



# **APPENDIX – 1**

## **DESIGN STANDARDS AND CODES**



## DESIGN STANDARDS AND CODES

Codes and Standards applicable but not limited to different categories in the Project are as under :

❖ **GENERAL**

Health and Safety Standards according to international norms.

❖ **MECHANICAL**

Materials according to ASTM

Pressure vessels and heat exchangers according to ASME and TEMA

Piping according to API.

Tanks as per API.

Pumps and Blowers as per API

Insulation as per DIN

❖ **ELECTRICAL**

NEMA, ASA, NEC, IEEE

IEC Recommendations

IP Electrical Safety Code, Part 1.

❖ **INSTRUMENTATION**

ISA-S 5.1 (1973)

API RP 500

NEMA

The plants shall be equipped with **Distributed Digital Control System (DCS)** based Electronic Control Instrumentation.

**The standards listed above are only given as examples. Other standards, such as the German DIN, the Japanese JIS, etc. may be specified if required or envisaged as alternatives.**



❖ **CIVIL**

Standard Codes applicable in this section for Civil, Structural and other allied works shall include but not limited to the following :

BIS – 109	Ready mixed paint, brushing, priming, plaster to Indian Standard colour No. 631 & 361 white and off-white.
BIS – 12269	53 grade ordinary Portland cement
BIS – 383	Coarse & Fine aggregates from natural sources for concrete.
BIS – 432	Mild Steel & Medium tensile steel bars.
BIS – 456	Code of Practice for Plain and Reinforced Concrete.
BIS – 515	Natural and Manufactured aggregates for use in mass concrete
BIS – 730	Hook bolts for corrugated sheet roofing
BIS – 800	Code of Practice for General Construction in Steel
BIS – 88	Code of practice for structural timber in building.
BIS – 1367	Technical supply conditions for threaded steel fasteners
BIS – 1038	Steel doors, windows and ventilators
BIS – 1079	Hot rolled carbon steel sheets strips
BIS – 1081	Code of practice for fixing and glazing of metal (steel & Aluminium) doors, windows and ventilators.
BIS – 1361	Steel windows for Industrial Buildings.
BIS – 1363	Hexagon head bolts, screws & nuts of product grade C : Part-I Hexagon head bolts (size range M5 to M64)
BIS – 1566	Hard-Drawn steel wire fabric for concrete reinforcement.
BIS – 1786	High strength deformed steel bars wires for concrete reinforcement.
BIS – 2062	Steel for general structural purposes.
BIS – 2116	Sand for masonry mortars.
BIS – 2212	Code of practice for brick work.
BIS – 2386	Methods of test for aggregates.
BIS – 2553	Safety glass : Part-I General purpose.
BIS – 2835	Flat transparent sheet glass



BIS – 3007	Code of practice for laying of asbestos cement sheets.
BIS – 4021	Timber door, window and ventilator frames
BIS – 4925	Concrete batching and mixing Plant
BIS – 5410	Cement Paint
BIS – 10262	Recommended guidelines for concrete mix design.
IS : 45	Code of practice for plain & reinforced concrete
IS : 800	Code of practice for general construction in steel
IS : 801	Code of practice for use of cold formed light gauge steel structural members in general building construction.
IS : 802	Code of practice for use of structural steel in overhead transmission line towers
IS : 816	Code of practice for use of metal arc welding for general construction
IS : 875	Code of practice for design loads.
IS : 1080	Code of practice for design & construction of shallow foundations on soil
IS : 1597	Code of practice for construction of stone masonry
IS : 189	Criteria for earthquake resistant design of structures
IS : 1904	Code of practice for design and construction of foundations in soils, General requirements
IS : 1905	Code of practice for structural use of un-reinforced masonry
IS : 218	Concrete masonry units
IS : 2911	Code of practice for design and construction of pile foundations
IS : 2950	Code of practice for design & construction of raft foundations
IS : 2974	Code of practice for design & construction of machine foundations
IS : 3370	Code of practice for concrete structures for storage of liquids
IS : 4091	Code of practice for design and construction of foundation for transmission line tower and poles
IS : 4326	Code of practice for earthquake resistant design and construction of buildings
IS : 4925	Specification for Concrete Batching And Mixing Plant
IS : 5249	Determination of dynamic properties of soil
IS : 8009	Code of practice for calculation of settlements of foundations
IS : 11089	Code of practice for design and construction of ring foundation
IS : 13920	Code of practice for ductile detailing of reinforced concrete structures subjected to seismic forces.



❖ **ROADS AND PAVEMENTS**

Standard Codes applicable in this section for Roads and Pavements shall include but not limited to the following :

IS 73 - 1992	:	Specification for paving bitumen.
IS 215 - 1995	:	Specification for road tar.
IS 217 - 1988	:	Specification for cutback bitumen.
IS 1200 (Part-I) 1992	:	Method of measurement of building and civil engineering works : (Part-I Earthwork).
IS 1200 (Part-17) 1985	:	Method of measurement of building and civil engineering works : Part-17 Road work including air field pavements.
IS 2386 (Part-I) 1963	:	Methods of test for aggregate of concrete : Part-I : Particle size and shape.
IS 2386 (Part-3) 1963	:	Methods of test for aggregate of concrete : Part-3 : Specific gravity, density, voids, absorption and bulking.
IS 2386 (Part-4) 1963	:	Methods of test for aggregate of concrete : Part-4 : Mechanical properties.
IS 2430 - 1986	:	Methods of sampling of aggregate for concrete.
IS 2720 (Part-2) 1973	:	Methods of test for soils : Part-2 : Determination of moisture content.
IS 2720 (Part-5) 1985	:	Methods of test for soils : Part-5 : Determination of liquid and plastic limit.
IS 2720 (Part-8) 1983	:	Methods of test for soils : Part-8 : Determination of moisture content – dry density relation using heavy compaction.
IS 2720 (Part-28) 1974	:	Methods of test for soils : Part-28 : Determination of dry density of soils, in place, by the sand Replacement Method.
IS 2720 (Part-29) 1975	:	Methods of test for soils : Part-29 : Determination of dry density of soils, in place by core cutter method.
IS 6241 - 1971	:	Methods of test for determination of stripping value of road aggregate.
IS 6579 - 1981	:	Specification for coarse aggregates for water bound macadam.