

<b>Laboratory</b>	<b>Mananda Test House, Dhanauni Road, Derabassi, Distt. Mohali, Punjab</b>		
<b>Accreditation Standard</b>	<b>ISO/IEC 17025: 2005</b>		
<b>Discipline</b>	<b>Mechanical Testing</b>	<b>Issue Date</b>	<b>05.09.2014</b>
<b>Certificate Number</b>	<b>T-1455</b>	<b>Valid Until</b>	<b>04.09.2016</b>
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<b>S.No.</b>	<b>Product / Material of Test</b>	<b>Specific Test Performed</b>	<b>Test Method Specification against which tests are performed</b>	<b>Range of Testing / Limits of Detection</b>
<b>I. MECHANICAL PROPERTIES OF MATERIAL</b>				
<b>1.</b>	<b>(Ferrous &amp; Nonferrous)</b>	Weight per meter	IS: 1786-2008 (RA 2013) IS: 2062-2011	0.08 to 100kg
		Tensile strength	IS: 1608:2005 (RA 2011)	50 to 1000 N/mm <sup>2</sup>
		Yield strength	IS: 1608:2005 (RA 2011)	50 to 800 N/mm <sup>2</sup>
		Elongation	IS: 1608:2005 (RA 2011)	5 to 50%
		Bend test	IS: 1599:2012	Mandrel dia 4-240mm
		Rebend test	IS: 1786:2008 (RA2013)	Mandrel dia 16-288mm
<b>2.</b>	<b>Welded material</b>	Tensile strength	IS: 7307: 1974 (RA 2003) & ASME Sec-IX: 2013	50 to 1000 N/mm <sup>2</sup>
		Bend tests	IS: 7307: 1974 (RA 2003) & ASME Sec-IX: 2013	Mandrel dia 4-240mm
<b>II. BUILDING MATERIALS</b>				
<b>1.</b>	<b>Cement</b>	Fineness	IS: 4031(Pt-1): 1996 (RA 2011)	0.1 to 20%
		-Dry Sieving	IS: 4031(Pt-2): 1999 (RA 2013)	100 to 450m <sup>2</sup> /kg
		-Blaine air permeability		
		Soundness		
		-Le-chatelier	IS: 4031(Pt-3): 1988 (RA 2014)	0.5 to 15mm
		-Auto clave	IS: 4031(Pt-3): 1988 (RA 2014)	0.01 to 2%
		Setting time (Initial & final)	IS: 4031(Pt-5): 1988 (RA 2014)	5 to 800 minutes
		Compressive strength	IS: 4031(Pt-6): 1988 (RA 2014)	10 to 80 MPa
		Consistency	IS: 4031(Pt-4): 1988 (RA 2014)	10 to 40%
		Density	IS: 4031(Pt-11): 1988 (RA 2014)	1.5 to 3.5
<b>2.</b>	<b>Bricks</b>	Dimensions	IS: 1077: 1992 (RA 2011)	10 to 5000 mm
		Compressive strength	IS: 3495 (Pt-1)-1992 (RA 2011)	3.5 to 35MPa
		Water absorption	IS: 3495 (Pt-2)-1992 (RA 2011)	2 to 40%
		Efflorescence	IS: 3495 (Pt-3)-1992 (RA 2011)	Qualitative

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<b>3.</b>	<b>Aggregate Coarse &amp; Fine</b>	Sieve analysis -Coarse agg. -Fine agg. Impact value Crushing value Flakiness index Elongation index Abrasion value Specific gravity & Water absorption Bulk density Soundness Deleterious material 10% fine value Organic impurities	IS: 2386 (Pt-I): 1963 (RA 2011)  IS: 2386 (Pt-IV): 1963 (RA 2011) IS: 2386 (Pt-IV): 1963 (RA 2011) IS: 2386 (Pt-I): 1963 (RA 2011) IS: 2386 (Pt-I): 1963 (RA 2011) IS: 2386 (Pt-IV): 1963 (RA 2011) IS: 2386 (Pt-III): 1963 (RA 2011) IS: 2386 (Pt-III): 1963 (RA 2011) IS: 2386 (Pt-III): 1963 (RA 2011) IS: 2386 (Pt-V): 1963 (R 2011) IS: 2386 (Pt-II): 1963 (RA 2011) IS: 2386 (Pt-4): 1963 (RA 2011) IS: 2386 (Pt-2)-1963 (RA 2011)	0.1 to 100% 0.1 to 100% 5 to 60% 5 to 50% 1 to 50% 1 to 50% 5 to 60 % 1.5 to 3.50g/cc & 0.1 to 10% 1400 to 2200 kg/m <sup>3</sup> 0.1 to 30 % 0.02 to 50% 50 to 400 kN Qualitative
<b>4.</b>	<b>Concrete</b>	Compressive strength Slump	IS: 516-1959 (RA 2013) IS: 1199-1959 (RA 2013)	10 to 75 MPa 5.0 to 300mm
<b>5.</b>	<b>Paver block</b>	Dimensions Compressive strength Water absorption	IS: 15658-2006 (RA 2011) IS: 15658-2006 (RA 2011) IS: 15658-2006 (RA 2011)	10 to 300mm 3 MPa to 70MPa 0.5 to 15%
<b>6.</b>	<b>Chequered cement concrete tiles</b>	Dimension (Length, Width & Thickness) Flatness of the tile surface Perpendicularity Straightness Water absorption Thickness of wearing layer Resistance to wear Wet Transverse Strength	IS: 13801-2013 IS: 13801-2013 IS: 13801-2013 IS: 13801-2013 IS: 13801-2013 IS: 13801-2013 IS: 13801-2013 IS: 13801-2013	10 to 350mm 0.05 to 1mm 0 to 3% 0 to 3% 1 to 30% 1 to 15mm 1 to 15mm 1 to 10 N/mm <sup>2</sup>

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7.	<b>Cement concrete flooring tiles (Plain cement/Plain colored/Terrazzo)</b>	Dimension (Length, Width & Thickness)	IS: 1237-2012	10 to 350mm
		Flatness of the tile surface	IS: 1237-2012	0.05 to 1mm
		Perpendicularity	IS: 1237-2012	0 to 3%
		Straightness	IS: 1237-2012	0 to 3%
		Water absorption	IS: 1237-2012	1 to 30%
		Thickness of wearing layer	IS: 1237-2012	1 to 15mm
		Resistance to wear	IS: 1237-2012	1 to 15mm
		Wet Transverse Strength	IS: 1237-2012	1 to 10 N/mm <sup>2</sup>
8.	<b>Fly ash/ Pozzolanic material</b>	Fineness (By Blaine air permeability)	IS: 1727-1967 (RA 2013)	100 to 800m <sup>2</sup> /kg
		Soundness by Autoclave	IS: 4031 (Pt-3)-1988 (RA 2014)	0.001 to 2%
		Density	IS: 4031(Pt-11): 1988 (RA 2014)	1 to 3g/cc
		Particle retained on 45 micron	IS: 1727-1967 (RA 2013)	1 to 70%
<b>III. SOIL AND ROCK</b>				
1.	<b>Soil, Granular material &amp; Bentonite clay</b>	Liquid limit	IS: 2720 (Pt-5): 1985 (R 2010)	20 to 500%
		Plastic limit	IS: 2720 (Pt-5): 1985 (R 2010)	0 to 300%
		Plasticity index	IS: 2720 (Pt-5): 1985 (R 2010)	1 to 200%
		Light compaction test MDD/OMC	IS: 2720 (Pt-7): 1980 (R 2011)	1.0 to 3 g/cc 4 to 20 %
		Heavy compaction test MDD/OMC	IS: 2720 (Pt-8): 1983 (RA 2010)	1.0 to 3 g/cc 4 to 20%
		CBR (Soaked)	IS: 2720 (Pt-16): 1987 (RA 2011)	0.2 to 80%
		Water content	IS: 2720 (Pt-2)-1973 (RA 2010)	1.0 to 30%
		Specific gravity (fine graind)	IS: 2720 (Pt-3)-1980 (RA 2011)	1.5 to 3.0
		Grain size distribution (4.75mm to 0.002mm)	IS: 2720 (Pt-4)-1985 (RA 2010)	0.1 to 100%

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		Unconfined compressive strength	IS: 2720 (Pt-10)-1991 (RA 2010)	0.1 to1 MPa
		Free swell index	IS: 2720 (Pt-40)-1977 (RA 2011)	10.0 to 2500%
		Shrinkage factors	IS: 2720 (Pt-6)-1972 (RA 2011)	10.0 to 50%
		Direct shear test (UU)	IS: 2720 (Pt-13)-1986 (RA 2011)	
		C-value		0.00 to 5.0kg/cm <sup>2</sup>
		φ value		5 to 500

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