiles caused by changes in atmospheric humidity

160 EN670 - Resilient floor coverings. Identification of linoleum and determination of cement content and ash residue

161 EN672 - Resilient floor coverings. Determination of apparent density of agglomerated cork

162 EN684 - Resilient floor coverings. Determination of seam strength

163 EN685 - Resilient, textile and laminate floor coverings. Classification

164 EN718 - Resilient floor coverings. Determination of mass per unit area of a reinforcement or a backing of polyvinyl chloride floor coverings

165 EN755-2 - Aluminium and aluminium alloys. Extruded rod/bar, tube and profiles. Mechanical properties

166 EN755-3 - Aluminium and aluminium alloys. Extruded rod/bar, tube and profiles. Round bars, tolerances on dimensions and form

167 EN755-4 - Aluminium and aluminium alloys. Extruded rod/bar, tube and profiles. Square bars, tolerances on dimensions and form

168 EN755-6 - Aluminium and aluminium alloys. Extruded rod/bar, tube and profiles. Hexagonal bars, tolerances on dimensions and form

169 EN755-7 - Aluminium and aluminium alloys. Extruded rod/bar, tube and profiles. Seamless tubes, tolerances on dimensions and form

170 EN755-8 - Aluminium and aluminium alloys. Extruded rod/bar, tube and profiles. Porthole tubes, tolerances on dimensions and form

171 EN755-9 - Aluminium and aluminium alloys. Extruded rod/bar, tube and profiles. Profiles, tolerances on dimensions and form

172 EN771-1 - Specification for masonry units. Clay masonry units

173 EN771-2 - Specification for masonry units. Calcium silicate masonry units

174 EN771-3 - Specification for masonry units. Aggregate concrete masonry units (dense and light-weight aggregates)

175 EN771-4 - Specification for masonry units. Autoclaved aerated concrete masonry units

176 EN771-5 - Specification for masonry units. Manufactured stone masonry units

177 EN771-6 - Specification for masonry units. Natural stone masonry units

178 EN772-1 - Methods of test for masonry units. Determination of compressive strength

179 EN772-4 - Methods of test for masonry units. Determination of real and bulk density and of total and open porosity for natural stone masonry units

180 EN772-6 - Methods of test for masonry units. Determination of bending tensile strength of aggregate concrete masonry units

181 EN772-11 - Methods of test for masonry units. Determination of water absorption of aggregate concrete, autoclaved aerated concrete, manufactured stone and natural stone masonry units due to capillary action and the initial rate of water absorption of clay masonry units

182 EN772-13 - Methods of test for masonry units. Determination of net and gross dry density of masonry units (except for natural stone)

183 EN772-16 - Methods of test for masonry units. Determination of dimensions

184 EN772-20 - Methods of test for masonry units. Determination of flatness of faces of masonry units

185 EN772-21 - Methods of test for masonry units. Determination of water absorption of clay and calcium silicate masonry units by cold water absorption

186 EN932-1 - Tests for general properties of aggregates. Methods for sampling

187 EN932-3 - Tests for general properties of aggregates. Procedure and terminology for simplified petrographic description

188 EN933-1 - Tests for geometrical properties of aggregates. Determination of particle size distribution. Sieving method

189 EN933-3 - Tests for geometrical properties of aggregates. Determination of particle shape. Flakiness index

190 EN933-4 - Tests for geometrical properties of aggregates. Determination of particle shape. Shape index

191 EN933-7 - Tests for geometrical properties of aggregates. Determination of shell content. Percentage of shells in coarse aggregates

192 EN933-8 - Tests for geometrical properties of aggregates. Assessment of fines. Sand equivalent test

193 EN933-9 - Tests for geometrical properties of aggregates. Assessment of fines. Methylene blue test

194 EN933-11 - Tests for geometrical properties of aggregates. Classification test for the constituents of coarse recycled aggregate

195 EN934-1 - Admixtures for concrete, mortar and grout. Common requirements

196 EN934-2 - Admixtures for concrete, mortar and grout. Concrete admixtures. Definitions, requirements, conformity, marking and labelling

197 EN934-3 - Admixtures for concrete, mortar and grout. Admixtures for masonry mortar. Definitions, requirements, conformity and marking and labelling

198 EN934-4 - Admixtures for concrete, mortar and grout. Admixtures for grout for prestressing tendons. Definitions, requirements, conformity, marking and labelling

199 EN934-5 - Admixtures for concrete, mortar and grout. Admixtures for sprayed concrete. Definitions, requirements, conformity, marking and labelling

200 EN934-6 - Admixtures for concrete, mortar and grout. Sampling, conformity control and evaluation of conformity

201 EN969 - Ductile iron pipes, fittings, accessories and their joints for gas pipelines. Requirements and test methods

202 EN984 - Textile floor coverings. Determination of the mass per unit area of the use surface of needled floor coverings

203 EN985 - Textile floor coverings. Castor chair test

204	EN986 - Textile floor coverings. Tiles. Determination of dimensional changes due to the effects of varied water and heat conditions and distortion out of plane
205	EN994 - Textile floor coverings. Determination of the side length, squareness and straightness of tiles
206	EN1008 - Mixing water for concrete. Specification for sampling, testing and assessing the suitability of water, including water recovered from processes in the concrete industry, as mixing water for concrete
207	EN1015-4 - Methods of test for mortar for masonry. Determination of consistence of fresh mortar (by plunger penetration)
208	EN1015-9 - Methods of test for mortar for masonry. Determination of workable life and correction time of fresh mortar
209	EN1015-11 - Methods of test for mortar for masonry. Determination of flexural and compressive strength of hardened mortar
210	EN1015-12 - Methods of test for mortar for masonry. Determination of adhesive strength of hardened rendering and plastering mortars on substrates
211	EN1074-1 - Valves for water supply. Fitness for purpose requirements and appropriate verification tests. General requirements
212	EN1074-2 - Valves for water supply. Fitness for purpose requirements and appropriate verification tests. Isolating valves
213	EN1074-3 - Valves for water supply. Fitness for purpose requirements and appropriate verification tests. Check valves
214	EN1074-4 - Valves for water supply. Fitness for purpose requirements and appropriate verification tests. Air valves
215	EN1074-5 - Valves for water supply. Fitness for purpose requirements and appropriate verification tests. Control valves
216	EN1074-6 - Valves for water supply. Fitness for purpose requirements and appropriate verification tests. Hydrants
217	EN1092-2 - Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, PN designated. Cast iron flanges
218	EN1097-1 - Tests for mechanical and physical properties of aggregates. Determination of the resistance to wear (micro-Deval)
219	EN1097-2 - Tests for mechanical and physical properties of aggregates. Methods for the determination of resistance to fragmentation
220	EN1097-3 - Tests for mechanical and physical properties of aggregates. Determination of loose bulk density and voids

221	EN1097-5 - Tests for mechanical and physical properties of aggregates. Determination of the water content by drying in a ventilated oven
222	EN1097-6 - Tests for mechanical and physical properties of aggregates. Determination of particle density and water absorption
223	EN1097-8 - Tests for mechanical and physical properties of aggregates. Determination of the polished stone value
224	EN1107-1 - Flexible sheets for waterproofing. Determination of dimensional stability. Bitumen sheets for roof waterproofing
225	EN1107-2 - Flexible sheets for waterproofing. Determination of dimensional stability. Plastic and rubber sheets for roof waterproofing
226	EN1109 - Flexible sheets for waterproofing. Bitumen sheets for roof waterproofing. Determination of flexibility at low temperature
227	EN1253-1 - Gullies for buildings. Requirements
228	EN1253-2 - Gullies for buildings. Test methods
229	EN1296 - Flexible sheets for waterproofing. Bitumen, plastic and rubber sheets for roofing. Method of artificial ageing by long term exposure to elevated temperature
230	EN1297 - Flexible sheets for waterproofing. Bitumen, plastic and rubber sheets for roof waterproofing. Method of artificial ageing by long term exposure to the combination of UV radiation, elevated temperature and water
231	EN1307 - Textile floor coverings. Classification of pile carpets
232	EN1321 - Destructive test on welds in metallic materials. Macroscopic and microscopic examination of welds
233	EN1324 - Adhesives for tiles. Determination of shear adhesion strength of dispersion adhesives
234	EN1338 - Concrete paving blocks. Requirements and test methods
235	EN1339 - Concrete paving flags. Requirements and test methods
236	EN1340 - Concrete kerb units. Requirements and test methods
237	EN1346 - Adhesives for tiles. Determination of open time
238	EN1347 - Adhesives for tiles. Determination of wetting capability
239	EN1348 - Adhesives for tiles. Determination of tensile adhesion strength for cementitious adhesives
240	EN1367-2 - Tests for thermal and weathering properties of aggregates. Magnesium sulfate test

241 EN1367-4 - Tests for thermal and weathering properties of aggregates. Determination of drying shrinkage

242 EN1399 - Resilient floor coverings. Determination of resistance to stubbed and burning cigarettes

243 EN1423 - Road marking materials. Drop on materials. Glass beads, antiskid aggregates and mixtures of the two

244 EN1424 - Road marking materials. Premix glass beads

245 EN1426, BS 2000-49 - Bitumen and bituminous binders. Determination of needle penetration

246 EN1427 - Bitumen and bituminous binders. Determination of the softening point. Ring and Ball method

247 EN1435 - Non-destructive examination of welds. Radiographic examination of welded joints

248 EN1436 - Road marking materials. Road marking performance for road users

249 EN1463-1 - Road marking materials. Retroreflecting road studs. Initial performance requirements

250 EN1469 - Natural stone products. Slabs for cladding. Requirements

251 EN1470 - Textile floor coverings. Classification of needled floor coverings except for needled pile floor coverings

252 EN1471 - Textile floor coverings. Assessment of changes in appearance

253 EN1533 - Wood flooring. Determination of bending strength under static load. Test methods

254 EN1534 - Wood flooring. Determination of resistance to indentation. Test method

255 EN1536 - Execution of special geotechnical works. Bored piles

256 EN1548 - Flexible sheets for waterproofing. Plastic and rubber sheets for roof waterproofing. Method for exposure to bitumen

257 EN1744-1 - Tests for chemical properties of aggregates. Chemical analysis

258 EN1744-4 - Tests for chemical properties of aggregates. Determination of water susceptibility of fillers for bituminous mixtures

259 EN1744-5 - Tests for chemical properties of aggregates. Determination of acid soluble chloride salts

260 EN1744-6 - Tests for chemical properties of aggregates. Determination of the influence of recycled aggregate extract on the initial setting time of cement

261 EN1796 - Plastics piping systems for water supply with or without pressure. Glass-reinforced thermosetting plastics (GRP) based on unsaturated polyester resin (UP)

262 EN1841 - Adhesives. Test methods for floor coverings and wall coverings. Determination of dimensional changes of a linoleum floor covering in contact with an adhesive

263 EN1847 - Flexible sheets for waterproofing. Plastics and rubber sheets for roof waterproofing. Methods for exposure to liquid chemicals, including water

264 EN1849-1 - Flexible sheets for waterproofing. Determination of thickness and mass per unit area. Bitumen sheets for roof waterproofing

265 EN1849-2 - Flexible sheets for waterproofing. Determination of thickness and mass per unit area. Plastic and rubber sheets

266 EN1910 - Wood and parquet flooring and wood panelling and cladding. Determination of dimensional stability

267 EN1916 - Concrete pipes and fittings, unreinforced, steel fibre and reinforced

268 EN1917 - Concrete manholes and inspection chambers, unreinforced, steel fibre and reinforced

269 EN1928 - Flexible sheets for waterproofing. Bitumen, plastic and rubber sheets for roof waterproofing. Determination of watertightness

270 EN1931 - Flexible sheets for waterproofing. Bitumen, plastic and rubber sheets for roof waterproofing. Determination of water vapour transmission properties

271 EN1963 - Textile floor coverings. Tests using the Lisson Tretrad machine

272 EN1997-1 - Eurocode 7. Geotechnical design. General rules

273 EN1997-2 - Eurocode 7. Geotechnical design. Ground investigation and testing

274 EN10025-1 - Hot rolled products of structural steels. General technical delivery conditions

275 EN10045-1 - Charpy impact test on metallic materials. Test method (V- and U-notches)

276 EN12002 - Adhesives for tiles. Determination of transverse deformation for cementitious adhesives and grouts

277 EN12003 - Adhesives for tiles. Determination of shear adhesion strength of reaction resin adhesives

278 EN12004 - Adhesives for tiles. Requirements, evaluation of conformity, classification and designation

279 EN12020-2 - Aluminium and aluminium alloys. Extruded precision profiles in alloys EN AW-6060 and EN AW-6063. Tolerances on dimensions and form

280 EN12057 - Natural stone products. Modular tiles. Requirements

281 EN12058 - Natural stone products. Slabs for floors and stairs. Requirements

282 EN12059 - Natural stone products. Dimensional stone work. Requirements

283 EN12105 - Resilient floor coverings. Determination of moisture content of agglomerated composition cork

284 EN12190 - Products and systems for the protection and repair of concrete structures. Test methods. Determination of compressive strength of repair mortar

285 EN12228 - Surfaces for sports areas. Determination of joint strength of synthetic surfaces

286 EN12234 - Surfaces for sports areas. Determination of ball roll behaviour

287 EN12310-1 - Flexible sheets for waterproofing. Determination of resistance to tearing (nail shank). Bitumen sheets for roof waterproofing

288 EN12310-2 - Flexible sheets for waterproofing. Determination of resistance to tearing (nail shank). Plastic and rubber sheets for roof waterproofing

289 EN12311-1 - Flexible sheets for waterproofing. Determination of tensile properties. Bitumen sheets for roof waterproofing

290 EN12311-2 - Flexible sheets for waterproofing. Determination of tensile properties. Plastic and rubber sheets for roof waterproofing

291 EN12316-1 - Flexible sheets for waterproofing. Determination of peel resistance of joints. Bitumen sheets for roof waterproofing

292 EN12316-2 - Flexible sheets for waterproofing. Determination of peel resistance of joints. Plastic and rubber sheets for roof waterproofing

293 EN12317-1 - Flexible sheets for waterproofing. Bitumen sheets for roof waterproofing. Determination of shear resistance of joints

294 EN12317-2 - Flexible sheets for waterproofing. Determination of shear resistance of joints. Plastic and rubber sheets for roof waterproofing

295 EN12350-1 - Testing fresh concrete. Sampling

296 EN12350-3 - Testing fresh concrete. Vebe test

297 EN12350-2 - Testing fresh concrete. Slump-test

298 EN12350-4 - Testing fresh concrete. Degree of compactability

299 EN12350-5 - Testing fresh concrete. Flow table test

300 EN12350-6 - Testing fresh concrete. Density

301 EN12350-7 - Testing fresh concrete. Air content. Pressure method

302 EN12372 - Natural stone test methods. Determination of flexural strength under concentrated load

303 EN12390-1 - Testing hardened concrete. Shape, dimensions and other requirements for specimens and moulds

304 EN12390-2 - Testing hardened concrete. Making and curing specimens for strength tests

305 EN12390-3 - Testing hardened concrete. Compressive strength of test specimens

306 EN12390-5 - Testing hardened concrete. Flexural strength of test specimens

307 EN12390-6 - Testing hardened concrete. Tensile splitting strength of test specimens

308 EN12390-7 - Testing hardened concrete. Density of hardened concrete

309 EN12390-8 - Testing hardened concrete. Depth of penetration of water under pressure

310 EN12504-1 - Testing concrete in structures. Cored specimens. Taking, examining and testing in compression

311 EN12504-2 - Testing concrete in structures. Non-destructive testing. Determination of rebound number

312 EN12504-4 - Testing concrete. Determination of ultrasonic pulse velocity

313 EN12517-1 - Non-destructive testing of welds. Evaluation of welded joints in steel, nickel, titanium and their alloys by radiography. Acceptance levels

314 EN12517-2 - Non-destructive testing of welds. Evaluation of welded joints in aluminium and its alloys by radiography. Acceptance levels

315 EN12591 - Bitumen and bituminous binders. Specifications for paving grade bitumens

316 EN12592 - Bitumen and bituminous binders. Determination of solubility

317 EN12593, BS 2000-80 - Bitumen and bituminous binders. Determination of the Fraass breaking point

318 EN12594, BS 2000-461 - Bitumen and bituminous binders. Preparation of test samples

319 EN12595, BS 2000-319 - Bitumen and bituminous binders. Determination of kinematic viscosity

320 EN12607-1, BS 2000-460.1 - Bitumen and bituminous binders. Determination of the resistance to hardening under influence of heat and air. RTFOT method

321 EN12607-2, BS 2000-460.2 - Bitumen and bituminous binders. Determination of the resistance to hardening under influence of heat and air. TFOT Method

322 EN12615 - Products and systems for the protection and repair of concrete structures. Test methods. Determination of slant shear strength

323 EN12616 - Surfaces for sports areas. Determination of water infiltration rate

324 EN12617-4 - Products and systems for the protection and repair of concrete structures. Test methods. Determination of shrinkage and expansion

325 EN12620 - Aggregates for concrete

326	EN12697-1 - Bituminous mixtures. Test methods for hot mix asphalt. Soluble binder content
327	EN12697-2 - Bituminous mixtures. Test method for hot mix asphalt. Determination of particle size distribution
328	EN12697-5 - Bituminous mixtures. Test methods for hot mix asphalt. Determination of the maximum density
329	EN12697-6 - Bituminous mixtures. Test methods for hot mix asphalt. Determination of bulk density of bituminous specimens
330	EN12697-8 - Bituminous mixtures. Test methods for hot mix asphalt. Determination of void characteristics of bituminous specimens
331	EN12697-11 - Bituminous mixtures. Test methods for hot mix asphalt. Determination of the affinity between aggregate and bitumen
332	EN12697-12 - Bituminous mixtures. Test methods for hot mix asphalt. Determination of the water sensitivity of bituminous specimens
333	EN12697-13 - Bituminous mixtures. Test methods for hot mix asphalt. Temperature measurement
334	EN12697-17 - Bituminous mixtures. Test methods for hot mix asphalt. Particle loss of porous asphalt specimen
335	EN12697-18 - Bituminous mixtures. Test methods for hot mix asphalt. Binder drainage
336	EN12697-22 - Bituminous mixtures. Test methods for hot mix asphalt. Wheel tracking
337	EN12697-24 - Bituminous mixtures. Test methods for hot mix asphalt. Resistance to fatigue
338	EN12697-26 - Bituminous mixtures. Test methods for hot mix asphalt. Stiffness
339	EN12697-27 - Bituminous mixtures. Test methods for hot mix asphalt. Sampling
340	EN12697-28 - Bituminous mixtures. Test methods for hot mix asphalt. Preparation of samples for determining binder content, water content and grading
341	EN12697-29 - Bituminous mixtures. Test methods for hot mix asphalt. Determination of the dimensions of a bituminous specimen
342	EN12697-30 - Bituminous mixtures. Test methods for hot mix asphalt. Specimen preparation by impact compactor
343	EN12697-31 - Bituminous mixtures. Test methods for hot mix asphalt. Specimen preparation by gyratory compactor
344	EN12697-33 - Bituminous mixtures. Test methods for hot mix asphalt. Specimen prepared by roller compactor
345	EN12697-34 - Bituminous mixtures. Test methods for hot mix asphalt. Marshall test

346 EN12697-35 - Bituminous mixtures. Test methods for hot mix asphalt. Laboratory mixing

347 EN12697-36 - Bituminous mixtures. Test methods for hot mix asphalt. Determination of the thickness of a bituminous pavement

348 EN12697-39 - Bituminous mixtures. Test methods for hot mix asphalt. Binder content by ignition

349 EN12808-1 - Grouts for tiles. Determination of chemical resistance of reaction resin mortars

350 EN12808-2 - Grouts for tiles. Determination of resistance to abrasion

351 EN12808-3 - Grouts for tiles. Determination of flexural and compressive strength

352 EN12808-4 - Grouts for tiles. Determination of shrinkage

353 EN12808-5 - Grouts for tiles. Determination of water absorption

354 EN12878 - Pigments for the colouring of building materials based on cement and/or lime. Specifications and methods of test

355 EN12899-1 - Fixed, vertical road traffic signs. Fixed signs

356 EN12970 - Mastic asphalt for waterproofing. Definitions, requirements and test methods

357 EN13036-1 - Road and airfield surface characteristics. Test methods. Measurement of pavement surface macrotexture depth using a volumetric patch technique

358 EN13036-4 - Road and airfield surface characteristics. Test methods. Method for measurement of slip/skid resistance of a surface. The pendulum test

359 EN13036-7 - Road and airfield surface characteristics. Test methods. Irregularity measurement of pavement courses. The straightedge test

360 EN13055-1 - Lightweight aggregates. Lightweight aggregates for concrete, mortar and grout

361 EN13055-2 - Lightweight aggregates. Lightweight aggregates for bituminous mixtures and surface treatments and for unbound and bound applications

362 EN13111 - Flexible sheets for waterproofing. Underlays for discontinuous roofing and walls. Determination of resistance to water penetration

363 EN13263-1 - Silica fume for concrete. Definitions, requirements and conformity criteria

364 EN13263-2 - Silica fume for concrete. Conformity evaluation

365 EN13286-44 - Unbound and hydraulically bound mixtures. Test method for the determination of the alpha coefficient of vitrified blast furnace slag

366 EN13297 - Textile floor coverings. Classification of needled pile floor coverings

367 EN13302, BS 2000-505 - Bitumen and bituminous binders. Determination of dynamic viscosity of bituminous binder using a rotating spindle apparatus

368 EN13303, BS 2000-506 - Bitumen and bituminous binders. Determination of the loss in mass after heating of industrial bitumen

369 EN13304 - Bitumen and bituminous binders – Oxidised bitumens

370 EN13305 - Bitumen and bituminous binders – Framework specification for hard industrial bitumens

371 EN13329 - Laminate floor coverings. Elements with a surface layer based on aminoplastic thermosetting resins. Specifications, requirements and test methods

372 EN13395-1 - Products and systems for the protection and repair of concrete structures. Test methods. Determination of workability. Test for flow of thixotropic mortars

373 EN13395-2 - Products and systems for the protection and repair of concrete structures. Test methods. Determination of workability. Test for flow of grout or mortar

374 EN13395-3 - Products and systems for the protection and repair of concrete structures. Test methods. Determination of workability. Test for flow of repair concrete

375 EN13395-4 - Products and systems for the protection and repair of concrete structures. Test methods. Determination of workability. Application of repair mortar overhead

376 EN13398, BS 2000-516 - Bitumen and bituminous binders. Determination of the elastic recovery of modified bitumen

377 EN13399, BS 2000-517 - Bitumen and bituminous binders. Determination of storage stability of modified bitumen

378 EN13823 - Reaction to fire tests for building products. Building products excluding floorings exposed to the thermal attack by a single burning item

379 EN13416 - Flexible sheets for waterproofing. Bitumen, plastic and rubber sheets for roof waterproofing. Rules for sampling

380 EN13442 - Wood and parquet flooring and wood panelling and cladding. Determination of the resistance to chemical agents

381 EN13589 - Bitumen and bituminous binders. Determination of the tensile properties of modified bitumen by the force ductility method

382 EN13596 - Flexible sheets for waterproofing. Waterproofing of concrete bridge decks and other concrete surfaces trafficable by vehicles. Determination of bond strength

383 EN13598-1 - Plastics piping systems for non-pressure underground drainage and sewerage. Unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE). Specifications for ancillary fittings including shallow inspection chambers

384 EN13647 - Wood flooring and wood panelling and cladding. Determination of geometrical characteristics

385 EN13696 - Wood flooring. Test methods to determine elasticity and resistance to wear and impact resistance

386	EN13702, BS 2000-513 - Bitumen and bituminous binders. Determination of dynamic viscosity of modified bitumen by cone and plate method
387	EN13738 - Geotextiles and geotextile-related products. Determination of pullout resistance in soil
388	EN13748-1 - Terrazzo tiles. Terrazzo tiles for internal use
389	EN13748-2 - Terrazzo tiles. Terrazzo tiles for external use
390	EN13808 - Bitumen and bituminous binders. Framework for specifying cationic bituminous emulsions
391	EN13888 - Grout for tiles. Requirements, evaluation of conformity, classification and designation
392	EN13892-1 - Methods of test for screed materials. Sampling, making and curing specimens for test
393	EN13892-2 - Methods of test for screed materials. Determination of flexural and compressive strength
394	EN13892-8 - Methods of test for screed materials. Determination of bond strength
395	EN13924 - Bitumen and bituminous binders – Specifications for hard paving grade bitumens
396	EN13964 - Suspended ceilings. Requirements and test methods
397	EN13967 - Flexible sheets for waterproofing. Plastic and rubber damp proof sheets including plastic and rubber basement tanking sheet. Definitions and characteristics
398	EN14023 - Bitumen and bituminous binders – Specification framework for polymer modified bitumens
399	EN14223 - Flexible sheets for waterproofing. Waterproofing of concrete bridge decks and other concrete surfaces trafficable by vehicles. Determination of water absorption
400	EN14227-1 - Unbound and hydraulically bound mixtures. Specifications. Cement bound granular mixtures
401	EN14227-2 - Hydraulically bound mixtures. Specifications. Slag bound mixtures
402	EN14227-3 - Hydraulically bound mixtures. Specifications. Fly ash bound mixtures
403	EN14227-4 - Hydraulically bound mixtures. Specifications. Fly ash for hydraulically bound mixtures
404	EN14227-10 - Hydraulically bound mixtures. Specifications. Soil treated by cement
405	EN14227-11 - Unbound and hydraulically bound mixtures. Specifications. Soil treated by lime
406	EN14227-12 - Hydraulically bound mixtures. Specifications. Soil treated by slag

407 EN14227-13 - Hydraulically bound mixtures. Specifications. Soil treated by hydraulic road binder

408 EN14227-14 - Hydraulically bound mixtures. Specifications. Soil treated by fly ash

409 EN14231 - Natural stone test methods. Determination of the slip resistance by means of the pendulum tester

410 EN14259 - Adhesives for floor covering. Requirements for mechanical and electrical performance

411 EN14293 - Adhesives. Adhesives for bonding parquet to subfloor. Test methods and minimum requirements

412 EN14342 - Wood flooring. Characteristics, evaluation of conformity and marking

413 EN14364 - Plastics piping systems for drainage and sewerage with or without pressure. Glass-reinforced thermosetting plastics (GRP) based on unsaturated polyester resin (UP). Specifications for pipes, fittings and joints

414 EN14411 - Ceramic tiles. Definitions, classification, characteristics and marking

415 EN14565 - Resilient floor coverings. Floor coverings based upon synthetic thermoplastic polymers. Specification

416 EN14617-12 - Agglomerated stone. Test methods. Determination of dimensional stability

417 EN14630 - Products and systems for the protection and repair of concrete structures. Test methods. Determination of carbonation depth in hardened concrete by the phenolphthalein method

418 EN14636-1 - Plastics piping systems for non-pressure drainage and sewerage. Polyester resin concrete (PRC). Pipes and fittings with flexible joints

419 EN14636-2 - Plastics piping systems for non-pressure drainage and sewerage. Polyester resin concrete (PRC). Manholes and inspection chambers

420 EN14691 - Flexible sheets for waterproofing. Waterproofing of concrete bridge decks and other concrete surfaces trafficable by vehicles. Compatibility by heat conditioning

421 EN14692 - Flexible sheets for waterproofing. Waterproofing of concrete bridge decks and other concrete surfaces trafficable by vehicles. Determination of the resistance to compaction of an asphalt layer

422 EN14693 - Flexible sheets for waterproofing. Waterproofing of concrete bridge decks and other concrete surfaces trafficable by vehicles. Determination of the behaviour of bitumen sheets during application of mastic asphalt

423 EN14694 - Flexible sheets for waterproofing. Waterproofing of concrete bridge decks and other concrete surfaces trafficable by vehicles. Determination of resistance to dynamic water pressure after damage by pre-treatment

424 EN14762 - Wood flooring. Sampling procedures for evaluation of conformity

425 EN14769, BS 2000-535 - Methods of test for petroleum and its products. Bitumen and bituminous binders. Accelerated long-term ageing conditioning by a pressure ageing vessel (PAV)

426 EN14770, BS 2000-536 - Methods of test for petroleum and its products. Bitumen and bituminous binders. Determination of complex shear modulus and phase angle. Dynamic Shear Rheometer (DSR)

427 EN14771, BS 2000-533 - Bitumen and bituminous binders. Determination of the flexural creep stiffness. Bending Beam Rheometer (BBR)

428 EN14808 - Surfaces for sports areas. Determination of shock absorption

429 EN14891 - Liquid applied water impermeable products for use beneath ceramic tiling bonded with adhesives. Requirements, test methods, evaluation of conformity, classification and designation

430 EN14810 - Surfaces for sports areas. Determination of spike resistance

431 EN14836 - Synthetic surfaces for outdoor sports areas. Exposure to artificial weathering

432 EN14837 - Surfaces for sports areas. Determination of slip resistance

433 EN14877 - Synthetic surfaces for outdoor sports areas. Specification

434 EN14901 - Ductile iron pipes, fittings and accessories. Epoxy coating (heavy duty) of ductile iron fittings and accessories. Requirements and test methods

435 EN14904 - Surfaces for sports areas. Indoor surfaces for multi-sports use. Specification

436 EN14978 - Laminate floor coverings. Elements with acrylic based surface layer, electron beam cured. Specifications, requirements and test methods

437 EN15167-1 - Ground granulated blast furnace slag for use in concrete, mortar and grout. Definitions, specifications and conformity criteria

438 EN15167-2 - Ground granulated blast furnace slag for use in concrete, mortar and grout. Conformity evaluation

439 EN15189 - Ductile iron pipes, fittings and accessories. External polyurethane coating for pipes. Requirements and test methods

440 EN15301-1 - Surfaces for sports areas. Determination of rotational resistance

441 EN15322 - Bitumen and bituminous binders. Framework for specifying cut-back and fluxed bituminous binders

442 EN15330-1 - Surfaces for sports areas. Synthetic turf and needle-punched surfaces primarily designed for outdoor use. Specification for synthetic turf

443 EN15330-2 - Surfaces for sports areas. Synthetic turf and needle- punched surfaces primarily designed for outdoor use. Specification for needle-punched surfaces

444 EN15468 - Laminate floor coverings. Elements with directly applied printing and resin surface layer. Specifications, requirements and test methods

445 EN15617 - Non-destructive testing of welds. Time-of-flight diffraction technique (TOFD). Acceptance levels

446 EN15813 - Polymer modified bituminous thick coatings for waterproofing. Determination of flexibility at low temperatures

447 EN15814 - Polymer modified bituminous thick coatings for waterproofing. Definitions and requirements

448 EN15816 - Polymer modified bituminous thick coatings for waterproofing. Resistance to rain

449 EN15817 - Polymer modified bituminous thick coatings for waterproofing. Water resistance

450 EN15820 - Polymer modified bituminous thick coatings for waterproofing. Determination of watertightness

451 EN16002 - Flexible sheets for waterproofing. Determination of the resistance to wind load of mechanically fastened flexible sheets for roof waterproofing

452 EN60893-2 - Insulating materials. Industrial rigid laminated sheets based on thermosetting resins for electrical purposes. Methods of test

453 ISO 148-1 - Metallic materials. Charpy pendulum impact test. Test method

454 ISO 527-1, BS 2782-3, ISO 527-1 - Plastics. Determination of tensile properties. General principles

455 ISO 527-2, BS 2782-3 - Plastics. Determination of tensile properties. Test conditions for moulding and extrusion plastics

456 ISO 527-3, BS 2782-3 - Plastics. Determination of tensile properties. Test conditions for films and sheets

457 ISO 527-5 - Plastics. Determination of tensile properties. Test conditions for unidirectional fibre-reinforced plastic composites

458 ISO 787-9 - General methods of test for pigments and extenders. Determination of pH value of aqueous suspension

459 ISO 1452-1 - Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure. Unplasticized poly(vinyl chloride) (PVC U). General

460 ISO 1452-2 - Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure. Unplasticized poly(vinyl chloride) (PVC U). Pipes

461 ISO 1452-3 - Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure. Unplasticized poly(vinyl chloride) (PVC U). Fittings

462 ISO 1452-4 - Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure. Unplasticized poly(vinyl chloride) (PVC U). Valves

463 ISO 1452-5 - Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure. Unplasticized poly(vinyl chloride) (PVC U). Fitness for purpose of the system

464 ISO 1461 - Hot dip galvanized coatings on fabricated iron and steel articles. Specifications and test methods

465 ISO 1519 - Paints and varnishes. Bend test (cylindrical mandrel)

466 ISO 2409, BS 3900-E6 - Paints and varnishes. Cross-cut test

467 ISO 2592, BS 2000-36 - Determination of flash and fire points. Cleveland open cup method

468 ISO 2719, BS 2000-34 - Determination of flash point. Pensky-Martens closed cup method

469 ISO 2812-1 - Paints and varnishes. Determination of resistance to liquids. Immersion in liquids other than water

470 ISO 2812-2 - Paints and varnishes. Determination of resistance to liquids. Water immersion

471 ISO 2812-3 - Paints and varnishes. Determination of resistance to liquids. Method using an absorbent medium

472 ISO 2812-4 - Paints and varnishes. Determination of resistance to liquids. Spotting methods

473 ISO 2812-5 - Paints and varnishes. Determination of resistance to liquids. Temperature-gradient oven method

474 ISO 2813 - Paints and varnishes. Measurement of specular gloss of non-metallic paint films at 20°, 60° and 85°

475 ISO 2814, BS 3900-D4 - Paints and varnishes. Comparison of contrast ratio (hiding power) of paints of the same type and colour

476 ISO 3059 - Non-destructive testing. Penetrant testing and magnetic particle testing. Viewing conditions

477 ISO 4136 - Destructive tests on welds in metallic materials. Transverse tensile test

478 ISO 4624, BS 3900-E10 - Paints and varnishes. Pull-off test for adhesion

479 ISO 5173 - Destructive tests on welds in metallic materials. Bend tests

480 ISO 6506-1 - Metallic materials. Brinell hardness test. Test method

481 ISO 6508-1 - Metallic materials. Rockwell hardness test. Test method (scales A, B, C, D, E, F, G, H, K, N, T)

482 ISO 6892-1 - Metallic materials. Tensile testing. Method of test at ambient temperature

483 ISO 9015-1 - Destructive tests on welds in metallic materials. Hardness testing. Hardness test on arc welded joints

484 ISO 9015-2 - Destructive tests on welds in metallic materials. Hardness testing. Microhardness testing of welded joints

485 ISO 9016 - Destructive tests on welds in metallic materials. Impact tests. Test specimen location, notch orientation and examination

486 ISO 9239-1 - Reaction to fire tests for floorings. Determination of the burning behaviour using a radiant heat source

487 ISO 9863-1 - Geosynthetics. Determination of thickness at specified pressures. Single layers

488 ISO 9863-2 - Geotextiles and geotextile-related products. Determination of thickness at specified pressures. Procedure for determination of thickness of single layers of multilayer products

489 ISO 9864 - Geosynthetics. Test method for the determination of mass per unit area of geotextiles and geotextile-related products

490 ISO 9934-1 - Non-destructive testing. Magnetic particle testing. General principles

491 ISO 9963-1, BS 6068-2.51: - Water quality. Determination of alkalinity. Determination of total and composite alkalinity

492 ISO 9963-2, BS 6068-2.52 - Water quality. Determination of alkalinity. Determination of carbonate alkalinity

493 ISO 10319 - Geosynthetics. Wide-width tensile test

494 ISO 10321 - Geosynthetics. Tensile test for joints/seams by wide-width strip method

495 ISO 10416 - Petroleum and natural gas industries. Drilling fluids. Laboratory testing

496 ISO 10545-1 - Ceramic tiles. Sampling and basis for acceptance

497 ISO 10545-2 - Ceramic tiles. Determination of dimensions and surface quality

498 ISO 10545-3 - Ceramic tiles. Determination of water absorption, apparent porosity, apparent relative density and bulk density

499 ISO 10545-4 - Ceramic tiles. Determination of modulus of rupture and breaking strength

500 ISO 10545-5 - Ceramic tiles. Determination of impact resistance by measurement of coefficient of restitution

501 ISO 10545-6 - Ceramic tiles. Determination of resistance to deep abrasion for unglazed tiles

502 ISO 10545-7 - Ceramic tiles. Determination of resistance to surface abrasion for glazed tiles

503 ISO 10545-8 - Ceramic tiles. Determination of linear thermal expansion

504 ISO 10545-10 - Ceramic tiles. Determination of moisture expansion

505 ISO 10545-11 - Ceramic tiles. Determination of crazing resistance for glazed tiles

506 ISO 10545-13 - Ceramic tiles. Determination of chemical resistance

507 ISO 10545-14 - Ceramic tiles. Determination of resistance to stains

508 ISO 10863 - Non-destructive testing of welds. Ultrasonic testing. Use of time-of-flight diffraction technique (TOFD)

509 ISO 10893-6 - Non-destructive testing of steel tubes. Radiographic testing of the weld seam of welded steel tubes for the detection of imperfections

510 ISO 10893-7 - Non-destructive testing of steel tubes. Digital radiographic testing of the weld seam of welded steel tubes for the detection of imperfections

511 ISO 10893-11 - Non-destructive testing of steel tubes. Automated ultrasonic testing of the weld seam of welded steel tubes for the detection of longitudinal and/or transverse imperfections

512 ISO 11058 - Geotextiles and geotextile-related products. Determination of water permeability characteristics normal to the plane, without load

513 ISO 11600 - Building construction. Jointing products. Classification and requirements for sealants

514 ISO 11666 - Non-destructive testing of welds. Ultrasonic testing. Acceptance levels

515 ISO 11857 - Textile floor coverings. Determination of resistance to delamination

516 ISO 11890-1 - Paints and varnishes. Determination of volatile organic compound (VOC) content. Difference method

517 ISO 11890-2 - Paints and varnishes. Determination of volatile organic compound (VOC) content. Gas-chromatographic method

518 ISO 12236 - Geosynthetics. Static puncture test (CBR test)

519 ISO 12956 - Geotextiles and geotextile-related products. Determination of the characteristic opening size

520 ISO 13433 - Geosynthetics. Dynamic perforation test (cone drop test)

521 ISO 13845, BS 2782-11 - Plastics piping systems. Elastomeric-sealing-ring-type socket joints for use with unplasticized poly(vinyl chloride) (PVC-U) pipes. Test method for leaktightness under internal pressure and with angular deflection

522 ISO 14688-1 - Geotechnical investigation and testing. Identification and classification of soil. Identification and description

523 ISO 14688-2 - Geotechnical investigation and testing. Identification and classification of soil. Principles for a classification

524 ISO 14689-1 - Geotechnical investigation and testing. Identification and classification of rock. Identification and description

525 ISO 15614-1 - Specification and qualification of welding procedures for metallic materials. Welding procedure test. Arc and gas welding of steels and arc welding of nickel and nickel alloys

526 ISO 15614-2 - Specification and qualification of welding procedures for metallic materials. Welding procedure test. Arc welding of aluminium and its alloys

527 ISO 15614-3 - Specification and qualification of welding procedures for metallic materials. Welding procedure test. Fusion welding of non-alloyed and low-alloyed cast irons

528 ISO 15614-4 - Specification and qualification of welding procedures for metallic materials. Welding procedure test. Finishing welding of aluminium castings

529 ISO 15614-5 - Specification and qualification of welding procedures for metallic materials. Welding procedure test. Arc welding of titanium, zirconium and their alloys

530 ISO 15614-6 - Specification and qualification of welding procedures for metallic materials. Welding procedure test. Arc and gas welding of copper and its alloys

531 ISO 15614-7 - Specification and qualification of welding procedures for metallic materials. Welding procedure test. Overlay welding

532 ISO 15614-8 - Specification and qualification of welding procedures for metallic materials. Welding procedure test. Welding of tubes to tube-plate joints

533 ISO 15614-10 - Specification and qualification of welding procedures for metallic materials. Welding procedure test. Hyperbaric dry welding

534 ISO 15614-11 - Specification and qualification of welding procedures for metallic materials. Welding procedure test. Electron and laser beam welding

535 ISO 15614-12 - Specification and qualification of welding procedures for metallic materials. Welding procedure test. Spot, seam and projection welding

536 ISO 15614-13 - Specification and qualification of welding procedures for metallic materials. Welding procedure test. Resistance butt and flash welding

537 ISO 15630-1 - Steel for the reinforcement and prestressing of concrete. Test methods. Reinforcing bars, wire rod and wire

538 ISO 15630-2 - Steel for the reinforcement and prestressing of concrete. Test methods. Welded fabric

539 ISO 15630-3 - Steel for the reinforcement and prestressing of concrete. Test methods. Prestressing steel

540 ISO 17637 - Non-destructive testing of welds. Visual testing of fusion-welded joints

541 ISO 17638 - Non-destructive testing of welds. Magnetic particle testing

542 ISO 17640 - Non-destructive testing of welds. Ultrasonic testing. Techniques, testing levels, and assessment

543 ISO 22475-1 - Geotechnical investigation and testing. Sampling methods and groundwater measurements. Technical principles for execution

544 ISO 22476-2 - Geotechnical investigation and testing. Field testing. Dynamic probing

545 ISO 22476-3 - Geotechnical investigation and testing. Field testing. Standard penetration test

546 ISO 22476-12 - Geotechnical investigation and testing. Field testing. Mechanical cone penetration test (CPTM)

547 ISO 22825 - Non-destructive testing of welds. Ultrasonic testing. Testing of welds in austenitic steels and nickel-based alloys

548 ISO 23277 - Non-destructive testing of welds. Penetrant testing of welds. Acceptance levels

549 ISO 23278 - Non-destructive testing of welds. Magnetic particle testing of welds. Acceptance levels

550 ISO 23279 - Non-destructive testing of welds. Ultrasonic testing. Characterization of indications in welds

551 ISO 34-2 - Rubber, vulcanized or thermoplastic. Determination of tear strength. Small (Delft) test pieces

552 ISO 37 - Rubber, vulcanized or thermoplastic. Determination of tensile stress-strain properties

553 ISO 48 - Rubber, vulcanized or thermoplastic. Determination of hardness (hardness between 10 IRHD and 100 IRHD)

554 ISO 124 - Latex, rubber. Determination of total solids content

555 ISO 1766 - Textile floor coverings. Determination of thickness of pile above the substrate

556 ISO 2531 - Ductile iron pipes, fittings, accessories and their joints for water applications

557 ISO 7619-1 - Rubber, vulcanized or thermoplastic. Determination of indentation hardness. Durometer method (Shore hardness)

558 ISO 7619-2 - Rubber, vulcanized or thermoplastic. Determination of indentation hardness. IRHD pocket meter method

559 ISO 8543 - Textile floor coverings. Methods for determination of mass

560 ISO 10580 - Resilient, textile and laminate floor coverings. Test method for volatile organic compound (VOC) emissions

561 ISO 10834 - Textile floor coverings. Non-destructive measurement of pile thickness above the backing. WRONZ gauge method

562 ISO 10874 - Resilient, textile and laminate floor coverings. Classification

563 ISO 11475 - Paper and board. Determination of CIE whiteness, D65/10° (outdoor daylight)

564 ISO 13007-1 - Ceramic tiles. Grouts and adhesives. Terms, definitions and specifications for adhesives

565 ISO 13007-2 - Ceramic tiles. Grouts and adhesives. Test methods for adhesives

566 ISO 13007-3 - Ceramic tiles. Grouts and adhesives. Terms, definitions and specifications for grouts

567 ISO 13007-4 - Ceramic tiles. Grouts and adhesives. Test methods for grouts

568 ISO 17984 - Machine-made textile floor coverings. Determination of dimensional changes after exposure to heat and/or water

569 ISO 23999 - Resilient floor coverings. Determination of dimensional stability and curling after exposure to heat

570 ISO 24334 - Laminate floor coverings. Determination of locking strength for mechanically assembled panels

571 ISO 24335 - Laminate floor coverings. Determination of impact resistance

572 ISO 24336 - Laminate floor coverings. Determination of thickness swelling after partial immersion in water

573 ISO 24341 - Resilient and textile floor coverings. Determination of length, width and straightness of sheet

574 ISO 24343-1 - Resilient and laminate floor coverings. Determination of indentation and residual indentation. Residual indentation

575 ISO 25620 - Laminate floor coverings. Determination of long-side friction for mechanically assembled panels

576 ISO 26985 - Resilient floor coverings. Identification of linoleum and determination of cement content and ash residue

15.46.9 American Public Health Association (APHA):

1 APHA 2130 - Turbidity

2 APHA 2320 - Alkalinity

3 APHA 2340 - Hardness

4 APHA 2510 - Conductivity

5 APHA 2540 - Solids

6 APHA 2710 - Tests on Sludges

7 APHA 3110 - Metals by Atomic Absorption Spectrometry

8 APHA 3120 - Metals by Plasma Emission Spectroscopy

9	APHA 3500-Al - Aluminium
10	APHA 3500-As - Arsenic
11	APHA 3500-Ca - Calcium
12	APHA 3500-Cd - Cadmium
13	APHA 3500-Cu - Copper
14	APHA 3500-Hg - Mercury
15	APHA 3500-K - Potassium
16	APHA 3500-Na - Sodium
17	APHA 3500-Ni - Nickel
18	APHA 3500-Mg - Magnesium
19	APHA 3500-Pb - Lead
20	APHA 3500-Se - Selenium
21	APHA 3500-Sr - Strontium
22	APHA 3500-Zn - Zinc
23	APHA 4500-Br - Boron
24	APHA 4500-Br^- - Bromide
25	APHA 4500-Cl - Chlorine (Residual)
26	APHA 4500-Cl^- - Chloride
27	APHA 4500-CN^- - Cyanide
28	APHA 4500-F^- - Fluoride
29	APHA 4500-H+ - pH Value
30	APHA 4500-N - Nitrogen
31	APHA 4500-Norg - Nitrogen (Organic)
32	APHA 4500-NH3 - Nitrogen (Ammonia)
33	APHA 4500-$NO2^-$ - Nitrogen (Nitrite)
34	APHA 4500-$NO3^-$ - Nitrogen (Nitrate)
35	APHA 4500-O - Oxygen (Dissolved)

36 APHA 4500-P - Phosphorus

37 APHA 4500-$S2^{-}$ - Sulphide

38 APHA 4500-SiO2 - Silica

39 APHA 4500-$SO42^{-}$ - Sulphate

40 APHA 5210 - Biochemical Oxygen Demand (BOD)

41 APHA 5520 - Oil and Grease

42 APHA 5310 - Total Organic Carbon (TOC)

43 APHA 5530 - Phenols

44 APHA 6200 - Volatile Organic Compounds

45 APHA 6630 - Organochlorine Pesticides

46 APHA 9222 - Membrane Filter Technique for Members of the Coliform Group

47 APHA 9223 - Enzyme Substrate Coliform Test

48 APHA 9510 - Detection of Enteric Viruses

49 APHA 9711 - Pathogenic Protozoa

15.46.10 Deutsches Institut für Normung EV (DIN) :

1 DIN 1048-5 - Testing concrete; testing of hardened concrete (specimens prepared in mould)

2 DIN English 18134 - Determination of Deformation and Strength Characteristics of Soils by the Plate Loading Test.

3 DIN 60500 - Geotextiles and geotextile related products

15.46.11 Construction Industry Research and Information Association (CIRIA) :

1 CIRIA Report 144, Integrity Testing in Piling Practice

15.46.12 United States Environmental Protection Agency:

1 USEPA 6010C - Inductively Coupled Plasma - Atomic Emission Spectroscopy (ICP-AES)

2 USEPA 5030C - Purge and Trap for Aqueous Samples

3 USEPA 8015D - Nonhalogenated Organics Using GC/FID

15.46.13 Swiss Standard - Normes SN (Suisse):

1 SN 640550 – Essais sur les sols et divers relatif à la mécanique des sols - Géotextiles, définitions et descriptions d'exécution

END OF PART