

NATIONAL STANDARD
OF THE PEOPLE'S REPUBLIC OF CHINA
中华人民共和国国家标准

Code for Design of Building Water Supply and Drainage

建筑给水排水设计规范

GB 50015 — 2003

(英文版)

Beijing 2003

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NOTICE

This code is written in Chinese and English. The Chinese text shall be taken as the ruling one in the event of any inconsistency between the Chinese text and the English text.

Bulletin of Ministry of Construction of the People's Republic of China

No. 138

Bulletin of Ministry of Construction of the People's Republic of China Promulgation for the National Standard "Code for Design of Building Water Supply and Drainage"

"Code for Design of Building Water Supply And Drainage" has been approved as a national standard, with a serial number of GB 50015—2003, and it shall come into force upon September 1, 2003. Herein, No. 3.2.1, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.9, 3.2.10, 3.2.14, 3.5.8, 3.9.1, 3.9.3, 3.9.4, 3.9.9, 3.9.12, 3.9.14, 3.9.22, 3.9.24, 3.9.27, 4.2.6, 4.3.5, 4.3.6, 4.3.13, 4.3.19, 4.5.9, 4.8.4, 4.8.8, 5.4.5, 5.4.20 are mandatory clauses, which must be enforced strictly. The original "Code for Design of Building Water Supply and Drainage" GBJ 15—88 shall be abrogated on the same date.

Research Institute of Standards and Norms-Ministry of Construction will organize the China Planning Press to take on publishing and distributing works of this code.

Ministry of Construction of the People's Republic of China
April 15, 2003

Preface

According to the requirements of “Notice of Printing and Distributing for the ‘1998 Preparation and Revision Plan of Engineering Construction Standards’ (Document JB[1998] No. 94)-Ministry of Construction”, that the “Code for the Design of Building Water Supply and Drainage” GBJ 15—88 managed by Shanghai Construction and Management Committee, compiled by Shanghai Xian Dai Architectural Design(Group) Co., Ltd jointly with China Architecture Design & Research Group and Architectural Design and Research Institute of Guangdong Province has been revised completely. In the period of revision, the Code revision group summarized the recent design experience of building water supply and drainage, carried out various studies on major topic, proposed the draft for comments, based on the nation-wide opinions which solicited by the code revision group from specialist, scholar, designer of the Design, the Research and College relevant units, finally, the new version of code was worked out through serious study and analysis.

The major revisions of technology are (1) residential area water supply and drainage design has been added; (2) dwelling and public buildings rated water consumption has been readjusted and added; (3) the measures to prevent pollution in pipe connect have been added; (4) applied technology of new types of pipe has been added; (5) probability formula of calculating second flow of domestic water supply has been adopted; (6) hydraulic calculation of varied types of pipe has been unified; (7) recycle water treatment of aquatic recreation pool has been added; (8) the design for cooling water and recycle water has been added; (9) details of hospital sewage, water supply and drainage for swimming pool expressed in association standards have been deleted, only provisions of principle, safety and sanitation reserved; (10) the provisions on water supply and drainage for production technology have been deleted; (11) the parameter of pressure flow of roof rainwater has been added; (12) applied range for design heat consumption of maximum hour with central hot water supply has been readjusted; (13) calculation of natural cycle hot water pipe system has been deleted; (14) technology essential and parameter of hot water machine set and water heater have been added and (15) relevant contents of fine drinking water pipe system have been added.

The present code may be in need of locally revised in the future, that the relevant informations and contents of locally revised Clauses will be published on the magazine of “Standardization of Engineering Construction”.

Clauses marked with boldface letters in the code are mandatory clauses and must be enforced strictly.

Ministry of Construction is responsible for supervision of the present code and explanation of the mandatory clauses, Shanghai Construction and Management Committee for its specific management and Shanghai Xian Dai Architectural Design (Group) Co., Ltd for its specific explanation. During the process for implementing this code, the relevant opinions and advices, which

can may be available for reference to next revision, can be posted to shanghai Xian Dai Architectual Design(Group) Co. , Ltd(Management Group of National Standand“Code for Design of Building Water Supply and Drainage.”, No. 258 Shi Men Er Lu Modern architectural design edifice, Shanghai, China, Postcode:200041) .

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Contents

1 General Principles	1
2 Terms and Symbols	2
2.1 Terms	2
2.2 Symbols	8
3 Water Supply	11
3.1 Rated water consumption and water pressure	11
3.2 Water quality and water quality pollution protection	15
3.3 System selection	17
3.4 Pipe material, fittings and water meter	18
3.5 Piping layout and pipe laying	22
3.6 Design flow and hydraulic calculation of pipe	24
3.7 Water tower, Water tank, Reservoir	30
3.8 Pressurizing equipment, pump house	32
3.9 Swimming pool and aquatic recreation pool	35
3.10 Cooling tower and circulation cooling water	38
3.11 Waterscape	41
4 Water Drainage	43
4.1 Selection of drainage system	43
4.2 Plumbing fixture and water lock	43
4.3 Pipe location and pipelining	45
4.4 Calculation of drainage pipe	48
4.5 Pipe material, fittings and inspection well	52
4.6 Vent pipe	55
4.7 Sewage pump and catch pit	57
4.8 Small domestic soil disposal	58
4.9 Rainwater	62
5 Hot water and drinking water supply	67
5.1 Rated consumption, temperature and quality of hot water	67
5.2 Selection of hot water supply system	71
5.3 Calculation of heat consumption, hot water quantity and heating equipment hot supply	73
5.4 Water heating and storage	75
5.5 Calculation of network	81
5.6 Pipe, fitting and pipeline laying	82
5.7 Potable water supply	84

Appendix A Residential district underground pipeline (structure) minimum net clearance between lines 87

Appendix B Valves and screw fittings resistance
loss converted length of compensation 88

Appendix C Water supply pipe section Plumbing fixtures water supply equivalent simultaneously outflow probability calculated equation, α_c coefficient values table 89

Appendix D Water supply pipe section designed second flow calculation table 90

Appendix E Fine drinking water number of taps simultaneously use in the calculated pipe section 100

Explanation of wording in this Code 101

目 次

1 总则	107
2 术语、符号	108
2.1 术语	108
2.2 符号	113
3 给水	116
3.1 用水定额和水压	116
3.2 水质和防水质污染	120
3.3 系统选择	121
3.4 管材、附件和水表	121
3.5 管道布置和敷设	124
3.6 设计流量和管道水力计算	126
3.7 水塔、水箱、贮水池	130
3.8 增压设备、泵房	131
3.9 游泳池和水上游乐池	133
3.10 冷却塔及循环冷却水	135
3.11 水景	137
4 排水	139
4.1 系统选择	139
4.2 卫生器具及存水弯	139
4.3 管道布置和敷设	140
4.4 排水管道水力计算	142
4.5 管材、附件和检查井	146
4.6 通气管	148
4.7 污水泵和集水池	149
4.8 小型生活污水处理	150
4.9 雨水	153
5 热水及饮水供应	157
5.1 热水用水定额、水温和水质	157
5.2 热水供应系统选择	160
5.3 耗热量、热水量和加热设备供热量的计算	161
5.4 水的加热和贮存	163
5.5 管网计算	167
5.6 管材、附件和管道敷设	169
5.7 饮水供应	170
附录 A 居住小区地下管线（构筑物）间最小净距	172
附录 B 阀门和螺纹管件的摩阻损失的折算补偿长度	172
附录 C 给水管段卫生器具给水当量同时出流概率计算式， α_c 系数取值表	173
附录 D 给水管段设计秒流量计算表	173
附录 E 饮用净水计算管段上同时使用水嘴的数量	183
本规范用词说明	184

1 General Principles

1.0.1 The code was drawn up for the purpose of ensuring the quality of building water supply and drainage design, set the design to meet the basic requirement of safety, hygiene, applicability, economy.

1.0.2 The code is applicable to the residential area, civil building water supply and drainage design, and also applicable to the industrial building domestic water and drainage and factory roof rain-fall run-off design.

But when design the following projects, current relevant specified code or regulation must be executed:

- 1** Collapsible loess, perennial frozen soil and expansive soil region building.
- 2** Building with anti-seismic intensity more than 9.
- 3** Mineral water cure, civil air defense works.
- 4** Industrial production water supply and drainage.
- 5** Building reclaimed water.

1.0.3 Building water supply and drainage design must meet the application demands and also provide convenience for construction installation, operation management, maintenance inspection and safety protection.

1.0.4 Building water supply and drainage engineering design must conform with the code, in addition, must conform current relevant national standard codes requirement.

2 Terms and Symbols

2.1 Terms

2.1.1 Potable water

Water quality meets portable water hygienic standard apply to usual drinking and washing water.

2.1.2 Non-drinking water

Water not safe for drinking or for personal or culinary use, apply to wash sanitary fixture, vehicle, road sprinkling, irrigate greenbelt, complement air condition circulating water.

2.1.3 Hourly variation coefficient

Ratio between maximum daily maximum hourly water consumption and average hourly water consumption.

2.1.4 Maximum hourly water consumption

Within maximum daily water consumption day time, the maximum water consumption per hour.

2.1.5 Backflow pollution

1 Due to negative pressure in the pipeline, causing a reversal of flow from water storage tank, plumbing fixture liquid mixture back flow water.

2 Due to non-drinking water or other liquid mixture flow into water supply system.

2.1.6 Air gap

1 The vertical space distance between the lowest point of water supply pipeline outlet and the receptor or fixture which water overflows.

2 The vertical space distance between the lowest point of indirect drainage facility or storage outlet and the receptor or fixture which water overflows.

2.1.7 Flood-level rim

The edge of the receptor or fixture which water overflows.

2.1.8 Service pipe, inlet pipe

This pipe from the water main in the street or municipal pipeline of supply to the building served area.

2.1.9 Building unite pipe

Water supply and drainage pipeline laying around the building directly connect with building inlet and outlet pipe.

2.1.10 Inlet pipe

Pipe between water meter in building and out door building unite pipe.

2.1.11 Vertical division block

The building water supply system is vertically divided into a certain number of blocks.

2.1.12 Parallel water supply

Water supply system in vertical division block with parallel distribution pattern.

2.1.13 Series water supply

Water supply system in vertical division block with series distribution pattern.

2.1.14 Exposed installation

Indoor pipeline with exposed installation.

2.1.15 Concealed installation, embedded installation

Indoor pipeline installed in wall channel/well or pipe duct, or concealed by architectural decoration.

2.1.16 Manifold

A fitting or pipe with many outlets or connections relatively close together.

2.1.17 Compression fitting

Connecting pattern of fitting compressed on pipe with screw and locking nut.

2.1.18 Insert connections

Pipe connection by using special pipe clamp and clamp ring-connecting pattern.

2.1.19 Coefficient of line-expansion

The increase in unit pipeline length for one degree rise in temperature.

2.1.20 Plumbing fixture, fixture

Installed receptacles, device or appliance which are supplied with water or which receive liquid or liquid-borne wastes and discharge such wastes into the drainage system to which they may be directly or indirectly connected.

2.1.21 Fixture unit

Ratio between value of flow (water supply or drainage flow) as a base of some plumbing fixture and other plumbing fixtures value of flow (water supply or drainage flow).

2.1.22 Rate of flow

The quantity of water flows out in a unit time of a plumbing fixture.

2.1.23 Design flow

The average quantity of flow of water supply or water drainage in a certain period, it is the basic design flow of basic of building water supply and drainage pipeline system.

2.1.24 Head loss

The loss of pressure (or water head) in water supply and drainage pipe system.

2.1.25 Pneumatic

Water supply pattern, a composite set of pump and pressure vessel and accessories, water pumps into pressure vessel, the compressed air of vessel automatically regulate the amount of water supply and keep the pressure of water supply.

2.1.26 Points of distribution

Points of water consumption of water supply system.

2.1.27 Circulating period

Ratio between the effective water volume in circulating system structure or the transmission pipeline and circulation capacity per unit of time period.

2.1.28 Backwash

When filter clogging occurs, flash back with comparative high-pressure water flow.

2.1.29 Unassured hour for average year

Yearly average value of accumulated average year unassured total number of hours.

2.1.30 Water quality stabilization treatment

Water treatment process, keep the concentration of calcium carbonate and carbon dioxide in an equilibrium state in the circulating cooling water (neither calcium carbonate deposit nor solution corrosion), and restrain bacteria production.

2.1.31 Cycle of concentration

Ratio of salt concentration between circulating cooling water and the added water.

2.1.32 Self-priming

The top of centrifugal pump with horizontal axis, 1st stage inlet of centrifugal pump with vertical axis with multistage are set below the lowest design starting elevation, start up by gravity flow of water into the pump body.

2.1.33 Waterscape, fountain

Artificial build up waterscape, foundation.

2.1.34 Domestic soil

Residents discharge domestic fecal sewage from ordinary living processes.

2.1.35 Domestic waster water

Residents discharge wash water from ordinary living processes.

2.1.36 Domestic sewage

The water-borne wastes derived from ordinary living processes.

2.1.37 Building drain, outlet pipe

That part of the lowest piping of a discharge system which receives the discharge from soil, waste and other drainage pipes inside the walls of the building and conveys it to the outdoor manhole.

2.1.38 Vertical pipe, riser, stack

Any pipe or fitting which makes an angle of 45° or more with the horizontal.

2.1.39 Horizontal pipe

Any pipe or fitting which makes an angle of less than 45° with the horizontal.

1 Horizontal branch

Pipe section which connects fixture drain to vertical pipe.

2 Horizontal main

Pipe section which connects a number of vertical pipes to drain pipe.

2.1.40 Cleanout

Fitting for inside pipe cleaning installed on horizontal drain pipe.

2.1.41 Checkhole, checkpipe

Fitting with openable cover set on vertical drain pipe and comparatively long horizontal pipeline for inspection and cleaning.

2.1.42 Trap, water-sealed joint

A fitting or device which provides a liquid seal to prevent the emission of sewer gasses without materially affection the flow of sewage or waste water through it.

2.1.43 Water seal

An installation with a certain height water column to prevent air release from drainage pipe system into the rooms.

2.1.44 H pipe

H type fitting for connection vertical drain pipe and vent pipe.

2.1.45 Vent pipe, vent

Part of the vent system for drainage system air circulation, stable pressure, prevent the failure of water seal.

2.1.46 Vent stack

Vertical vent pipe installed to provide circulation of air to and from the drainage system and which extends through one or more stories.

2.1.47 Specific vent stack

Vertical vent stack only connect with vertical drain pipe, for the air circulation of vertical drain pipe.

2.1.48 Vent headers

Vent pipe section connect with several vent stacks or vertical drain top vent section and stretch out door into open air.

2.1.49 Main vent stack

Vertical pipeline connected with loop vent pipe and vertical drain pipe for air circulation of drain branch and drain vertical pipe.

2.1.50 Secondary vent stack, assistant vent stack

Vent stack only connect with loop vent, for air circulation of drain horizontal branch.

2.1.51 Loop vent

Vent pipe section of drain branch connected with several plumbing fixture from the lower end of first plumbing fixture to the main vent stack or assistant vent stack.

2.1.52 Fixture vent

Pipe section from the outlet of the trap of plumbing fixture to the vent stack.

2.1.53 Yoke vent, yoke vent pipe

Pipe section connecting the drain vertical pipe to the vent stack.

2.1.54 Indirect drain

Drain pipe of fixture or vessel connect indirectly with drainage system, there keep an air gap.

2.1.55 Buried depth

Vertical distance between buried pipe top to the ground surface.

2.1.56 Angle of turning flow

Angle between original flow direction and turning flow direction.

2.1.57 Depth ratio

Degree of fullness of water flow in the conduit, indicated by ratio between water depth and pipe diameter in pipe, or ratio between water depth and the designed water depth in conduit.

2.1.58 Grease interceptor

Small treatment structure for intercept, collect grease from domestic waste water.

2.1.59 Cooling tank

Treatment structure to decrease temperature of drain water.

2.1.60 Septic tank

A receptacle which receives the discharge of a drainage system for retain solid, digest organic matter through a period of detention and allow the liquid to discharge into the outside soil pipe.

2.1.61 Reclaimed water

Effluent from a waste water treatment plant that has undergone external treatment to remove harmful pathogens, organic material and heavy metals.

2.1.62 Hospital sewage

Polluted drainage water from hospital.

2.1.63 Primary treatment

Mechanical treatment, waste water primary treated by mechanical measures.

2.1.64 Secondary treatment

Composite of mechanical treatment and biochemical or chemical treatment for waste water treatment process.

2.1.65 Air change

Ratio between volume of draw in or blow-off the ventilation system within a unit of time and volume of room space.

2.1.66 Rainfall intensity

Rainfall in a unit of time, usually expressed as mm/min(or L/s.ha).

2.1.67 Recurrence interval

Through static analysis of long time observed rainfall record, equal or greater than some storm intensity rainfall occur once average interval time, the expressed unit is usually in year.

2.1.68 Duration of rainfall

Any continuous time section of rainfall duration, the expressed unit is usually in min.

2.1.69 Inlet time

Time of rainwater from correspond catchment area farthest spot surface flow into drain pipe inlet, the expressed unit is usually in min, abbreviated inlet time.

2.1.70 Time of flow

Time of rainwater flow in the pipe, the expressed unit is usually in min, abbreviated time of flow.

2.1.71 Catchment area

Drain conduit for rainfall catchment area, expressed unit usually in m^2 of ha.

2.1.72 Gravity storm system

Based on gravity flow design of roof rainwater drainage system.

2.1.73 Pressure storm system

Based on pressure flow design of roof rainwater drainage system.

2.1.74 Gully hole, gutter inlet

Ground surface rainwater inlet well with gully gratings and frames.

2.1.75 Down pipe, leader

Down pipe installed on inside or outside building wall applied to drain roof rainwater.

2.1.76 Hanged pipe

Horizontal pipe hang on building floor, beam or roof truss.

2.1.77 Rain strainer

A receptor facility receives roof surface rainwater flow into down pipe.

2.1.78 Runoff coefficient

Ratio between volume of certain catchment rainwater and volume of rainfall water.

2.1.79 Central hot water supply system

Hot water supply system for one set or many set building.

2.1.80 Local hot water supply system

A small hot water supply system used only to supply single or several point of distribution.

2.1.81 Open system for hot water supply

Hot water pipe system is open to the air in the hot water supply system.

2.1.82 Closed system for hot water supply

Hot water pipe system is closed to the air in the hot water supply system.

2.1.83 One-pipeline hot water system

Hot water system with one pipe supply, one temperature, no water temperature regulation of the water use spot.

2.1.84 Source of heat

Energy for heating hot water.

2.1.85 Heat medium

Heat transmission carrier for heat-supply system. Usually is hot water, steam, smoke.

2.1.86 Waste heat

Discharge from industrial production with heated waste such as waste steam, high temperature waste water, high temperature smoke.

2.1.87 Design heat consumption of maximum hour

Maximum heat consumption per hour in the hot water supply system installation.