

Chapter 2

Codes and Standards



Indian Plumbing Association

Codes and Standards

This presentation will cover key provisions of codes & standards for public health engineering, published by the Bureau of Indian standards (BIS) and other organizations.

Codes or Standards are published technical documents that represent industry consensus on how a material or assembly is to be designed, manufactured, tested, installed or maintained so that a specific level of performance is obtained.

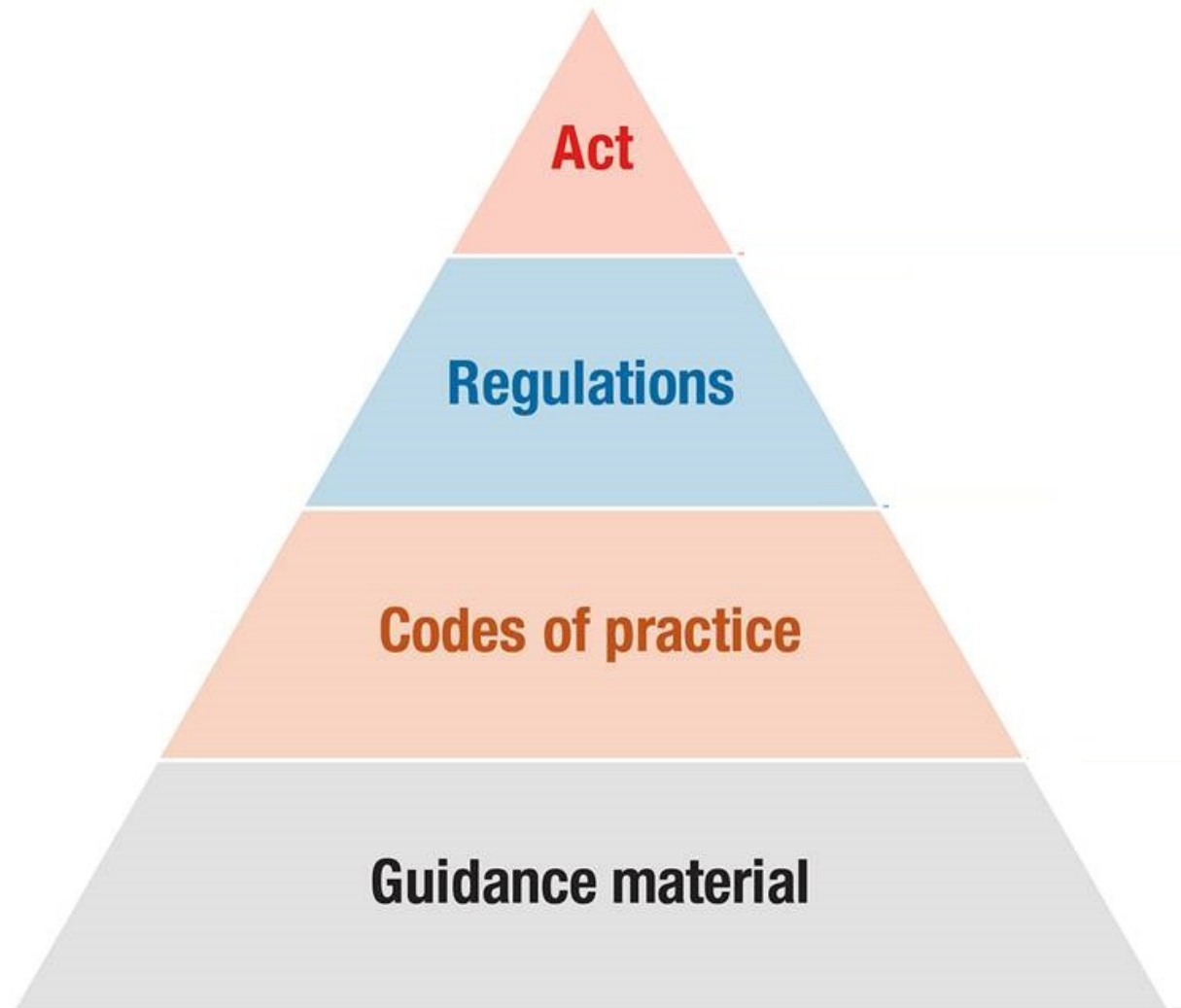
Codes and Standards

- Standards are benchmark of min. quality.
- Conformity & Competitiveness
- Globalization of Trade & Commerce
- Globally acceptable standards?
- Imports and exports made easy
- Ease in technology transfer

Standards

- Voluntary
NBC 2016 Part IX, UIPC-I 2017
- Special Publications SP 35 : 1987
Handbook on Water Supply & Drainage
- Mandatory
NBC Part IV - Fire, other standards for materials
- Local
DC Rules of AHJ, MPL Councils

Some International Definitions



The Act is the formal, broad description of the law, setting out the key principles, duties, obligations and rights for each duty holder in relation to Work Health and Safety. It includes the power to create regulations.

Regulations support the Act, providing more detailed information about duties in relation to particular hazards, procedures and WHS obligations.

Regulations are still subject to Parliamentary scrutiny, but are more readily adaptable to changes or special circumstances than the Act.

Codes of practice provide guidance to operators to meet their 'duty of care' responsibilities.

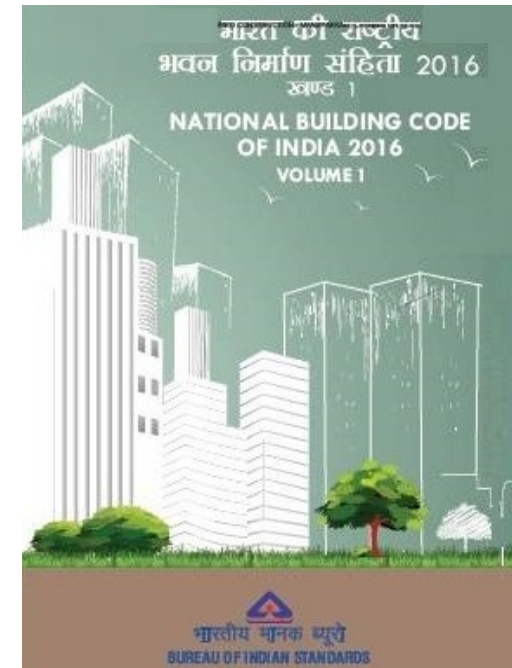
Codes of practice are not legally binding, but are admissible in Courts as evidence.

If duty holders choose not to follow a code of practice, they need to have a better system and provide justification.

- BIS - 'Bureau of Indian Standards' is a mandated agency for Indian National Standards.
- BIS has published codes and standards for various aspects of plumbing and sanitation viz
 - Design assumptions and planning,
 - Material specifications, and
 - Installation guidelines
- This presentation covers only the codes and standards that relate to design and planning of plumbing and sanitation systems.



- The National Building Code of India (NBC), a comprehensive building Code published by 'Bureau of Indian Standards', is a national instrument providing guidelines for regulating building construction activities across the country.
- It serves as a model code for adoption by all agencies involved in building construction.



IPA and IAPMO-I

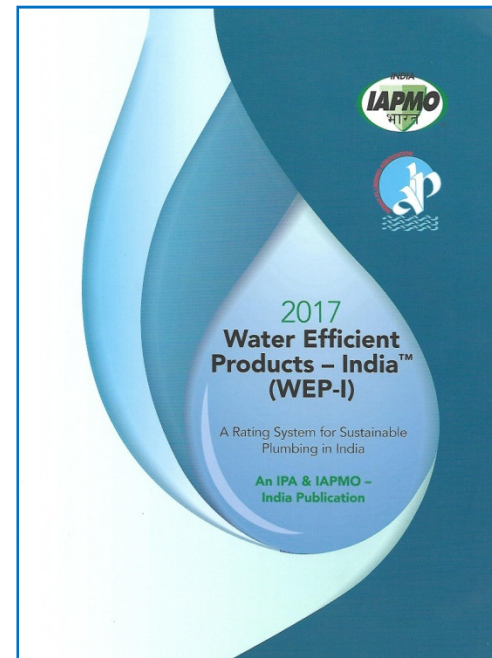
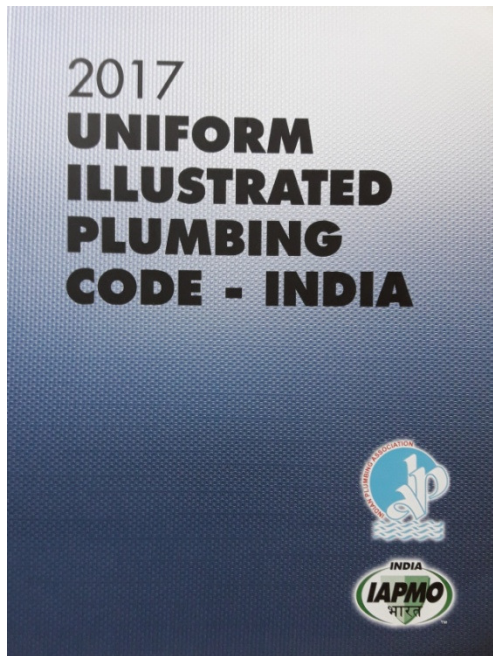
- Indian Plumbing Association (IPA) jointly with International Association of Plumbing and Mechanical Officials, India (IAPMO-I) has published several codes relating to Plumbing.
- 2017 Uniform Illustrated Plumbing Code-India (UIPC-I)
- 2017 Water Efficient Products-India (WEP-I)
- 2013 Green Plumbing Code Supplement-India (GPCS-I)
- 2012 Uniform Solar Energy Code-India (USEC-I)
- 2011 Uniform Swimming Pools Code-India (USPC-I)



Indian Plumbing Association

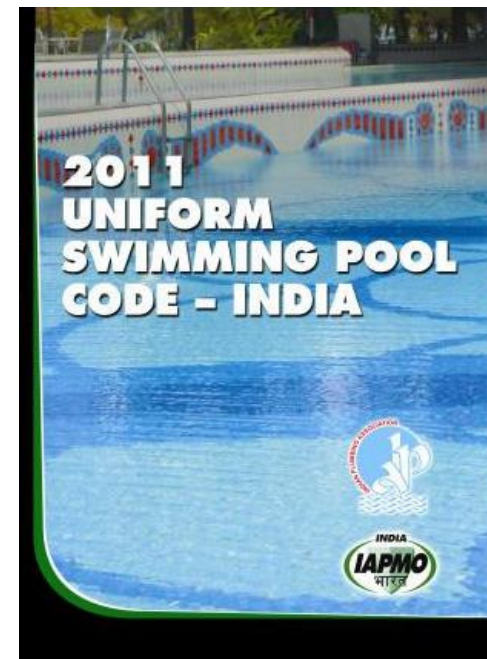
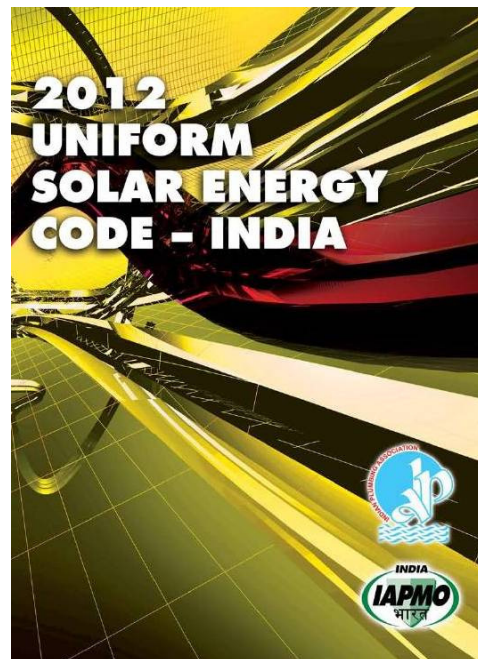
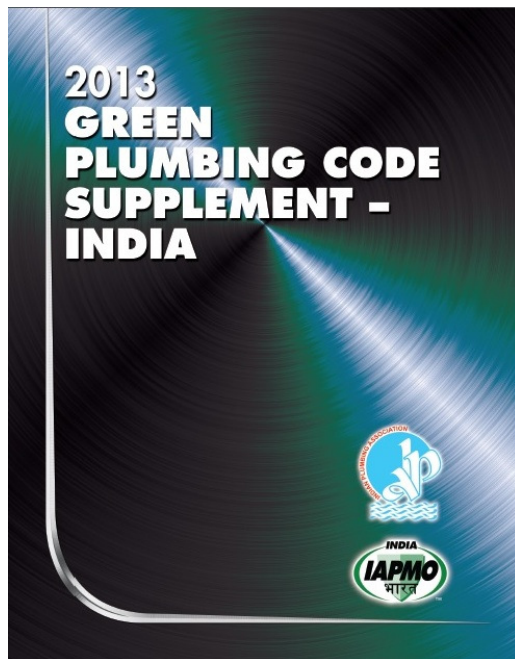


IPA and IAPMO-I



Indian Plumbing Association

IPA and IAPMO-I



- Since India is a vast country, the local development control rules are expected to cover region specific needs of the subject.
- Hence possibility of some deviations in the national standard and local **development control** rules cannot be denied.
- Further, some deviation is possible in the codes published by BIS and **IPA-IAPMO**.
- **Discretion of Participants is important in this aspect.**

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Standard	Year	Title
IS:10446	2007	Glossary of terms relating to water supply and sanitation
IS:1172	2007	Code of Basic Requirements for Water Supply, Drainage and Sanitation
IS:1742	1983	Code of practice for building drainage
IS:1950	1962	Code of practice for sound insulation of non-industrial buildings
IS:2064	2007	Code of practice for selection, installation and maintenance of sanitary appliances

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Standard	Year	Title
IS:2065	1983	Code of practice for water supply in buildings
IS:5329	1983	Code of practice for sanitary pipe work above ground for building
IS:6295	2007	Code of practice for water supply and drainage in high altitudes and/or subzero temperature regions
IS:7558	1974	Code of practice for domestic hot water installations
IS:10500	2012	Drinking Water
IS:11624	1986	Guidelines for the quality of irrigation water

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Standard	Year	Title
IS:12183	1987	Code of practice for plumbing in multistoried buildings, Part 1: Water supply
IS:12251	1987	Code of practice for drainage of building basements
IS:12976	1990	Solar water heating systems- Code of practice
IS:15797	2008	Roof top rainwater harvesting – Guidelines
SP 7	2016	National Building Code of India 2016

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Standard	Year	Title
CPHEEO Manual	2013	Central Public Health and Environmental Engineering Organization Manual 2013
		Manual on norms and standards for environment clearance of large construction projects, By MOEF
ECBC-2017	2017	Energy Conservation Building Code - 2017
EP Act 1986	1986	Environment protection act 1986

IS:10446 - 2007

Glossary of terms relating to water supply and sanitation

- Number of technical terms in use in the field of water supply and sanitation
- Standardization of terminology
- Covers definitions of the terms

IS:1172 - 2007

Code of Basic Requirements for Water Supply, Drainage and Sanitation

- Requirements of water supply for residences has been listed based on population of the community.
- For Lower Income Group (LIG) and Economical Weaker Section of Society (EWS), the value of minimum requirement of water supply has been retained as 135 litres per head per day.
- Fire demand in buildings has been catered to, by giving reference to a suitable standard.

IS:1172 - 2007

Code of Basic Requirements for Water Supply, Drainage and Sanitation

- This standard lays down basic requirements for water supply, drainage and sanitation for residential, commercial, industrial and other types of buildings in urban areas including railway platforms, bus stations and terminals, seaports, airports and market yards.
- This code represents good practices and, therefore, takes the form of recommendations.

IS:1742 - 1983

Code of practice for building drainage

- Uniformity in the variety of drainage practices followed by various Municipal Corporation, Municipalities and other bodies in the country
- Efficient drainage of surface and subsoil water and sewage from buildings to public sewers.

IS:1950 - 1962

Code of practice for sound insulation of non-industrial buildings

- Guide to the engineers and architects in the field in dealing with noise reduction and sound problems.
- Effect of noise on human comfort
- Annoyance, uncomfortable, fatigue, inefficiency and mental strain
- Prolonged exposure causes temporary deafness or nervous breakdowns.

IS:1950 - 1962

Code of practice for sound insulation of non-industrial buildings

- Based on the data obtained from the experimental work and field studies carried out in certain countries abroad such Britain, Sweden, Holland and Denmark.
- Indoor noises arising out of plumbing installations due to the tenants on the upper or adjacent floor,
- Flushing the fixtures, particularly annoying during the night
- Design of the acoustic barriers
- It is recommended to go through EN 14366

IS:2064 - 2007

Code of practice for selection, installation and maintenance of sanitary appliances

- Proper layout of the fixtures and appliances wastes are suitably disposed off to drains without causing insanitary conditions and nuisance to public.
- Provides details of dimensions necessary for fixing sanitary fixtures and appliances.

IS:2065 - 1983

Code of practice for water supply in buildings

- Minimum standards for the design, layout and workmanship governing water supply in buildings
- Recommends prevention of wastage, misuse, undue consumption and contamination of water, the conservation of which has become an urgent necessity in view of its increasing demand.
- Deals with licensing of plumbers, design of water supply systems, principles of conveyance and distribution of water within the premises, storage, water fittings and appliances, and inspection and maintenance.

IS:5329 - 1983

Code of practice for sanitary pipe work above ground for building

- The requirements for soil pipe, waste pipe and ventilating pipe have also been included.
- Traditional two-pipe system as well as one-pipe and the single stack systems.
- Safeguards for single stack system have been covered in detail.

IS:6295 - 2007

Code of practice for water supply and drainage in high altitudes and/or subzero temperature regions

- Large mountainous regions in the north inhabited by small communities remained unexplored in the past.
- Methods to avoid freezing of water during transmission such as Hessian cloth and asbestos coated lagging ropes are included as insulating material for pipes.
- The principles in planning and designing not very different but require suitable modifications

IS:7558 - 1974

Code of practice for domestic hot water installations

- Hot water supply systems in the colder regions of the country, hotels and other places
- Guidance for design, installation, inspection, etc.
- Good workmanship is essential requirement for compliance with this code.

IS:10500 - 2012

Drinking Water

- Methods of sampling and testing for drinking water.
- Specifies the acceptable limits and the permissible limits in the absence of alternate source.
- If the value exceeds the limits indicated under permissible limit, in the absence of alternate source, the source will have to be rejected.
- Pesticide residues limits based on WHO guidelines

IS:10500 - 2012

Drinking Water

- Limit requirements for ammonia, chloramines, barium, molybdenum, silver, sulphide, nickel, polychlorinated biphenyls and trihalomethanes
- Colour, turbidity, total hardness, free residual chlorine, iron, magnesium, mineral oil, boron, cadmium, total arsenic, lead, polynuclear aromatic hydrocarbons, pesticides and bacteriological requirements.
- Requirement for virological, cryptosporidium and giardia examination have been included.

IS:11624 - 1986

Guidelines for the quality of irrigation water

- Degree of harmful effects on soil properties and crop yield.
- Guidelines for assessing the quality of irrigation water.
- Configuration of treatment processes for reclaimed water.
- Chemical properties such as Salt concentration, Sodium adsorption ratio, Residual sodium carbonate or bicarbonate ion concentration, and Boron content.

IS:12183 - 1987

Code of practice for plumbing in multistoried buildings, Part 1: Water supply

- This code covers general requirements and regulations, design considerations, plumbing systems, distribution system, storage of water and inspection for water supply in multi-storied buildings.

IS:12251 - 1987

Code of practice for drainage of building basements

- Basements for parking, plant room, garbage chute, common toilets or other utility purposes.
- Air-conditioners, water heaters, stores, offices in hotels and theatres.
- Covers methods for basement drainage both for sewage and storm water.

IS:12976 - 1990

Solar water heating systems - Code of practice

- Mainly of three components - solar collector, storage tank and connecting pipes.
- Other components - heat exchangers, circulating pumps and measuring instruments.
- Covers solar water heating systems with flat plate or tubular collectors and their performance evaluation methods.
- Provides the principles of corrosion, anti-freeze and overheating protection of the system.

IS:15797 - 2008

Roof top rainwater harvesting - Guidelines

- Importance of rainwater harvesting.
- Includes collection, storage and usage of rainwater.
- Augmenting ground water storage .
- Factors Determining Type of Rainwater Harvesting System
 - Rainfall Quantity
 - Rainfall Pattern
 - Collection Area
 - Storage Capacity

SP7: 2016

National Building Code 2016

- Regulations for by various departments, municipal administrations and public bodies.
- Safety of the public with regard to structural sufficiency, fire hazards and health aspects of buildings;
- Choice of materials and methods of design and construction are left to the ingenuity of the building professionals.
- Also covers administrative provisions, fire safety, materials, structural design; rules for electrical, lighting, air conditioning and heating, lifts; ventilation, acoustics, plumbing, signs and outdoor display structures etc.

SP7: 2016

National Building Code 2016 PART 9 PLUMBING SERVICES

- Part 9 Section 1 covers water supply in buildings.
- Encompasses public water supply, design of water supply systems, principles of conveyance and distribution of water within the premises, hot water supply system, inspection and maintenance of water supply.

SP7: 2016

National Building Code 2016 PART 9 PLUMBING SERVICES

- Additional definitions universal pipe friction diagram and nomogram of Hazen and Willam's equation for discharge computation.
- Deleted the discharge curves based on Chezy's formula Water supply system for multi-storied buildings.
- Added separate storage for flushing and domestic water.
- Added domestic hot water supply installations.
- Excludes water supply for fire fighting and street cleaning.

SP7: 2016

National Building Code 2016 PART 9 PLUMBING SERVICES

- Part 9 Section 2 deals with Drainage and Sanitation
- Includes drains inside buildings and from the buildings up to the connection to public sewer, private sewage disposal system, or treatment work.
- Covers design, construction and maintenance of drains for surface water, subsoil water and sewage.
- Also covers the new technologies like ceiling hung piping, single stack piping, effect of sound in drainage and newer materials like the HDPE or PP drainage piping materials.

CPHEEO MANUAL: 2013

Central Public Health and Environmental Engineering Organization Manual 2013

- CPHEEO Manual on Water Supply and Waste water treatment to provide guidelines to the Public Health and Engineering Department, Water Boards and Municipal bodies.
- It gives latest updates on water quality standards, per capita water supply norms, water conservation, metering and availability of various kinds of pipes etc.

MOEF manual on norms and standards for Environment Clearance of large construction projects

- Ministry of Environment and Forests (MOEF), Government of India.
- Construction activities while giving attention on environmental issues.
- Unplanned and unsustainable urban development in the past
- Modern buildings with high levels of energy consumption.
- The objectives of the Notification - to set procedures of environmental clearance

MOEF manual on norms and standards for environment clearance of large construction projects

- The suitability of site for a proposed development is one of primary concerns
- Separation of grey and black water
- 100 per cent treatment of grey water and reuse
- Rainwater harvesting
- Storm/rain water control and re use

ECBC-2017

Energy Conservation Building Code - 2017

- Minimum requirements for the energy-efficient design and construction of buildings.
- Mandatory for commercial buildings or building complexes that have a connected load of 500 kW or greater or a contract demand of 600 kVA or greater. T
- Also applicable to all buildings with a air conditioned floor area of 1,000 m² (10,000 ft²) or greater.
- Solar water heating for at least 1/5 of the design capacity. Water heating equipment with min. efficiency requirements

EP Act 1986

Environment Protection Act 1986

- Act for Protection and Improvement of Environment and Matters Connected therewith.
- Lays down the guidelines for quality of water expected out of sewage treatment plants for disposal in lakes or river, and for reuse for flushing and gardening etc..

Thank you

- Any Questions?

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