

Quality Control Test Frequency Plan And Acceptance Criteria

S. No	Name Of Test	Test Code Reference	Test Frequency	Acceptance Criteria	Acceptance Criteria Reference
1) Embankment Materials / Cut Formation, MoRT&H Section 305					
1	Free Swelling Index	IS 2720 : Part 40	As Required	≤ 50 %	MoRT&H Clause 305.2.1.2
2	Sieve Analysis (Sand Content)	IS 2720 : Part 4	2 test per 3000 m ³	-	MoRT&H Clause 903.2.1
3	Density Test (Modified Proctor Test)	IS 2720 : Part 8	2 test per 3000 m ³	i) Embankment upto 3m height, not subjected to Flooding, MDD > 15.2 KN/m ³ ii) Embankment exceeding 3m height or embankment of any height subjected to long periods of inundation, MDD > 16.0 KN/m ³	MoRT&H Table 300-1 & 903.2.1
4	Atterbergs Limit	IS 2720 : Part 5	2 test per 3000 m ³	LL ≤ 50 % & PI ≤ 25 %	MoRT&H Clause 305.2.1.1 & 903.2.1
5	Deleterious Content Test	IS 2720 : Part 27	As Required	≤ 0.50 %	MoRT&H Clause 305.2.1.3 & 903.2.1
6	Moisture Content Test	IS 2720 : Part 2	2 test per 3000 m ³	+1% & -2% of OMC	MoRT&H Clause 305.3.5.2 & 903.2.1
7	Field Compaction Test (By Sand Replacement Method)	IS 2720 : Part 28	1set of 10 tests per 3000 m ²	For, Normal soil, Compaction ≥ 95 % For, Expansive Clay, Compaction 90 - 95 %	MoRT&H Table 300-2 & 903.2.2
8	Field Compaction Test (By NDG)	ASTM: D6938-08a	1set of 20 tests per 3000 m ²	For, Normal soil, Compaction ≥ 95 % For, Expansive Clay, Compaction 90 - 95 %	MoRT&H Table 300-2 & 903.2.2
2) Sub Grade/Shoulder Materials, MoRT&H Section 305					
1	Free Swelling Index	IS 2720 : Part 40	As Required	≤ 50 %	MoRT&H Clause 305.2.1.2
2	Sieve Analysis (Sand Content)	IS 2720 : Part 4	2 test per 3000 m ³	-	MoRT&H Clause 903.2.1
3	Density Test (Modified Proctor Test)	IS 2720 : Part 8	2 test per 3000 m ³	≥ 17.5 KN/m ³	MoRT&H Table 300-1 & 903.2.1
4	Atterbergs Limit	IS 2720 : Part 5	2 test per 3000 m ³	LL ≤ 50 % & PI ≤ 25	MoRT&H Clause 305.2.1.1 & 903.2.1
5	CBR	IS 2720 : Part 16	1 test per 3000 m ³	As per Pavement Design	-
6	Deleterious Content Test	IS 2720 : Part 27	As Required	≤ 0.50 %	MoRT&H Clause 305.2.1.3 & 903.2.1
7	Moisture Content Test	IS 2720 : Part 2	2 test per 3000 m ³	+1% & -2% of OMC	MoRT&H Clause 305.3.5.2 & 903.2.1
8	Field Compaction Test (By Sand Replacement Method)	IS 2720 : Part 28	1set of 10 tests per 2000 m ²	≥ 97 %	MoRT&H Table 300-2 & 903.2.2
9	Field Compaction Test (By NDG)	ASTM: D6938-08a	1set of 20 tests per 2000 m ²	≥ 97 %	MoRT&H Table 300-2 & 903.2.2
3) Reinforced Earth for RE Wall, MoRT&H Section 3100 & IRC SP-102					
1	Shear Parameters (Drain Condition)	IS 2720 : Part 13 IS 2720 : Part 39	As Required	Internal Friction Angle Ø > 30	MoRT&H Clause 3104
2	Sieve Analysis	IS: 2720 : Part 4	2 test per 3000 m ³	75 mm - 100% 425 micron - 0 - 60% 75 micron - less than 15%	MoRT&H Clause 3104
3	Density Test (Modified Proctor Test)	IS 2720 : Part 8	2 test per 3000 m ³	-	-
4	Atterbergs Limit	IS 2720 : Part 5	2 test per 3000 m ³	PI ≤ 6 %	MoRT&H Clause 3104
5	Deleterious Constituents	IS 2720 : Part 27	As Required	-	MoRT&H Clause 3104
6	Field Compaction Test (By Sand Replacement Method)	IS 2720 : Part 28	1set of 10 tests per 3000 m ²	≥ 97 %	MoRT&H Clause 3106.5
7	Field Compaction Test (By NDG)	ASTM: D6938-08a	1set of 20 tests per 3000 m ²	≥ 97 %	MoRT&H Clause 3106.5

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4) Back Fill material & Filter Media around structure, MoRT&H Section 305, 2504 & IRC 78 (Appendix- 6)					
1	Atterbergs Limit	IS 2720: Part 5	As Required	$LL \leq 40 \% \text{ \& } PI \leq 20 \%$	MoRT&H Clause 305.4.4
2	Shear Parameters	IS 2720 : Part 13	As Required	-	-
3	Filter Media	IS 2720 : Part 4	As Required	$\frac{D_{15}(\text{Filter})}{D_{85}(\text{Base})} < 5$ $4 < \frac{D_{15}(\text{Filter})}{D_{15}(\text{Base})} < 20$ $\frac{D_{50}(\text{Filter})}{D_{50}(\text{Base})} < 25$	MoRT&H Clause 2504.2.2
4	Density Test (Modified Proctor Test)	IS 2720 : Part 8	2 Test per 3000 m ³	-	-
5	Deleterious Constituents	IS 2720, Part 27	As Required	-	-
6	Field Compaction Test (By Sand Replacement Method)	IS 2720 : Part 28	1set of 10 tests per 3000 m ²	$\geq 95 \%$	MoRT&H Table 300-2
7	Field Compaction Test (By NDG)	ASTM: D6938-08a	1set of 20 tests per 3000 m ²	$\geq 95 \%$	MoRT&H Table 300-2
5) Flyash / Pondash as Embankment & Reinforced Earth, IRC: SP: 58					
1	Specific Gravity			1.90 - 2.55	IRC: SP: 58, Table 1
2	Plasticity	IS 2720 : Part 5	As Required	Non-Plastic	IRC: SP: 58, Table 1
3	Density Test (Modified Proctor Test)	IS 2720 : Part 8	As Required	0.9 - 1.6 gm/cc	IRC: SP: 58, Table 1
4	Optimum Moisture Content	IS 2720 : Part 8	As Required	18 - 38 %	IRC: SP: 58, Table 1
5	Cohesion	IS 2720 : Part 13	As Required	Negligible	IRC: SP: 58, Table 1
6	Angle of Internal Friction	IS 2720 : Part 13	As Required	30 - 40 Degree	IRC: SP: 58, Table 1
7	Co-efficient of Consolidation C _v			$1.75 \times 10^{-5} - 2.01 \times 10^{-3} \text{ (cm}^2/\text{sec)}$	IRC: SP: 58, Table 1
8	Compression Index C _c			0.05-0.4	IRC: SP: 58, Table 1
9	Permeability			$8 \times 10^{-6} - 7 \times 10^{-4} \text{ (cm/sec)}$	IRC: SP: 58, Table 1
10	Particle Size Distribution	IS 2720 : Part 4	As Required	Clay size fraction = 1-10 % Silt size fraction = 8-85 % Sand size fraction = 7-90% Gravel size fraction = 0-10%	IRC: SP: 58, Table 1
11	Coefficient of Uniformity	IS:1498	As Required	3.1-10.7	IRC: SP: 58, Table 1
12	Moisture Content Test	IS 2720 : Part 2	2 test per 3000 m ³	$\pm 2\%$ of OMC	IRC: SP: 58, Clause 4.7.2
13	Soluble sulphate	IS 2720 : Part 27	As required	< 1.9 gm/lit	IRC: SP: 58, Clause 3.3.1.8
14	Compaction of Original Ground	IS 2720 : Part 28	1set of 10 tests per 3000 m ²	$\geq 97 \%$	IRC: SP: 58, Clause 4.5
15	Compaction of flyash	IS 2720 : Part 28	1set of 10 tests per 3000 m ²	$\geq 95 \%$ for Embankment $\geq 97 \%$ for Reinforced Earth	IRC: SP: 58, Table 2 MoRT&H Clause 3106.5

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6) Granular Subbase (GSB) Materials, MoRT&H Section 401					
1	Gradation	IS: 2386 : Part 1	1 test per 400 m ³	Depend on Grading Type	MoRT&H Table 401 & Table 900-3
2	Density Test (Modified Proctor Test)	IS: 2720 : Part 8	As Required	-	-
3	Atterbergs Limit	IS: 2720 : Part 5	1 test per 400 m ³	LL ≤ 25 % & PI ≤ 6 %	MoRT&H Table 402 & Table 900-3
4	CBR	IS: 2720 : Part 16	As Required	≥ 30 %	MoRT&H Table 400-2 & Table 900-3
5	Deleterious Constituents	IS: 2720 : Part 27	As Required	-	Table 900-3
6	Water Absorption	IS: 2386 : Part 3	As Required	Water Absorption ≤ 2 % If Water Absorption of Aggregate is greater than 2 %, then the Aggregates shall be tested for Wet AIV (IS:5640)	MoRT&H Clause 401.2.2
7	Aggregate Impact Value	IS: 2386 : Part 4	As Required	≤ 40 %	MoRT&H Table 400-2
8	Wet Aggregate Impact Value	IS: 5640	As Required	≤ 40 %	MoRT&H Table 400-2
9	Moisture Content prior to compaction	IS: 2720 : Part 2	1 test per 400 m ³	-2%	MoRT&H Clause 401.3.2
10	Field Compaction Test (By Sand Replacement Method)	IS: 2720 : Part 28	1 test per 1000 m ²	≥ 98 %	MoRT&H Clause 401.3.2 & Table 900-3
11	Field Compaction Test (By NDG)	ASTM: D6938-08a	2 test per 1000 m ²	≥ 98 %	MoRT&H Clause 401.3.2 & Table 900-3
7) Cement Treated Base (CTSB & CTB), MoRT&H Section 403					
1	Gradation of Aggregate (Combined)	IS: 2386 : Part 1	1 Test per Day	MoRT&H Table 400-4	MoRT&H Table 400-4
2	Density Test (Modified Proctor Test)	IS: 2720 : Part 8	As Required	-	-
3	Atterbergs Limit	IS: 2720 : Part 5	As Required	LL ≤ 45 % & PI ≤ 20 %	MoRT&H Clause 403.2.1
4	Unconfined Compressive Strength	IS: 516	As Required	As per Pavement Design and 1.75 Mpa after 7 days	MoRT&H Clause 403.2.6
5	Moisture Content Prior to Compaction	IS: 2720 : Part 2	1 Set of 2 test per 500 m ²	> OMC & < OMC + 2%	MoRT&H Clause 403.3.4
6	Field Compaction Test (By Sand Replacement Method)	IS: 2720 : Part 28	1 Set of 2 test per 500 m ²	≥ 98 %	MoRT&H Clause 406.3.5
8) Wet Mix Macadam (WMM) Materials, MoRT&H Section 406					
1	Gradation of Aggregate (Combined)	IS: 2386 : Part 1	1 test per 200 m ³	MoRT&H Table 400-13	MoRT&H Table 400-13 & Table-900-3
2	Density Test (Modified Proctor Test)	IS: 2720 : Part 8	As Required	-	-
3	Atterbergs Limit	IS: 2720 : Part 5	1 test per 200 m ³	PI ≤ 6 %	MoRT&H Clause 406.2.1.2 & Table-900-3
4	Water Absorption	IS: 2386 : Part 3	As Required	Water Absorption ≤ 2 % If Water Absorption of Aggregate is greater than 2 %, then the soundness test shall be carried out on the material as per IS:2386, Part 5.	MoRT&H Clause 406.2.1.1
5	Aggregate Impact Value	IS: 2386 : Part 4	1 test per 1000 m ³	≤ 30 %	MoRT&H Table 400-12 & Table-900-3
6	Combined Flakiness & Elongation	IS: 2386 : Part 1	1 test per 500 m ³	≤ 35 %	MoRT&H Table 400-12 & Table-900-3
7	Los Angeles Abrasion Test	IS: 2386 : Part 4	1 test per Source	LAA ≤ 40 %, Optional test of AIV.	MoRT&H Table 400-12
8	Soundness of Aggregates	IS: 2386 : Part 5	1 test per Source	Loss of Weight after 5 cycles tested with : (i) Sodium Sulphate ≤ 12% (ii) Magnesium Sulphate ≤ 18%	IS: 383-2016 Clause 5.5
9	Field Compaction Test (By Sand Replacement Method)	IS: 2720 : Part 28	3 test per 1000 m ²	≥ 98 %	MoRT&H Clause 406.3.5 & Table-900-3
10	Field Compaction Test (By NDG)	ASTM: D6938-08a	6 test per 1000 m ²	≥ 98 %	MoRT&H Clause 406.3.5 & Table-900-3
9) Prime Coat, MoRT&H Section 502					

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1	Rate of spread of Binder	IRC: 16	3 test per day	WMM/WBM 0.7 - 1.0 kg/sq.m Stabilized soil bases/Crusger Run macadam 0.9 - 1.2 kg/sq.m	MoRT&H Table 500-3 & Table-900-3
10) Tack Coat, MoRT&H Section 503					
1	Rate of spread of Binder	IRC: 16	3 test per day	Bituminous surface 0.20 - 0.30 kg/sq.m Granular surface treated with primer 0.25 - 0.30 Cement concrete pavement 0.30 - 0.35 kg/sq.m	MoRT&H Table 500-5 & Table-900-3
11) Emulsion, IS 8887-2018					
1	Residue on 600 micron Sieve	IS: 8887	1 test per lot	As per type of Emulsion	IS: 8887 Table 1
2	Viscosity by saybolt	IS: 3117	1 test per lot	As per type of Emulsion	IS: 8887 Table 1
3	Coagulation of emulsion at low temperature *	--	1 test per lot	As per type of Emulsion	IS: 8887 Table 1
4	Storage Stability after 24 h	IS: 8887	1 test per lot	As per type of Emulsion	IS: 8887 Table 1
5	Particle charge	IS: 8887	1 test per lot	As per type of Emulsion	IS: 8887 Table 1
6	Stability to mixing with Cement	IS: 8887	1 test per lot	As per type of Emulsion	IS: 8887 Table 1
7	Miscibility with wate	IS: 8887	1 test per lot	As per type of Emulsion	IS: 8887 Table 1
8	Test on Residue	-	-		
i	Residue by Evaporation	IS: 8887	1 test per lot	As per type of Emulsion	IS: 8887 Table 1
ii	Penetration test @ 25°C.	IS: 1203	1 test per lot	As per type of Emulsion	IS: 8887 Table 1
iii	Ductility @ 25°C.	IS: 1208	1 test per lot	As per type of Emulsion	IS: 8887 Table 1
iv	Solubility in Trychloroethelene	IS: 1216	1 test per lot	As per type of Emulsion	IS: 8887 Table 1
9	Distillation Test	IS: 1213	1 test per lot	As per type of Emulsion	IS: 8887 Table 1
10	Water Content	IS: 1211	1 test per lot	As per type of Emulsion	
12) Bitumen Viscosity Grade, IS 73-2013					
1	Penetration test @ 25°C.	IS: 1203	1 test per lot	As per Grade of Bitumen	IS: 73 Table 1
2	Absolute Viscosity test @ 60°C.	IS: 1206 : Part 2	1 test per lot	As per Grade of Bitumen	IS: 73 Table 1
3	Kinematic Viscosity test @ 135°C.	IS: 1206 : Part 3	1 test per lot	As per Grade of Bitumen	IS: 73 Table 1
4	Flash Point (Cleveland open cup)	IS: 1209	1 test per lot	As per Grade of Bitumen	IS: 73 Table 1
5	Solubility in Trychloroethelene	IS: 1216	1 test per lot	As per Grade of Bitumen	IS: 73 Table 1
6	Softening point test	IS: 1205	1 test per lot	As per Grade of Bitumen	IS: 73 Table 1
7	Test on Residue from rolling TFOT				
a	Viscosity ratio at @ 60°C.	IS: 1206 : Part 2	1 test per lot	As per Grade of Bitumen	IS: 73 Table 1
b	Ductility at 25°C	IS: 1208	1 test per lot	As per Grade of Bitumen	IS: 73 Table 1
8	Specific Gravity	IS: 1202	1 test per Source	As per Grade of Bitumen	

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13) Modified Bitumen, IRC SP 53-2010					
1	Penetration test @ 25°C.	IS: 1203	1 test per lot	As per type of Modified Bitumen	IRC SP: 53
2	Softening point test	IS: 1205	1 test per lot	As per type of Modified Bitumen	IRC SP: 53
3	Flash Point	IS: 1209	1 test per lot	As per type of Modified Bitumen	IRC SP: 53
4	Elastic Recovery of half thread in ductilometer at 15°C.	IRC: SP 53	1 test per lot	As per type of Modified Bitumen	IRC SP: 53
5	Complex Modulus	IRC: SP 53	1 test per lot	As per type of Modified Bitumen	IRC SP: 53
6	Separation Difference in Softening Point	IRC: SP 53	1 test per lot	As per type of Modified Bitumen	IRC SP: 53
7	Viscosity @ 150° C.	IS: 1206 : Part 2	1 test per lot	As per type of Modified Bitumen	IRC SP: 53
8	TFOT test and Test on Residue				
a	Loss in mass	IS: 9382	1 test per lot	As per type of Modified Bitumen	IRC SP: 53
b	Increase in Softening Point	IS: 1205	1 test per lot	As per type of Modified Bitumen	IRC SP: 53
c	Reduction in Penetration of residue	IS: 1203	1 test per lot	As per type of Modified Bitumen	IRC SP: 53
d	Elastic Recovery of half thread @ 25° C.	IRC: SP 53	1 test per lot	As per type of Modified Bitumen	IRC SP: 53
11) Bituminous Macadam (BM), MoRT&H Section 504					
1	Gradation of Aggregate (Individual)	IS: 2386 : Part 1	2 test per Day	Not Specified	-
	Gradation of Aggregate (Combined)	IS: 2386 : Part 1	2 test per Day	Depend on Grading Type	MoRT&H Table 500-7 & Table-900-3
2	Cleanliness	IS: 2386 : Part 1	1 test per Source	Max. 5% passing 0.075 micron	MoRT&H Table 500-6
3	Combined Flakiness & Elongation	IS: 2386 : Part 1	1 test per 350 m ³	≤ 35%	MoRT&H Table 500-6 & Table-900-3
4	Aggregate Impact Value	IS: 2386 : Part 4	1 test per 200 m ³	≤ 30%	MoRT&H Table 500-6 & Table-900-3
5	Los Angeles Abrasion Test	IS: 2386 : Part 4	1 test per source	LAA ≤ 40 %, Optional test of AIV.	MoRT&H Table 500-6
6	Soundness of aggregates	IS: 2386 : Part 5	1 test per source	Loss of Weight after 5 cycles tested with : (i) Sodium Sulphate ≤ 12% (ii) Magnesium Sulphate ≤ 18%	MoRT&H Table 500-6 & Table-900-3
7	Water Absorption	IS: 2386 : Part 3	1 test per source	≤ 2%	MoRT&H Table 500-6 & Table-900-3
8	Stripping Value of Aggregates	IS: 6241	1 test per source	≥ 95%	MoRT&H Table 500-6 & Table-900-3
9	Water Sensitivity of mix (Retained Tensile Strength)	AASHTO: T 283	1 test per source	≥ 80%	MoRT&H Table 500-6
10	Binder Content	IRC: SP 11	2 test per day per Plant	± 0.3% of OBC	MoRT&H Clause 504.2.5
11	Density of Compacted Layer by Core Cutting	ASTM: D 2726	1 test per 700 m ²	-	Table-900-3-
12	Density of Compacted Layer by NDG	ASTM: D6938-08a	2 Test per 700 m ²	-	-
13	Rate of spread of Mixed Material	-	As required	-	Table-900-3-

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12) Dense Bituminous Macadam (DBM), MoRT&H Section 505					
1	Gradation of Aggregate (Individual)	IS: 2386 : Part 1	1 set for individual constituent	-	Table-900-3
	Gradation of Aggregate (Combined)	IS: 2386 : Part 1	1 set per 400 MT or Min. 2	Depend on Grading Type	MoRT&H Table 500-10
2	Cleanliness	IS: 2386 : Part 1	1 test per source	Max. 5% passing 0.075 micron	MoRT&H Table 500-8
3	Combined Flakiness & Elongation	IS: 2386 : Part 1	1 test per 350 m ³	≤ 35%	MoRT&H Table 500-8 & Table-900-3
4	Aggregate Impact Value	IS: 2386 : Part 4	1 test per 350 m ³	≤ 27%	MoRT&H Table 500-8 & Table-900-3
5	Los Angeles Abrasion Test	IS: 2386 : Part 4	1 test per source	LAA ≤ 35 % Optional test of AIV.	MoRT&H Table 500-8 & Table-900-3
6	Soundness of aggregates	IS: 2386 : Part 5	1 test per source	Loss of Weight after 5 cycles tested with : (i) Sodium Sulphate ≤ 12% (ii) Magnesium Sulphate ≤ 18%	MoRT&H Table 500-8 & Table-900-3
7	Water Absorption	IS: 2386 : Part 3	1 test per Source	≤ 2%	MoRT&H Table 500-8 & Table-900-3
8	Stripping Value of Aggregates	IS: 6241	1 test per source	≥ 95%	MoRT&H Table 500-8 & Table-900-3
9	Water Sensitivity of mix (Retained Tensile Strength)	AASHTO: T 283	1 test per source	≥ 80%	MoRT&H Table 500-8 & Table-900-3
10	Sand Equivalent Test	IS: 2720, Part 37	1 test per source	≥ 50%	MoRT&H Clause 505.2.3
11	Plasticity Index	IS: 2720, Part 5	1 test per source	≤ 4%	MoRT&H Clause 505.2.3 & Table-900-3
12	Marshall Stability	AASHTO: T 245	3 Marshall moulds for each 400 tonnes of mix subject to minimum of two Tests per day per plant	For, Viscosity Grade, 9.0 KN For, Modified Bitumen (Hot Climate), 12.0 KN For, Modified Bitumen (Cold Climate), 10.0 KN	MoRT&H Table 500-11 & Table-900-3
13	Marshall Flow	AASHTO: T 245		For, Viscosity Grade, 2-4 mm For, Modified Bitumen (Hot Climate), 2.5-4 mm For, Modified Bitumen (Cold Climate), 3.5-5 mm	
14	Marshall Quotient (Stability/Flow)	MS-2 and ASTM D2041		For, Viscosity Grade, 2-5 For, Modified Bitumen (Hot/Cold Climate), 2.5-4	
15	Marshall Density	MS-2		-	
16	% Air Voids	MS-2		3 - 5 %	
17	% Voids Filled with Bitumen, (VFB)	MS-2		65 - 75 %	
18	% Voids in Mineral Aggregat, (VMA)	MS-2		Depend on % Air Voids	MoRT&H Table 500-12
19	Maximum Specific Gravity	ASTM: D 2041	1 test per day	-	-
20	Temperature of binder in boiler, aggregate in dryer and mix at the time of laying and compaction.	-	At regular intervals		
21	Binder Content	-	1 Set per 400 MT or Min. 2	-	Table-900-3
22	Rate of spread of Mixed Material	-	After every 5th truck load	-	Table-900-3
23	Density of Compacted Layer by Core Cutting	ASTM: D 2726	1 Test per 700 m ²	≥ 92% of Theo. Gmm	MoRT&H Clause 505.3.5 & Table-900-3
24	Density of Compacted Layer by NDG	ASTM: D6938-08a	2 Test per 700 m ²	≥ 92% of Theo. Gmm	MoRT&H Clause 505.3.5

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S. No	Name Of Test	Test Code Reference	Test Frequency	Acceptance Criteria	Acceptance Criteria Reference
13) Bituminous Concrete Materials (BC), MoRT&H Section 507					
1	Gradation of Aggregate (Individual)	IS: 2386, Part 1	1 set for individual constituent	-	-
	Gradation of Aggregate (Combined)	IS: 2386, Part 1	1 set per 400 MT or Min. 2	Depend on Grading Type	MoRT&H Table 500-17
4	Combined Flakiness & Elongation	IS: 2386, Part 1	1 test per 350 m ³	≤ 35%	MoRT&H Table 500-16 & Table-900-3
2	Aggregate Impact Value	IS: 2386, Part 4	1 test per 350 m ³	≤ 24%	MoRT&H Table 500-16 & Table-900-3
3	Los Angeles Abrasion Test	IS: 2386, Part 4	1 test per source	LAA ≤ 30 % Optional test of AIV.	MoRT&H Table 500-16 & Table-900-3
6	Soundness of aggregates	IS: 2386, Part 5	1 test per source	Loss of Weight after 5 cycles tested with : (i) Sodium Sulphate ≤ 12% (ii) Magnesium Sulphate ≤ 18%	MoRT&H Table 500-16 & Table-900-3
7	Water Absorption	IS: 2386, Part 3	1 test per Source	≤ 2%	MoRT&H Table 500-16 & Table-900-3
5	Stripping Value of Aggregates	IS: 6241	1 test per Source	≥ 95%	MoRT&H Table 500-16 & Table-900-3
18	Water Sensitivity of mix (Retained Tensile Strength)	AASHTO: T 283	1 test per Source	≥ 80%	MoRT&H Table 500-16& Table-900-3
8	Sand Equivalent Test	IS: 2720, Part 37	1 test per Source	≥ 50%	MoRT&H Clause 507.2.3
9	Plasticity Index	IS: 2720, Part 5	1 test per Source	≤ 4%	MoRT&H Clause 507.2.3
10	Polished Stone Value	BS: 812, Part 114	1 test per Source	≥ 55%	MoRT&H Table 500-16 & Table-900-3
11	Marshall Stability	AASHTO: T 245	3 Marshall moulds for each 400 tonnes of mix subject to minimum of two Tests per day per plant	For, Viscosity Grade, 9.0 KN For, Modified Bitumen (Hot Climate), 12.0 KN For, Modified Bitumen (Cold Climate), 10.0 KN	MoRT&H Table 500-11 & Table-900-3
12	Marshall Flow	AASHTO: T 245		For, Viscosity Grade, 2-4 mm For, Modified Bitumen (Hot Climate), 2.5-4 mm For, Modified Bitumen (Cold Climate), 3.5-5 mm	
13	Marshall Density	MS-2		-	
14	% Air Voids	MS-2		3 - 5 %	
15	% Voids Filled with Bitumen (VFB)	MS-2		65 - 75 %	
16	% Voids in Mineral Aggregat (VMA)	MS-2		Depend on % Air Voids	MoRT&H Table 500-12
17	Maximum Specific Gravity	ASTM: D 2041	1 test per day	-	-
19	Retained Stability	ASTM: D1075	1 test per source	For Hot Climate, ≥ 90.0 % For Cold Climate, ≥ 95.0 % For High Rainfall, ≥ 100.0 %	IRC SP: 53
20	Temperature of binder in boiler, aggregate in dryer and mix at the	-	At regular intervals		
21	Binder Content	-	1 Set per 400 MT or Min. 2	-	Table-900-3 & Table-900-3
22	Rate of spread of Mixed Material	-	After every 5th truck load	-	Table-900-3 & Table-900-3
23	Density of Compacted Layer by Core Cutting	ASTM: D 2726	1 Test per 700 m ²	≥ 92% of Theo. Gmm	MoRT&H Clause 507.3.5 & Table-900-3
24	Density of Compacted Layer by NDG	ASTM: D6938-08a	1 Test per 700 m ²	≥ 92% of Theo. Gmm	MoRT&H Clause 507.3.5

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S. No	Name Of Test	Test Code Reference	Test Frequency	Acceptance Criteria	Acceptance Criteria Reference
14) Semi dense bituminous concrete Materials (SDBC)					
1	Gradation of Aggregate (Individual)	IS: 2386, Part 1	1 Set per 400 MT or Min. 2	-	-
	Gradation of Aggregate (Combined)	IS: 2386, Part 1	1 Set per 400 MT or Min. 2	Depend on Grading Type	MoRT&H Table 500-15 MORTH 4th Revision
2	Aggregate Impact Value	IS: 2386, Part 4	1 Test per 350 m3	≤ 27%	MoRT&H Table 500-14 MORTH 4th Revision
3	Los Angeles Abrasion Test	IS: 2386, Part 4	1 Test per Source	LAA ≤ 35 % Optional test of AIV.	MoRT&H Table 500-14 MORTH 4th Revision
4	Combined Flakiness & Elongation	IS: 2386, Part 1	1 Test per 350 m3	≤ 30%	MoRT&H Table 500-14 MORTH 4th Revision
5	Stripping Value of Aggregates	IS: 6241	1 Test per Source	≥ 95%	MoRT&H Table 500-14 MORTH 4th Revision
6	Soundness of aggregates	IS: 2386, Part 5	1 Test per Source	Loss of Weight after 5 cycles tested with : (i) Sodium Sulphate ≤ 12% (ii) Magnesium Sulphate ≤ 18%	MoRT&H Table 500-14 MORTH 4th Revision
7	Water Absorption	IS: 2386, Part 3	1 Test per Source	≤ 2%	MoRT&H Table 500-14 MORTH 4th Revision
8	Sand Equivalent Test	IS: 2720, Part 37	1 Test per Source	≥ 50%	MoRT&H Clause 507.2.3
9	Plasticity Index	IS: 2720, Part 5	1 Test per Source	≥ 4%	MoRT&H Clause 507.2.3
10	Polished Stone Value	BS: 812, Part 114	1 Test per Source	≥ 55%	MoRT&H Table 500-14 MORTH 4th Revision
11	Marshall Stability	AASHTO: T 245	3 Marshall moulds for each 400 tonnes of mix subject to minimum of two Tests per day per plant	For, Viscosity Grade, 8.2 KN For, Modified Bitumen (Hot Climate), 12.0 KN	MoRT&H Table 500-16 Morth 5th Revision
12	Marshall Flow	AASHTO: T 245		For, Viscosity Grade, 2-4 mm For, Modified Bitumen (Hot Climate), 2.5-4 mm	
13	Marshall Density	MS-2		-	
14	% Air Voids	MS-2		3 - 5 %	
15	% Voids Filled with Bitumen (VFB)	MS-2		65 - 78 %	
16	% Voids in Mineral Aggregat (VMA)	MS-2		Depend on % Air Voids	MoRT&H Table 500-12
17	Maximum Specific Gravity	ASTM: D 2041	1 Test per Day	-	-
18	Water Sensitivity of mix (Retained Tensile Strength)	AASHTO: T 283	1 Test per Source	≥ 80%	MoRT&H Table 500-14 MORTH 4th Revision
19	Retained Stability	ASTM: D1075	1 Test per Source	For Hot Climate, ≥ 90.0 % For Cold Climate, ≥ 95.0 % For High Rainfall, ≥ 100.0 %	IRC SP: 53
20	Temperature of binder in boiler, aggregate in dryer and mix at the time of laying and compaction.	-	At regular intervals		
21	Binder Content	IRC: SP 11	1 Set per 400 MT or Min. 2	-	-
22	Rate of spread of Mixed Material	-	After every 5th truck load	-	-
23	Density of Compacted Layer by Core Cutting	ASTM: D 2726	1 Test per 700 m2	≥ 92% of Theo. Gmm	MoRT&H Clause 507.3.5

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S. No	Name Of Test	Test Code Reference	Test Frequency	Acceptance Criteria	Acceptance Criteria Reference
24	Density of Compacted Layer by NDG	ASTM: D6938-08a	2 Test per 700 m2	≥ 92% of Theo. Gmm	MoRT&H Clause 507.3.5
15) Dry Lean Concrete (DLC), MoRT&H Section 601 & IRC SP 49-2014					
1	Gradation of Aggregate (Individual)	IS: 2386 : Part 1	1 test per Day	-	-
	Gradation of Aggregate (Combined)	IS: 2386 : Part 1	1 test per Day	As per MoRT&H Table 600-1	MoRT&H Table 600-1
2	Strength of Concrete	IS: 516	3 Samples per 1000sqm	≥ 10 Mpa @ 7 Days	MoRT&H Clause 601.3.4
3	Field Compaction Test (By Sand Replacement Method)	IS: 2720 : Part 28	3 Density holes per 2000sqm	≥ 98%	MoRT&H Clause 601.6.5
16) Pavement Quality Concrete (PQC), MoRT&H Section 602 & IRC 15-2017 and IRC 44-2017					
1	Gradation of Coarse Aggregate (Individual)	IS: 2386 : Part 1	1 test per Day	Depend on Grading Type	MoRT&H Table 600-3
	Gradation of Aggregate (Combined)	IS: 2386 : Part 1	1 test per Day	Depend on Grading Type	MoRT&H Table 600-3
2	Deleterious Materials	IS: 2386 : Part 2	1 test per Source	As per MoRT&H Table 600-2	MoRT&H Table 600-2
3	Water Absorption	IS: 2386 : Part 3	1 test per Source	≤ 2%	MoRT&H Clause 602.2.6.2
4	Moisture Content Test	ASTM: C566	1 test per Day	-	-
5	Los Angeles Abrasion Test	IS: 2386 : Part 4	1 test per Source	≤ 35%	MoRT&H Clause 602.2.6.2
6	Combined Flakiness & Elongation	IS: 2386 : Part 1	1 test per Week	≤ 35%	MoRT&H Clause 602.2.6.2
8	Soundness of aggregates	IS: 2386 : Part 5	1 test per Source	Loss of Weight after 5 cycles tested with : (i) Sodium Sulphate ≤ 12% (ii) Magnesium Sulphate ≤ 18%	MoRT&H Clause 602.2.6.2
7	Sand Equivalent Test	IS: 2720 : Part 37	1 test per Source	≥ 50%	MoRT&H Clause 602.2.6.3
9	Compressive Strength of Concrete	IS: 516	2 cubes and 2 beams per 150 cu.m or part of or minimum 6 cubes and 6 beams (3 for 7 days & 3 for 28 days)	As per Design Requirement	Table-900-6
10	Flexural Strength	IS: 516		As per Design Requirement	Table-900-6
11	Core Strength	IS: 516		≥ 85% of characteristic strength	MoRT&H Clause 602.11.5.4 & Table-900-6
12	Workability of Concrete	IS: 1199	One test for each load at both Batching plant site and paving site	25 ± 15 mm	MoRT&H Clause 602.3.4.2
17) Aggregates for Cement Concrete Works, MoRT&H Section 1000 & IS-383-2016					
1	Gradation of Coarse Aggregate (Individual)	IS: 2386 : Part 1	1 test per Day	Depend on Grading Type	IS: 383 : 2016
2	Gradation of Fine Aggregate (Individual)	IS: 2386 : Part 1	1 test per Day	Depend on Grading Type	IS: 383 : 2016
3	Gradation of Aggregate (Combined)	IS: 2386 : Part 1	1 test per Day	Depend on Grading Type	IS: 383 : 2016
4	Moisture Content Test	ASTM: C566	1 test per Day	-	-
5	Deleterious Constituents	IS: 2386 : Part 2	1 test per Source	As per IS: 383 : 2016	IS: 383 : 2016
6	Combined Flakiness and Elongation Index	IS: 2386 : Part 1	1 test per Day	≤ 40%	IS: 383 : 2016
7	Aggregate Crushing Value	IS: 2386 : Part 4	1 test per Source	≤ 30%	IS: 383 : 2016
8	Aggregate Impact Value	IS: 2386 : Part 4	1 test per Day	≤ 45%	IS: 383 : 2016
9	Los Angeles Abrasion Test	IS: 2386 : Part 4	1 test per Source	≤ 50%	IS: 383 : 2016
10	Soundness of Fine aggregates	IS: 2386 : Part 5	1 test per Source	Loss of Weight after 5 cycles tested with : (i) Sodium Sulphate ≤ 10% (ii) Magnesium Sulphate ≤ 15%	IS: 383 : 2016
11	Soundness of Coarse aggregates	IS: 2386 : Part 5	1 test per Source	Loss of Weight after 5 cycles tested with : (i) Sodium Sulphate ≤ 12% (ii) Magnesium Sulphate ≤ 18%	IS: 383 : 2016

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S. No	Name Of Test	Test Code Reference	Test Frequency	Acceptance Criteria	Acceptance Criteria Reference
12	Alkali Aggregate Reactivity (CA & FA)	IS: 2386 : Part 7	1 test per Source	-	-
13	Specify Gravity & Water Absorption	IS: 2386 : Part 3	1 test per Source	-	-

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S. No	Name Of Test	Test Code Reference	Test Frequency	Acceptance Criteria	Acceptance Criteria Reference
18) Cement, IS : 269 : 2015					
1	Fineness by Dry Sieving	IS: 4031 : Part 1	1 test per Week	Depend on Cement Type/Grade	IS : 269 : 2015
2	Consistency test	IS: 4031 : Part 4	1 test per Week		IS : 269 : 2015
3	Initial and Final Setting Time	IS: 4031 : Part 5	1 test per Week		IS : 269 : 2015
4	Soundness	IS: 4031 : Part 3	1 test per Week		IS : 269 : 2015
5	Compressive Strength	IS: 4031 : Part 6	1 test per Week		IS : 269 : 2015
6	Fineness by Blaine Air Permeability Method	IS: 4031 : Part 2	1 test per Week		IS : 269 : 2015
7	Chemical Test	IS: 4032	1 test per Source		IS : 269 : 2015
19) Cement Concrete Works					
1	Hardened Concrete — Methods of Test	IS: 516 : Part 1 to Part 12	1 to 5 m³ - 1 sample, 6 to 15 m³ - 2 samples, 16 to 30 m³ - 3 samples, 31 to 50 m³ - 4 samples, 51 m³ and above - 4 + 1 additional sample for each additional 50 m³ or part thereof	Minimum Characteristic Strength	MoRT&H Table 1700-1 & Table-1700-9
2	Fresh Concrete — Methods of Sampling, Testing and Analysis	IS: 1199 : 2018 (Part-1 to Part-7)	One test for each load at both Batching plant site and pouring site	As per Design/Site Requirement	-
20) Cement Concrete Chemical Admixture, IS 9103-1999 & MoRT&H Section 1012					
1	Physical Requirements	IS: 9103	1 Test per Source	As per IS: 9103 Table 1A	IS: 9103 Table 1A
2	Chloride Content	IS: 6925	As Required	≤ 0.20 %	MoRT&H Clause 1012.3.2
3	Dry Material Content	IS: 9103	As Required	Within 3% of the value stated by the manufacturer.	MoRT&H Clause 1012.3.2
4	Ash content	IS: 9103	As Required	Within 1% of the value stated by the manufacturer	MoRT&H Clause 1012.3.2
5	Relative Density (for liquid admixtures)	IS: 9103	As Required	Within 2% of the value stated by the manufacturer	MoRT&H Clause 1012.3.2
6	pH	IS: 9103	As Required	-	IS: 9103 Table 2
21) Reinforcement/Untensioned Steel, IS 1786-2008, IS 432 Part- 1 & MoRT&H Section 1009					
1	Carbon	IS: 228	1 test per Lot for each Dia.	Depend on Steel grade	IS : 432 / IS: 1786
2	Sulphur	IS: 228	1 test per Lot for each Dia.	Depend on Steel grade	IS : 432 / IS: 1786
3	Phosphorus	IS: 228	1 test per Lot for each Dia.	Depend on Steel grade	IS : 432 / IS: 1786
4	Sulphur and Phosphorus	IS: 228	1 test per Lot for each Dia.	Depend on Steel grade	IS : 432 / IS: 1786
5	0.2 percent proof stress/ yield stress	IS: 1608 Part 1	1 test per Lot for each Dia.	Depend on Steel grade	IS : 432 / IS: 1786
6	Elongation	IS: 1608 Part 1	1 test per Lot for each Dia.	Depend on Steel grade	IS : 432 / IS: 1786
7	Tensile Strength	IS: 1608 Part 1	1 test per Lot for each Dia.	Depend on Steel grade	IS : 432 / IS: 1786
8	TS/YS ratio	IS: 1608 Part 1	1 test per Lot for each Dia.	Depend on Steel grade	IS : 432 / IS: 1786
9	Bend Test	IS: 1599-2019	1 test per Lot for each Dia.	Depend on Steel grade	IS : 432 / IS: 1786
10	Re - Bend Test	IS: 1786-2008	1 test per Lot for each Dia.	Depend on Steel grade	IS : 432 / IS: 1786
22) Water, IS 456-2000 & MoRT&H Section 1010					

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S. No	Name Of Test	Test Code Reference	Test Frequency	Acceptance Criteria	Acceptance Criteria Reference
1	Neutralize 100 ml sample of water, using phenolphthalein as an	IS:3025, Part 22	1 test per Source	≤ 5 ml of 0.02 normal NaOH	IS 456 Clause 5.4 & MoRT&H Clause 1010
2	Neutralize 100 ml sample of water, using mixed	IS:3025, Part 23	1 test per Source	≤ 25 ml of 0.02 normal H_2SO_4	IS 456 Clause 5.4 & MoRT&H Clause 1010
3	Organic	IS:3025, Part 18	1 test per Source	200 mg/lit	IS 456 Clause 5.4 & MoRT&H Clause 1010
4	Inorganic	IS:3025, Part 18	1 test per Source	3000 mg/lit	IS 456 Clause 5.4 & MoRT&H Clause 1010
5	Sulphates (SO)	IS:3025, Part 28	1 test per Source	400 mg/lit	IS 456 Clause 5.4 & MoRT&H Clause 1010
6	Chlorides (Cl)	IS:3025, Part 32	1 test per Source	2000 mg/lit for concrete work not containing embedded steel and 500 mg/lit for prestressed/reinforced concrete	IS 456 Clause 5.4 & MoRT&H Clause 1010
7	Suspended matter	IS:3025, Part 17	1 test per Source	2000 mg/lit	IS 456 Clause 5.4 & MoRT&H Clause 1010
8	pH value		1 test per Source	≥ 6	IS 456 Clause 5.4 & MoRT&H Clause 1010
23) Structural Steel, IS 2062-2011, MoRT&H Section 1000 Clause 1009.6					
1	Carbon	IS: 228	1 test per Lot	Depend on Steel grade	IS: 2062
2	Manganize	IS: 228	1 test per Lot	Depend on Steel grade	IS: 2062
3	Sulphur	IS: 228	1 test per Lot	Depend on Steel grade	IS: 2062
4	Phosphorus	IS: 228	1 test per Lot	Depend on Steel grade	IS: 2062
5	Silicon	IS: 228	1 test per Lot	Depend on Steel grade	IS: 2062
6	Carbon Equivalent	IS: 228	1 test per Lot	Depend on Steel grade	IS: 2062
7	Tensile Strength	IS: 1608 Part 1	1 test per Lot	Depend on Steel grade	IS: 2062
8	Yield Stress	IS: 1608 Part 1	1 test per Lot	Depend on Steel grade	IS: 2062
9	Elongation	IS: 1608 Part 1	1 test per Lot	Depend on Steel grade	IS: 2062
10	Bend Test	IS: 1599-2019	1 test per Lot	Depend on Steel grade	IS: 2062
11	Impact test	IS: 1757	1 test per Lot	Depend on Steel grade	IS: 2062
24) Hume Pipe. IS 458-2021 & MoRT&H Section 1013					
1	Reinforcement	IS: 458	IS: 458, Table 22	Depend upon Dia. Of Pipes	IS: 458
2	Dimension				
2.i	Diameter	IS: 458	IS: 458, Table 22	Depend upon Dia. Of Pipes	IS: 458
2.ii	Barrel Wall Thickness	IS: 458	IS: 458, Table 22	Depend upon Dia. Of Pipes	IS: 458
2.iii	Length	IS: 458	IS: 458, Table 22	$\pm 1\%$ of Standard Length	IS: 458
3	Hydrostatic Pressure	IS: 458	IS: 458, Table 22	Depend upon Dia. Of Pipes	IS: 458
4	Three Edge Bearing Test	IS: 458	IS: 458, Table 22	Depend upon Dia. Of Pipes	IS: 458
5	Permeability test.	IS: 458		Depend upon Dia. Of Pipes	IS: 458
25) Mineral Admixture (Flyash)					
1	$SiO_2 + Al_2O_3 + Fe_2O_3$	IS: 1727	As required	As per Table 1	IS: 3812, Part 1
2	SiO_2	IS: 1727	As required	As per Table 1	IS: 3812, Part 1
3	Reactive Silica	IS: 3813, Part 1	As required	As per Table 1	IS: 3812, Part 1
4	MgO	IS: 1727	As required	As per Table 1	IS: 3812, Part 1
5	Total Sulpharas SO_3	IS: 1727	As required	As per Table 1	IS: 3812, Part 1
6	Available alkalis as Na_2O	IS: 4032	As required	As per Table 1	IS: 3812, Part 1
7	Total Chlorides	IS: 12423	As required	As per Table 1	IS: 3812, Part 1
8	Loss on ignition	IS: 1727	As required	As per Table 1	IS: 3812, Part 1
9	Fineness by Blaine Air Permeability Method	IS: 4031, Part 2	As required	As per Table 2	IS: 3812, Part 1
10	Particles Retained on 45 micron Sieve (wet sieving)		As required	As per Table 2	IS: 3812, Part 1
11	Lime Reactivity	IS: 1727	As required	As per Table 2	IS: 3812, Part 1

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S. No	Name Of Test	Test Code Reference	Test Frequency	Acceptance Criteria	Acceptance Criteria Reference
12	Compressive Strength at 28 Days	IS: 4031, Part 6	As required	As per Table 2	IS: 3812, Part 1
13	Soundness by autoclave test, Expansion of specimen	IS: 4031, Part 3	As required	As per Table 2	IS: 3812, Part 1