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Code for Design of General Hospital

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Jointly issued by: **Ministry of Housing and Urban-Rural Development (MOHURD);**

General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ) of the People's Republic of China.

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Foreword

According to the requirements of the former Ministry of Construction - Notice on Printing *Development and Revision Plan of National Standard in Engineering Construction from 2002-2003* (Jian Biao [2003] No. 102), this code is jointly compiled by Planning and Information Bureau of National Health and Family Planning Commission, Chinese Hospital Association Hospital Architecture System Research Branch with organizations concerned.

During the process of formulating this code, the drafting group reviewed and finalized this code on the basis of extensive and deep investigation and by summarizing practical experience for designing hospital architecture throughout the years, widely soliciting for opinions and taking scientific research achievement as well as by reference to relevant domestic and foreign technical standards.

This code consists of 11 chapters, including general provisions, terms, medical process design, location and general site, architecture design, water supply and drainage, fire prevention and sewage, heating, ventilation and air conditioning system, electrical, intelligent system, medical gas system and steam system as its main technical contents.

The provisions printed in bold type are compulsory ones and must be enforced strictly.

Ministry of Housing and Urban-Rural Development is in charge of this code and explanation of compulsory provisions while Chinese Hospital Association Hospital Architecture System Research Branch is responsible for the explanation of specific technical contents. In order to further improve this code, all relevant organizations and individuals are kindly requested to sum up your experiences and accumulate information during the process of implementing this code. Whenever any modification or supplement is necessary, the relevant opinions and relevant information can be posted or passed on to Chinese Hospital Association Hospital Architecture System Research Branch (Address: Huanghuamen Street No. 43-1, Dongcheng District, Beijing, 100009, China) for future reference in revision.

Chief development organizations, co-development organizations, chief drafters and chief examiners of this code:

Developed by:

Planning and Information Bureau of National Health and Family Planning Commission

Chinese Hospital Association Hospital Architecture System Research Branch

Co-development organizations:

Shanghai Construction Design and Research Institute Co., Ltd.

China IPPR International Engineering Co., Ltd.

China Academy of Building Research

Tongji University

Architect Design & Research Institute of General Logistics Department, PLA

Chinese Academy of Medical Sciences Peking Union Medical College Hospital

Cancer Hospital Chinese Academy of Medical Sciences

1 General Provisions

1.0.1 This code is formulated with a view to making the design of general hospital meet the standard and the functional need of medical service and being in conformity with the standards of being safe, hygienic, economical, applicable, energy saving and environmental-friendly.

1.0.2 This code is applicable to design of newly constructed, renovated and extended general hospitals.

1.0.3 Medical process shall be dependent on the construction scale, management model and departments arrangement in the hospital. The design of hospital shall meet the medical process requirements.

1.0.4 Design of general hospital shall not only meet the requirements in this code but also those specified in the current related standards of the Nation.

2 Terms

2.0.1 General hospital

Hospitals which are provided with sick beds, departments of internal medicine, surgery, obstetrics and gynecology, pediatrics, ophthalmology, ENT, etc., medical-tech departments of pharmacy, testing, radiation, etc. and corresponding personal and equipment.

2.0.2 Medical process

Provision of medical flows and medical equipment as well as other relevant resources.

2.0.3 Medical flows

Procedure and link of medical service.

2.0.4 Emergency throughput

Capacity of emergency department to accept emergency patient at a time.

2.0.5 Hospital hygiene

It is to maintain key departments of hospital to be hygienic and prevent infection and hazards from harmful gas and chemical substances.

2.0.6 Hygiene passing through

Process to purify personnel and articles from unclean zone to clean zone by changing shoes, clothes and showering.

2.0.7 Intensive Care Unit

Independent intensive care medical units, which generally refer to intensive care unit (ICU), cardiovascular care unit (CCU) and neonatal intensive care unit (NICU) derived from ICU.

3 Medical Process

3.1 General Requirements

3.1.1 Medical process shall determine the medical business structure, function and scale,

3 Being quiet and far away from pollution source;

4 Being regular in topography and appropriate for functional layout in the hospital;

5 Being away from the production and storage areas of inflammable and explosive articles and the high-tension lines and their facilities;

6 Not being near to the places with crowded children activities;

7 Being forbidden to contaminate and influence other urban zones.

4.2 General Site

4.2.1 General site design shall meet the following requirements:

1 With appropriate function areas, distinct distinguishing between clean zone and contaminated zone, between doctors and patients and between persons and cars and being free from hospital infection risks;

2 With compact architectural composition and convenient traffic, being convenient for management and reducing energy loss;

3 Being assured to be quiet in the rooms for inpatients, operation, functional check and teaching & research;

4 Ward should face satisfactory direction;

5 Being reserved for development, renovation and extension;

6 With complete tree planting programme;

7 The waste treatment shall be arranged appropriately and also shall be in accordance with those specified in the relevant environmental protection laws and regulations.

4.2.2 The hospital shall be set with at least two entrances, and the personal entrance shall not be used for moving out corpse and waste.

4.2.3 The vehicle parking shall be set near to the entrances of outpatient department, emergency department and inpatient rooms.

4.2.4 Mortuary and pathological dissecting room shall be set in a concealed position. The incinerator, if any, shall not be influenced by the wind and isolated from the main buildings. The corpse route shall not be intersected with that for persons.

4.2.5 Environmental design shall meet the following requirements:

1 Greening landscape shall be arranged by making the best of landform, protection separation and other spaces, and the special green area for the recovery activities of patients shall be set;

2 Comprehensive design shall be made for greening, landscape, space in and out of buildings, environment and sign guidance system in and out of rooms;

3 In the rooms of department of pediatrics and near to their doors, the environmental design that meets the physical and psychological characteristics of children should be adopted.

4.2.6 The fore-and-aft clearance of wards shall meet the sunlight and hygienic spacing requirement and should not be less than 12m.

4.2.7 Staff dormitory shall not be constructed in the medical lands which shall be separated from the staff dormitory if connected and arranged with separate entrances.

5.1.9 Ceiling height shall meet the following requirements:

1 It should not be less than 2.60m in the diagnose room;

2 It should not be less than 2.80m in the wards;

3 It should not be less than 2.30m in public walkway ;

4 The ceiling height of medical technology department should be according to the need.

5.1.10 Thermal requirements of hospital building shall meet the requirements of the current national standard GB 50189 *Design Standard for Energy Efficiency of Public Buildings*.

5.1.11 Permissible noise level and sound isolation of wards shall meet the requirements of the current national standard GB 50118 *Code for Design of Sound Insulation of Civil Buildings*.

5.1.12 Interior decoration and protection should meet the following requirements:

1 The floor, skirting board, wainscot, wall surface and ceiling of the medical treatment rooms shall be in convenient for clearing and washing, and their internal and external corners should be built into rounded corners. The skirting board and wainscot shall be flat with the wall surface.

2 The rooms required to have higher hospital hygiene, such as operation room, clinical laboratory, central lab and pathology department shall be decorated internally to be clean and anti-corrosive.

3 Operating table of clinical laboratory, central lab and pathology department shall have a surface layer to be protective from corrosion, easy to washing and resistant to combustion. The relevant wash fountain and drainage pipe shall be made of resistant materials.

4 For pharmacy department, the compounding room, storage room, central drugstore and drug storehouse shall be provided with measures to be protective from moisture, insects and rats.

5 Mortuary and pathological dissecting room shall be provided with measures to be protective from insects, sparrows, rats and other animals.

5.1.13 Arrangement of rest room shall meet the following requirements:

1 Plane dimension of rest room compartment used by patients shall not be less than 1.10m×1.40m and the door shall be opened outwards and door bar shall be opened from inside and outside. The transfusion hook shall be arranged therein.

2 The sitting toilet bowl's circle should use materials which are difficult to contaminate and easy to be sterilized and the squatting toilet bowl's compartment shall have no height difference with other space. The toilet bowl shall be arranged with grab bar nearby.

3 The toilets shall be set with front room and non-manual hand basin.

4 The outdoor toilet should be connected with the outpatient service and inpatient building by vestibule.

5 Special accessible toilets shall be arranged for both men and women patients.

6 Accessible facilities and design of accessible special toilet and public toilet shall comply with GB 50763 *Codes for Accessibility Design*.

5.1.14 Medical wastes and domestic wastes shall be arranged separately.

5.2 Outpatient Department

5.2.1 The outpatient department shall be arranged close to the hospital traffic entrance and adjacent to medical technology building; the interrelationship of all divisions within the

outpatient department shall be well handled, and the flow line shall be reasonable to avoid hospital infection.

5.2.2 The arrangement of outpatient department shall meet the following requirements:

1 The hall, registered room, inquiry room, medical records room, preview and triage room, accounting room, cashier room, pharmacy, waiting room, blood sampling room, test room, transfusion room, injection room, outpatient service room, toilet etc. and public facilities for patients shall be arranged for public areas.

2 The examination room, therapy room, nurse station, dirty wash room etc. shall be arranged for each division;

3 The surgical dressing room, disposal room, debridement room, X-ray examination room, functional examination room, duty room and locker room, sundries storeroom toilet etc. may be arranged.

5.2.3 The arrangement of waiting room shall meet the following requirements:

1 A waiting room for a department should be arranged for the outpatient department, in case of small outpatient quantity, a waiting room for all departments may be arranged;

2 For the walkway, in case of single side for waiting, the clear width shall not be less than 2.40m, in case of both sides for waiting, the clear width shall not be less than 3.00m;

3 Separate arrangement of doctor and patient passages, electronic queuing management, booking register, registering and charging by layer etc. may be adopted.

5.2.4 The arrangement of examination room shall meet the following requirements:

1 For double examination room, the net size shall not be less than 3.00m, and the usable area shall not be less than 12.00m^2;

2 For single examination room, the net size shall not be less than 2.50m, and the usable area shall not be less than 8.00m^2.

5.2.5 The arrangement of rooms for gynecology, obstetrics and family planning shall meet the following requirements:

1 The rooms for gynecology, obstetrics and family planning shall be arranged in a separate zone, which may be arranged with separate entrance.

2 The isolation consulting room, gynecological examination room and women-only lavatory shall be added for gynecology; the combination mode of 1 gynecological examination room for no more than 2 consulting rooms should be adopted.

3 The rest room and special toilet shall be added for obstetrics and family planning.

4 The operating room and rest room may be added for gynecology; the abortion operating room and consulting room may be added for obstetrics.

5 The measures to block outside sight shall be provided for each room.

5.2.6 The arrangement of rooms for pediatrics shall meet the following requirements:

1 The rooms for pediatrics shall be arranged in a separate zone, which may be arranged with separate entrance.

2 The pre-examination room, waiting room, pediatric toilet, isolation examination room and isolation toilet etc. shall be added. The isolation area should be provided with separate entrance to outside.

3 The registered room, pharmacy, injection room, test room and transfusion room etc. may be arranged separately.

4 In the waiting room, area for each children patient shall not be less than 1.50m^2.

accordance With specific conditions.

5.5 Inpatient Department

5.5.1 The inpatient department shall be arranged in a separate zone and provided with separate or common entrance; it shall be arranged at the place with quiet environment and convenient transportation in the hospital and shall be provided with convenient contact with medical-tech department, operating department and emergency department; meanwhile, it shall be close to the auxiliary facilities of hospital, such as energy center, inpatient's dietary and washhouse etc.

5.5.2 The arrangement of hospital admission and discharge office shall meet the following requirements:

1 The management room for patient registration, settlement and visit shall be arranged;

2 The public facilities for patients may be arranged.

5.5.3 The scale of each nursing unit shall meet those specified in 3.2.1 of this code, those for specialized ward or required by teaching and research may be determined in accordance with specific conditions. The infectious wards (if arranged) shall be arranged separately and in a separate zone.

5.5.4 The arrangement of nursing units shall meet the following requirements:

1 The ward, rescue room, patient and medical care personnel toilet, washroom, bathroom, nurse station, doctor office, disposal room, therapy room, clothes-changing room, duty room, catering room, warehouse and dirty washing room etc. shall be arranged;

2 The rooms for dining, activity and dressing change of patients as well as conversation, visit and teaching of family members of patients may be arranged.

5.5.5 The arrangement of wards shall meet the following requirements:

1 The hospital beds shall be arranged parallel to the wall surface with lighting window. There should not exceed 3 beds for single row and 6 beds for double rows;

2 The clear distance between two parallel beds shall not be less than 0.80m, the clear distance between the hospital bed edge by the wall and the wall surface shall not be less than 0.60m;

3 The clear width of the passages among single-row hospital beds shall not be less than 1.10m and that of the passages among double-row hospital beds (bed ends) shall not be less than 1.40m;

4 The ward doors shall be directly open to walkway;

5 The rescue room should be close to the nurse station;

6 The clear width of the ward door shall not be less than 1.10m and the door leaf should be arranged with observation window.

7 The wall surface on both sides of the ward walkway shall be arranged with wall handrail and anti-collision facilities.

5.5.6 The nurse station should be connected with walkways of nursing unit by open space and connected with therapy room by door; the nurse station should observe the whole passage of nursing unit and the distance to farthest ward door should not exceed 30m.

5.5.7 The catering room shall be close to the entrance of dining car and shall be provided with boiling water supplying and heating facilities.

5.5.8 The washroom, bathroom and toilet for nursing unit shall meet the following requirements:

1 In case the toilet is located in wards, the visit personnel toilet should be arranged separately in nursing unit.

2 In case the toilets are centralized in nursing unit, the ratio of male to female patients should be 1:1; for men's room, 1 closet bowl and 1 urinal shall be arranged every 16 beds. For women's room, 3 closet bowls shall be arranged every 16 beds.

3 The toilet for medical care personnel shall be arranged separately.

4 The nursing units for washroom and bathroom shall be centralized; each 1 tap and shower shall be arranged every 12~15 beds and at least 2 for each nursing unit. The washroom and shower room shall be provided with front room.

5 The area of bathroom and toilet as well as the quantity of sanitary wares arranged in the ward shall be determined in accordance with operating requirements; the emergency call facilities and transfusion lifting hook shall be arranged.

6 The toilet in barrier-free ward shall be arranged in accordance with those specified in 5.1.13 of this code.

5.5.9 The dirty washing room shall be adjacent to the dirt outlet and also shall be arranged with filth discharging equipment as well as the washing and disinfection facilities of toilet bowls and sputum cups.

5.5.10 The wards shall not be arranged with open type waste well.

5.5.11 The arrangement of rooms for intensive care shall meet the following requirements:

1 The intensive care unit (ICU) should be adjacent to and shall be provided with rapid contact with operating department and emergency department;

2 The cardiovascular care unit (CCU) should be adjacent to and shall be provided with rapid contact with emergency department and interventional therapy section;

3 The intensive care unit, therapy room, disposal room, instrument room, nurse station and dirty washing room etc. shall be arranged;

4 The nurse station should be arranged at the place convenient to observe patients directly;

5 The clear distance among the intensive care beds shall not be less than 1.20m;

6 The single-bed ward shall not be less than 12.00m^2.

5.5.12 The arrangement of pediatric wards shall meet the following requirements:

1 The milk preparation room, milk tool disinfection room, isolation ward and special toilet etc. should be arranged for pediatric wards;

2 The intensive care unit (ICU), neonatal ward and children's playroom may be arranged;

3 Each isolation ward shall be provided with no more than 2 beds;

4 The bathroom and toilet facilities shall be suited for children;

5 The facilities like window and heat radiator shall be taken with safety protection measures.

5.5.13 The arrangement of obstetrics and gynecology wards shall meet the following requirements:

1 The gynecology shall be provided with examination room and therapy room.

2 The obstetrics shall be provided with prenatal examination room, pre-delivery room, delivery room, isolated pre-delivery room, isolated delivery room, perinatal care room, post-

3 The sanitary passages for medical care personnel including shoes- and clothes-changing rooms, toilet and bathroom shall be arranged at the entrance;

4 The bathroom and toilet for patients may be arranged separately and the shower and bathtub shall be equipped at the same time.

5 One bio-clean treatment unit shall be for one patient only, the clean standard shall meet those specified in 7.5.4 of this code, and the second shoes- and clothes-changing position shall be arranged at the entrance;

6 The bio-clean treatment unit shall be provided with observation window as well as visit window and intercom equipment for family members.

5.5.17 The arrangement of hemodialysis rooms shall meet the following requirements:

1 The hemodialysis rooms may be arranged in outpatient department or inpatient department and shall be arranged in a separate zone;

2 The shoes- and clothes-changing room for patients, dialysis room, isolated dialysis therapy room, therapy room, backwashing room, dirty disposal room, dispensing room, water treatment equipment room etc. shall be arranged.

3 The hygiene passing passages for medical care personnel including shoes- and clothes-changing rooms shall be arranged at the entrance;

4 The clear distance between therapy beds (chairs) should not be less than 1.20m and the clear distance between passages should not be less than 1.30m.

5.6 Reproductive Medicine Center

5.6.1 The reproductive medicine center shall be arranged with rooms for examination, B ultrasonic, semen collection, roe collection, in vitro fertilization, embryo transfer, inspection, endocrine hormone test and sperm bank etc.

5.6.2 The reproductive medicine center may be arranged with rooms for imageological examination and genetics test etc.

5.6.3 The roe collection room, in vitro fertilization laboratory and embryo transfer room shall meet the requirements for hospital hygiene.

5.7 Operating Department

5.7.1 The environmental requirements of operating department shall be in accordance with current national standard GB 15982 *Hygienic Standard for Disinfection in Hospitals*, the operating department shall be divided into general operating department and clean operating department, of which the later shall be designed in accordance with the relevant requirements of current national standard GB 50333 *Architectural Technical Code for Hospital Clean Operating Department*.

5.7.2 The location and plane arrangement of operating department shall meet the following requirements:

1 The operating department shall be arranged in a separate zone, should be adjacent to surgical nursing unit and should be provided with convenient access to relevant emergency department, interventional therapy department, intensive care department (ICU), pathology department, center (disinfection) supply room and blood bank etc.

2 It may set up the rooms such as diagnostic room, office room and patients' dressing room.

5.9.3 In scan-room, it shall set up the electromagnetic shielding, helium gas emissions and cooling-water supply facilities. Electromechanical pipeline shall not cross the scan-room.

5.9.4 Net-width of scan-room's door shall not be less than 1.20m, net-width of control-room's door should be 0.90m, and it shall allow the equipment to pass-through. Net-width of viewing window of MRI scan-room shall not be less than 1.20m, the net-height shall not be less than 0.80m.

5.9.5 The materials used in walls, floor-ground, doors-windows, openings, inserts, etc. of magnetic resonance diagnostic room, as well as the structure shall all adopt the shielding measures according to equipment requirements and shielding special provisions. After the room's location is selected, and before the shielding measures are determined, it shall measure the natural field strength.

5.10 Radiotherapy rooms

5.10.1 Radiotherapy rooms should be set up on the bottom-level, self-contained area; and it shall comply with the provisions of existing national protection standards; in which, the treatment machine-rooms shall be centralized and set up.

5.10.2 Setting-up of rooms shall comply with the following requirements:

1 It shall set up treatment machine-rooms (such as afterloading unit, cobalt 60, linear accelerator, γ knife, deep X-ray therapy, etc.), control, treatment planning system, simulation positioning, physical plan, mold room, waiting, care, diagnostic room, physician office, bathroom, dressing (doctors' and patients' are separated), dirt-wash and solid waste storage rooms etc.;

2 It may set up consultation and duty rooms etc.

5.10.3 The noise in treatment room shall not exceed 50dB(A).

5.10.4 Labyrinth shall be set up at exit-entrance of cobalt 60 treatment room, accelerator treatment room, γ knife treatment room and afterloading unit treatment room; and the irradiation direction of useful beam shall be avoided, as possible, to irradiate onto the wall of labyrinth. The net-width of protective doors and labyrinth shall all meet the requirements of equipment.

5.10.5 Protection shall be designed in accordance with the relevant existing national standards, such as, afterloading γ source short-distance health protection standards, γ long-distance treatment room design protection requirements, medical electron accelerator health protection standards, and medical X-ray treatment health protection standards.

5.11 Nuclear Medicine

5.11.1 Position and plane arrangement of nuclear medicine department shall meet the following requirements:

1 Nuclear medicine department shall be in a separate zone and meet the requirements of relevant current national protection standards. Radioactive source shall be provided with separate entrance.

2 Plane for the nuclear medicine department shall be arranged by zoning based on the sequence "control zone, supervision zone and non-restricted zone".

3 The control zone shall be located at end and installed with facilities to store and transport radioactive substances and to treat radioactive wastes.

4 Entrance for non-restricted zone out and in supervision zone and control zone shall be

arranged with hygiene passing through.

5.11.2 Arrangement of nuclear medicine room shall meet the following requirements:

1 Room for awaiting diagnosis, consulting room, doctor office and toilet etc. shall be arranged in non-restricted zone;

2 Scanning room, function determining room and exercise load test room, special waiting area and toilet shall be arranged in supervision zone;

3 Rooms for metering, medicine taking, injection, reagent preparation, hygiene passing through, source storage, sub-packaging, marking and washing shall be arranged in control zone.

5.11.3 Nuclear medicine room shall be designed according to relevant current national standards concerning radiological protection for clinical nuclear medicine.

5.11.4 Solid wastes and waste water shall be discharged after being treated according to relevant current national standards concerning radiological protection for management of medical radioactive waste.

5.11.5 Protective design shall meet the requirements of relevant current national standards concerning radiological protection for clinical nuclear medicine.

5.12 Interventional Treatment

5.12.1 Position and plane arrangement of interventional treatment room shall meet the following requirements:

1 Interventional treatment room shall be in a separate zone and with convenient connection with emergency department, operating department, cardiovascular intensive care unit.

2 Clean zone and unclean zone shall be arranged separately.

5.12.2 Arrangement of interventional treatment room shall meet the following requirements:

1 Angiocardiography equipment room, control room, machinery room, room for hand washing preparation, aseptic supplies and treatment, locker room and toilet shall be arranged;

2 Office, consulting room, duty room, nursing room and reference or data room may be arranged.

5.12.3 Interventional treatment user shall meet the requirements of medical equipment installation and indoor environment requirements.

5.12.4 Protective design shall meet equipment requirements and the requirements of relevant current national standards concerning medical X ray diagnosis health protection.

5.13 Laboratory

5.13.1 Position and plane arrangement of clinical laboratory shall meet the following requirements:

1 Clinical laboratory shall be in a separate zone, and microbiological test laboratory shall be arranged separately from laboratory for other inspections;

2 The microbiological test laboratory shall be located at end of the clinical laboratory.

5.13.2 Arrangement of the clinical laboratory shall meet the following requirements:

1 Laboratory for clinical examination, biochemical test, microbiological examination, blood test, cystoscopy, serum immunity, washing, reagents and materials library shall be

4 Clinics for pediatrics and department of infectious diseases should be arranged with separate dispensaries.

5.19.2 Pharmacy arrangement shall meet the following requirements:

1 Clinic pharmacy shall be arranged with rooms for medicine dispensing and reagent preparing, drug storehouse, office, duty room and locker room;

2 Inpatient pharmacy shall be arranged with rooms for medicine putting and dispensing, drug storehouse, office, duty room and locker room;

3 TCM pharmacy shall be arranged with Chinese patent drug storehouse, Chinese herbal drug storehouse and medicine boiling room;

4 First-level chemicals storehouse, office, duty room and toilet may be arranged.

5.19.3 Midrange of the dispensing window shall not be less than 1.20m.

5.19.4 Storehouse for noble medicine, virulent medicine, anesthetic and limited medicine as well as space to store inflammable and explosive medicines shall be provided with safety facilities.

5.20 General Sterile Supply Department

5.20.1 Position and plane arrangement of general sterile supply room shall meet the following requirements:

1 General sterile supply department shall be in a separate zone and should be with convenient connection with operating department, intensive care department, interventional treatment department and other function rooms;

2 Such department shall be arranged by zoning based on contaminated zone, clean zone and sterilized zone as well as along unidirectional flow, and auxiliary rooms for personnel shall be in a separate zone;

3 Personnel entering contaminated zone, clean zone and sterilized zone shall all be subjected to hygiene passing through.

5.20.2 Arrangement of rooms for general sterile supply department shall meet the following requirements:

1 Contaminated zone shall be arranged with rooms for picking up, classifying, cleaning and disinfection as well as cart washing (disinfection) center;

2 Clean zone shall be arranged with rooms for surgical dressing preparation, instrument preparation, sterilizing and quality inspection, disposable products storehouse, hygienic material storehouse and instrument storehouse;

3 Sterilized zone shall be arranged with rooms for sterilized articles storing;

4 Office, duty room, locker room, bathroom and toilet shall be arranged.

5.20.3 General sterile supply room shall meet the requirements of cleaning and disinfection, sterilizing, equipment installation and indoor environment.

5.21 Patient's Dietary

5.21.1 Position and plane arrangement of patient's dietary shall meet the following requirements:

1 Patient's dietary shall be in a separate zone, and should be adjacent to and with

convenient connection accessing to wards;

2 Catering room and dining car parking room shall be provided with facilities for washing and disinfecting dining car;

3 Harass on endemic area from steam, noise and odor generated in patient's dietary shall be avoided;

4 Plane arrangement shall comply with food processing flow.

5.21.2 Patient's dietary shall be arranged with rooms for staple food preparation, non-staple food preparation, staple food cooking, non-staple food washing and cutting, cold meat cooking, the Huis kitchen range, storehouse, catering and dining car parking, office and locker room.

5.22 Laundry

5.22.1 Position and plane arrangement of laundry shall meet the following requirements:

1 Laundry shall be in a separate zone and subjected to plane arrangement according to technological process;

2 The soiled linen inlet and the clean linen outlet shall be set separately;

3 Locker room, bathroom and toilet should be arranged separately;

4 Interference on endemic area from noise in laundry arranged at ground floor or underground floor of inpatient building shall be avoided;

5 Washings of personnel and patient shall be processed respectively;

6 In case socialized services are utilized for laundry, location for collecting, sorting, storing and granting shall be arranged.

5.22.2 Laundry shall be arranged with rooms for picking up, classifying, soaking and disinfection, washing, drying, ironing, sewing, storing and distributing as well as locker room.

5.23 Morgue

5.23.1 Position and plane arrangement of morgue shall meet the following requirements:

1 Morgue should be constructed or arranged separately at the underground floor of inpatient room;

2 Dissecting room shall be with door to access to morgue;

3 Corpse cabinet capacity should not be less than 1%~2% of the total sickbed number.

5.23.2 Morgue shall be arranged with rooms for corpse placing, farewell and dissecting, specimen room, duty room, locker room, toilet, apparatus room, washing room and sterilizing.

5.23.3 Refrigerating facilities shall be provided for corpse storing, and the height of the lower edge of the corpse storage drawer should not be greater than 1.30m.

5.23.4 Morgue shall be such arranged to avoid the influence from odor on the building where the morgue is located

5.24 Fire Prevention and Evacuation

5.24.1 Fire resistance rating of the hospital building shall not be less than Class II.

5.24.2 Fire compartment shall meet the following requirements:

1 The fire compartment of hospital building shall be divided in combination of building

article.

6.3 Drainage

6.3.1 Sanitary sewage in hospital dormitory area shall be discharged into municipal sewage drainage pipeline directly; ordinary domestic sewage and wastewater in courtyard area, if conditions permitting, may be discharged into municipal sewage drainage pipeline directly.

6.3.2 The following places shall adopt independent drainage system or indirect discharge and shall meet the following requirements:

1 Sewage of infectious diseases emergency and ward shall be collected and disposed independently;

2 Radioactive wastewater shall be collected and disposed independently;

3 Dentistry wastewater should be collected and disposed independently;

4 Boiler blow-down water, disinfecting condensed water of central sterile supply room shall be collected independently and be arranged cooling tank or cooling well;

5 Corrosive chemical reagents adopted in analysis test should be collected independently and shall be discharged into courtyard area sewage pipeline or be reclaimed after comprehensive disposal;

6 Drainage pipeline of other medical equipment or facilities shall adopt indirect drainage;

7 Mortuary and dissecting room shall adopt independent drainage system indoors and main vent shall reach good points of roof.

6.3.3 Indoor toilet drainage system should meet the following requirements:

1 Where building is constructed into at least two-storey and arranged with dark toilet or constructed into at least ten-storey, drainage system of toilet may adopt special vent stack system;

2 Where horizontal drainage pipe in public toilet exceeds 10.00m or there are more than three toilet bowl, circular travelling vent pipe should be adopted;

3 Branch drain of toilet instrument should not exceed 1.50m;

4 Bathtub should take anti-siphon measures.

6.3.4 The pipe diameter of drainage pipeline of central sterile supply room, traditional Chinese medicine processing room and stomatological department shall be larger than Grade 1~2 of calculated pipe diameter and shall not be less than 100.00mm, pipe diameter of branch pipe shall not be less than 75.00mm.

6.3.5 Pipelines for discharging radioactive sewage shall adopt machine-made plumbiferous cast-iron pipeline, horizontal pipes shall be laid in cushion or special radiation-proof suspended ceiling, and vertical pipe shall be installed in well with the wall thickness of concrete pipeline being not less than 150.00mm.

6.3.6 Water seal height of trap shall not be less than 50.00mm and shall not be larger than 100.00m.

6.3.7 The arrangement of land drainage floor drain in hospital shall meet the following requirements:

1 Rooms that often have water flow like bathroom and air-conditioner room shall be equipped with floor drain;

2 Room that may form water flow like toilet should be arranged with floor drain;

clean zone, must be arranged in clean zone and shall meet hygienic requirements of clean zone.

3 Nurse station should be arranged with fire hose reel.

6.7.2 The arrangement of automatic sprinkling system shall meet the following requirements:

1 Sprinkler shall be arranged to the places within building except those places occurring sharp reaction with water or should not extinguish with water in accordance with the actual situations like the hazardous degree caused by the fire hazard and the extinguishing difficulty.

2 Ward shall adopt rapid reaction sprinkler;

3 Operation department's clean corridor should adopt concealed sprinkler.

6.7.3 Gas extinguishing device shall be arranged in valuable equipment rooms, record room and information center (network) computer room of the hospital.

6.7.4 Automatic fire extinguishing system shall not be arranged in hematology ward, operating room and equipment room with invasive test.

6.8 Sewage Treatment

6.8.1 Medical sewage discharge shall meet the relevant requirements of the current national standard of GB 18466 *Discharge Standard of Water Pollutants for Medical Organization*, and shall meet the following requirements:

1 Where medical wastewater is discharged into urban drainage pipeline with existing municipal sewage treatment plant, disinfection treatment process shall be adopted;

2 Where medical sewage is discharged into natural water bodies directly or indirectly, biochemistry sewage treatment process of Grade 2 shall be adopted;

3 Medical sewage must not be used as reclaimed water source.

6.8.2 The discharge of radioactive sewage shall meet the relevant requirements of the current national standard GB 18871 *Basic Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources*.

6.9 Pipe Material

6.9.1 Pipe material of water supply and hot water system shall be determined as required, stainless steel pipe, plastic pipe, plastic and metal composite pipe and hot-dip galvanizing steel pipe complying with current relevant national standard may be selected.

6.9.2 Machine-made cast-iron drainage pipe or plastic pipe may be selected for pipe material of drainage system. The water discharge pressure of rain drainage pipeline shall be determined in accordance with building height and shall select suitable pressure pipe.

6.9.3 Direct potable water systematic pipe should adopt stainless steel pipe.

6.9.4 Non-magnetic pipe material like copper tube or plastic pipe shall be adopted in magnetic shielding places.

7 Heating, Ventilation and Air Conditioning System

7.1 General Requirements

coil unit.

7.1.12 When the annual average of outdoor inhalable particles PM10 does not exceed the second grade concentration limitation applicable in Category II zone as specified in "Ambient Air Quality Standard" (GB 3095), two stage filter (low and medium efficiency) shall at least be set at the fresh air acquisition hole; when the outdoor PM10 exceeds the annual average second grade concentration limitation, a high/medium efficiency filter shall be added.

7.1.13 The fresh air volume of central air conditioning system in medical room shall not be less than 40m^3/h per person or the fresh air volume shall not be less than 2 times/h. For the place with many people, the appropriate fresh air volume shall apply after economy and technology comparison.

7.1.14 The air exhaust in the place with harmful microorganism, harmful aerosol and other pollutants, such as nuclear medicine examination room, radiotherapy room, pathology collection room, clinical lab and infectious disease ward, shall not be carried out until reaching the standard after processing.

7.1.15 The exhaust fan without special requirements shall be set at the end of exhaust pipeline to make the whole pipeline under negative pressure.

7.1.16 The hospital heating, ventilation and air conditioning (including cold/heat sources) shall be designed according to the relevant requirements of current national standard "Design Standard for Energy Efficiency of Public Buildings" (GB 50189) under the premise of guaranteeing diagnosis, treatment and infection control.

7.2 General Requirements for Clean Rooms

7.2.1 Clean room shall be selected according to needs and possibilities.

7.2.2 In vacant state or static conditions, the bacterial concentration (depositing bacterial concentration or airborne bacterial concentration) and air dust concentration in clean room (excluding clean operating room) shall be graded according to Table 7.2.2. The air changes shall not exceed 1.2 times of the upper limit specified in Table 7.2.2.

24°C ~ 26°C in premature babies, neonatal intensive care unit (NICU) and immune deficiency suckling room; the noise should not be greater than 45dB(A);

4 Premature babies and neonatal intensive care unit (NICU) and immune deficiency suckling room should be Grade III clean room.

7.5.3 The intensive care unit shall meet the following requirements:

1 The temperature should not be less than 24°C in winter and not higher than 27°C in summer.

2 When common air conditioning system is used, continuous operation should be adopted and those specified in 7.1.10 and 7.1.11 of this code shall be satisfied; the relative humidity should be 40%~65%. The noise shall not be greater than 45dB(A) and up supply and down return air distribution should be adopted. The supply airflow should not directly blow towards head. Each ward bed shall not be placed at the downwind side of other ward beds. Exhaust outlet (or return air inlet) shall be arranged near the end of the bed.

3 Grade IV standard design should be used for clean room and independent air cleaning and conditioning system should be arranged. At least 5Pa positive pressure should be maintained by ward to corridor or corridor to outside.

7.5.4 The hematology unit shall meet the following requirements:

1 Grade I clean room shall be selected for the hematology ward in treatment period and Grade II clean room or above should be selected for the hematology unit in recovery period. Up supply and down return air distribution mode shall be adopted. Vertical unidirectional flow shall be set at the place above the patient's activity area (including ward bed) in Grade I ward; the area of air supply outlet shall not be less than $6m^2$ and down return air distribution on both sides shall be adopted. If horizontal unidirectional flow is adopted, the patient's activity area shall be arranged at the upstream of air flow and bed head shall be at the air supply side.

2 The air cleaning and conditioning system in each ward shall use independent double-fan connection in parallel for mutual standby and keeping 24h operation.

3 Speed regulation device shall be adopted for air supply and at least two levels of wind speed shall be set. The section air velocity in working area shall not be less than 0.20m/s when the patients are in activity or under treatment and shall not be less than 0.12m/s when the patients are resting. The indoor temperature in winter should not be lower than 22°C and the relative humidity should not be less than 45%. The indoor temperature in summer should not be higher than 27°C and the relative humidity should not be more than 60%. The noise shall be less than 45dB(A).

4 5Pa positive pressure shall be maintained with adjacent and connected room.

7.5.5 Whether clean room is used for burn ward shall be determined as required. The adoption of clean room shall meet the following requirements:

1 The ward for severe or above burn patients shall have centralized air supply vent above the ward bed; the air supply surface area shall extend 30cm or more along the four sides of the ward bed and the air changes shall be calculated based on Grade III clean room, or Grade II clean room if otherwise required. The auxiliary rooms and the ward for patients below severe burn may have dispersed air supply outlet and the air changes shall be calculated based on Grade IV clean room.

2 Standby supply fan shall be arranged for the air cleaning and conditioning system in each ward and shall keep 24h uninterrupted operation. The temperature and humidity shall be

adjusted according to the needs in treatment process.

3 For Grade IV burn ward with multi-bed in one room, no ward bed shall be placed at the downwind side of other beds. The full-year temperature should be 24°C~26°C and the relative temperature should not be less than 40% in winter and should not be higher than 60% in summer. The indoor temperature and humidity may be adjusted according to the needs in treatment process.

4 Independent air conditioning system should be arranged in the ward for severe or above burn patients and the indoor temperature and humidity may be adjusted according to the needs in treatment process. The temperature may be adjusted to 32°C to the highest humidity may be adjusted to 90%.

5 5Pa positive pressure shall be maintained with adjacent and connected room.

6 Bathroom and washroom in inpatient area shall be arranged with air exhaust device and closed air valve interlocking with exhaust fan shall also be arranged.

7 The noise in ward shall not be greater than 45dB(A).

7.5.6 Allergic asthma ward shall meet the following requirements:

1 Clean room may be adopted;

2 The noise shall not be greater than 45dB(A). Temperature and humidity shall be relatively stable; the full-year temperature should be 25°C±1°C and the relative humidity should be 50%. 5Pa positive pressure shall be maintained with adjacent and connected room.

7.5.7 Dissecting room, specimen preparation room and morgue shall meet the following requirements:

1 The dissecting room and specimen preparation room for corpses of patients with non-infective disease shall have sufficient ventilation, special dissecting table shall be adopted or lower air outlets shall be arranged uniformly in the room to make the air exhaust to the outside directly;

2 The air conditioning in dissecting room shall use full fresh air independent system and special air exhaust dissecting table may be used in combination;

3 When specimen preparation room share same air conditioning system with storeroom, independent control according to the temperature conditions of each room shall be possible;

4 The morgue shall have sufficient ventilation. Negative pressure shall be maintained in the case of mechanical exhaust.

7.5.8 The negative pressure isolation ward shall meet the following requirements:

1 Self circulation air conditioning system shall be adopted with the air changes of 10 times/h~12 times/h and intensive fresh air supply available. The ward for patients with special respiratory disease that may spread through the air shall adopt entire fresh air system.

2 The final-level- filter in air supply should use high and medium efficiency filter and return air inlet (exhaust outlet) shall be arranged with leakless negative pressure highly-efficient exhaust device.

3 One air supply outlet shall be set at the bed end or both bed side and bed end; the return air inlet should be arranged in the lower part of the bed head.

4 Buffer room shall be arranged at the ward entrance and the corridor entrance of inpatient area; leakless negative pressure highly-efficient exhaust device shall be arranged in the washroom.

5 5Pa negative pressure difference shall be maintained by the ward to buffer room and

the buffer room to corridor; directional flow shall be maintained by the ward to washroom.

7.6 Operating Department

7.6.1 The design of clean operating department shall meet the requirements of the current national standard "Architectural Technical Code for Hospital Clean Operating Department" (GB 50333).

7.6.2 The indoor temperature of general operating room should not be lower than 20°C in winter and should not be higher than 26°C in summer; the indoor relative humidity should not be less than 30% in winter and should not be higher than 65% in summer; air conditioning system or full fresh air ventilation system with the final filter efficiency not less than high and medium efficiency filter shall be adopted. Positive pressure shall be maintained in the room and the air changes shall not be less than 6 times/h. The noise shall not be greater than 50dB(A).

7.7 Medical Technology Department

7.7.1 Examination department, pathology department and laboratory shall meet the following requirements:

1 The independent ventilation system shall be provided;

2 When common air conditioning is used, the indoor temperature should not be lower than 22°C in winter and should not be higher than 26°C in summer; the indoor relative humidity should not be less than 30% in winter and should not be higher than 65% in summer.

7.7.2 In vitro fertilization (IVF) laboratory in reproductive science center shall be designed according to Grade I clean room and shall adopt local centralized air supply or clean bench. Egg retrieval room shall be designed according to Grade II clean room and shall adopt local centralized air supply or clean bench. The noise in IVF laboratory and egg retrieval room shall not be greater than 45dB(A). Other clean auxiliary rooms such as freezing room, working room and clean corridor may be designed according to Grade IV clean room and shall adopt local centralized air supply.

7.7.3 Electrophysiological, ultrasonic and fiberscope departments, etc. shall be arranged with independent common air conditioning system.

7.7.4 Hearing examination room shall be arranged with centralized air conditioning system, noise elimination vibration-damping measures shall be taken, and the noise shall not be greater than 30dB(A). In the examination with high requirements for silence, measures like temporarily stopping air conditioning and cutting off air flow may be adopted.

7.7.5 The operating area of angiocardiography room should be Grade III; the clean corridor shall be one grade lower than the operating area and shall maintain 5Pa positive pressure with the adjacent and connected room. Common air conditioning shall be adopted for auxiliary rooms.

7.7.6 The air conditioning system and ventilation system in the examination room, control room and machine room of radiology department shall meet the following requirements:

1 Air conditioning system shall be selected according to the equipment requirements.

2 When using semi-centralized air conditioning system, any terminal device like fan coil

unit and its condenser tube shall not be set above the machine.

3 Ventilation system shall be set in the examination room, control room and dark room of radiology department; corrosion-proof air duct shall be adopted for ventilation of automatic processor. Check valve shall be set on the exhaust pipe.

4 As for through-wall air duct and tubing in rooms with ray shielding, shielding measures not less than wall lead equivalent shall be taken.

7.7.7 Independent constant temperature and humidity air conditioning system should be adopted in the MRI room; the room temperature shall be 22°C±2°C and the relative humidity be 60%±10%. Non-magnetic air vent that can shield electromagnetic wave shall be adopted in the scanning room and any magnetic pipeline shall not pass through it. Independent exhaust system shall be set for the liquid helium cooling system of MRI machine and shall be directly connected to the outdoor exhaust pipe of the MRI machine. The piping shall adopt non-magnetic materials and the pipe diameter shall not be less than 250mm.

7.7.8 Independent constant temperature and humidity air conditioning system should be adopted in the rooms for all nuclear radiation risks of the nuclear medicine department. The temperature in the scanning room shall be 22°C±2°C and the temperature variation in 1h should not exceed 3°C. The relative humidity in the scanning room shall be 60%±10%. Other rooms may adopt common air conditioning, but the air exhaust shall be performed according to the requirements of current national standards "Radiological Protection Standard for Clinical Nuclear Medicine" (GBZ 120) and "Radiological Protection Standard for Management of Medical Radioactive Waste" (GBZ 133).

7.7.9 The air conditioning system in the room for radioactive isotope therapy shall be determined according to the category and the service conditions of radioactive isotope; full fresh air conditioning should be adopted. In respect to the outside of radioactive isotope management area, the inside shall maintain negative pressure; vinyl chloride lining air duct should be adopted for exhaust duct and air tightness valve shall be set in the ventilation system; a fan shall be set at the exhaust side of purifying treatment device and the negative pressure in the exhaust pipe shall be maintained; the exhaust fan shall be closed after the air conditioning system. If radioactive isotopes are stored in the storage room and waste storeroom, 24h ventilation shall be performed.

7.8 Central Sterile Supply Room

7.8.1 Ordered pressure gradient and directional airflow shall be maintained in the central sterile supply room. The directional airflow shall flow from the sterile area to the decontamination area. The positive pressure of sterile storage area for adjacent and connected rooms shall not be lower than 5Pa; at least 5Pa negative pressure shall be maintained by the decontamination area to adjacent and connected rooms and the outdoor.

7.8.2 The sterile storage area should be designed according to the clean room not lower than Grade IV and shall adopt independent air cleaning and conditioning system. Local ventilation shall be set for the autoclave sterilizer; low-temperature sterilizing room shall be provided with independent ventilation system; the temperature should not be less than 18°C in winter and should not be greater than 24°C in summer; the indoor relative humidity should not be less than 30% in winter and should not be greater than 60% in summer.

7.8.3 Independent local ventilation shall be set in the decontamination area and the total air output shall not be lower than the difference required by the negative pressure. Air filters not lower than medium efficiency shall be set at the return air inlet of the decontamination area.

7.8.4 In the areas using common air conditioning, the temperature should not be less than 18°C in winter and should not be greater than 26°C in summer.

8 Electrical

8.1 General Requirements

8.1.1 The medical locations in the hospital shall be classified according to the electrical safety protection requirements and shall meet the following requirements:

1 Medical locations not using contact parts of medical electrical equipment shall be Category 0;

2 Medical locations where the contact parts of medical electrical equipment shall contact with the surface and internal of patient body (excluding the positions stated in Category 2 medical locations) shall be Category 1;

3 Medical locations where the contact parts of medical electrical equipment shall contact with the internal of patient body (i.e. the heart or the position near the heart) and where power interruption will endanger the life of patient shall be Category 2.

8.1.2 The classification of medical locations and the automatic power supply recovery time should meet the requirements of Table 8.1.2.

rated voltage of equipment shall not exceed AC root mean square value 25V or ripple-free DC 60V, and insulation protection measures shall be taken.

8.3.2 Indirect electric shock prevention and power-off protection shall be provided in Categories 1 and 2 medical locations, and shall meet the following requirements:

1 As for IT, TN and TT systems, the contact voltage shall not exceed 25V.

2 The maximum break time at 230V of TN system shall be 0.2s and 400V be 0.05s.

3 The neutral point of IT system does not distribute and the maximum break time at 230V shall be 0.2s.

8.3.3 If TN system is adopted, the following requirements shall be met:

1 Residual current device (RCD) with the maximum residual operating current of 30mA shall be adopted for the end loop with the rated current less than or equal to 32A in Category 1 medical locations.

2 Leakage protector with the rated residual current less than or equal to 30mA shall be set for the following loops in Category 2 medical locations:

1) Power supply loop of the driving mechanism for operating table;
2) Loop of movable X-ray device;
3) Loop of large equipment with the rated capacity exceeding 5kV·A;
4) Electrical equipment circuit of non-life support system.

8.3.4 If TT system is adopted, the requirements of 8.3.3 of this code shall be followed and all power distribution circuits shall be installed with residual current device (RCD).

8.3.5 Except the electrical loops given in Item 2 of 8.3.3 of this code, medical IT system shall be adopted for the electrical devices and power supply loops in Category 2 medical locations for maintaining patient life, operation and other situated in the range of "patient's area". If medical IT system is adopted, the following requirements shall be met:

1 At least one independent medical IT system shall be installed in the adjacent rooms with multiple same functions.

2 The medical IT system must be equipped with insulated monitor and shall meet the following requirements:

1) The AC internal resistance shall be greater than or equal to 100kΩ;
2) The testing voltage shall not be larger than DC 25V;
3) Under any fault condition, the testing peak current shall not be larger than 1mA;
4) When the resistance is reduced to 50kΩ, signal shall be sent and test facilities shall be provided.

3 Each medical IT system shall be set with signal light showing the operating state and audible & visible alarm device. The audible and visible alarm device shall be installed in locations convenient for permanent monitoring.

4 Overload and high temperature monitoring shall be set for the isolation transformer.

8.3.6 Auxiliary medical equipotential bonding busbar shall be set in the "patient's area" of Categories 1 and 2 medical locations, and the metal shielding layers of protective conductor, external conductive part, anti-electromagnetic interference shielding, conductive floor network and isolation transformer shall be connected with the equipotential busbar through the equipotential connecting wires.

8.3.7 In Category 2 medical locations, the resistance (including joint resistance) between the protective conductor terminal of power socket, fixed equipment or any external conductive parts and the equipotential bonding busbar shall not exceed 0.2Ω.

8.3.8 The auxiliary medical equipotential busbar shall be installed in the operation places, and shall be close to or in the distribution box.

8.4 Selection and Installation of Electrical Equipment

8.4.1 The isolation transformer of medical IT system shall meet the following requirements:

1 Single-phase transformer should be adopted for medical IT system whose rated capacity shall not be less than 0.5kVA and should not exceed 8kVA;

2 The isolation transformer shall be close to the operation place and protective measures shall be taken;

3 The rated voltage at the secondary side of isolation transformer shall not exceed 250V;

4 When the isolation transformer is subjected to no-load operation under the rated voltage and frequency, the leakage current flowing to the enclosure or the ground shall not exceed 0.5mA.

8.4.2 In Categories 1 and 2 medical locations, Type A or Type B residual current protector shall be selected according to the characteristics of the possible fault current.

8.4.3 Short circuit and overload protection shall be set for each end loop of Category 2 medical locations, but overload protection shall not be set at the primary and secondary sides of transformer for medical IT system.

8.4.4 In Category 2 medical locations, each terminal circuit at the secondary side of medical IT system shall be set with double-stage protection device, and multiple sockets for power supply of at least two independent loops shall be provided. Short circuit protection shall be independently set for each group of socket circuit; if conditions permit, overload alarm may be set independently. The socket of medical IT system shall be provided with fixed and visible signs.

8.4.5 Two lighting circuits with different power supplies should be provided in Categories 1 and 2 medical locations.

8.4.6 The installation distance between the electrical device and the medical gas outlet shall not be less than 0.20m.

8.4.7 The fire protection design in the hospital shall meet the following requirements:

1 Low-smoke and zero-halogen (LSZH) anti-flaming type or mineral insulation type should be adopted for power supply and control cables of the emergency system;

2 Signal alarm shall be adopted for fire prevention and electricity leakage protection.

8.5 Safe Power Supply System

8.5.1 In Categories 1 and 2 medical locations, when the voltage drop value of any conductor is larger than 10% of the standard voltage, safe power supply shall be started automatically. The classification of safe power supply shall meet the requirements of Table 8.5.1.

requirements.

9.2.5 Where indoor mobile communication coverage system is set, the router and equipment installation space shall be reserved.

9.2.6 Where satellite communication system is set, the information communication requirements including voice, data, image, multimedia and the like shall be met.

9.2.7 Where cable TV system is set, the following requirements shall be met:

1 The cable TV socket should be set near the television screen in lobby, cashier and registration windows, waiting room, rest room, coffee house, transfusion room, meeting room, demonstration room, medical rehabilitation center, wards, etc.;

2 Where television sound system is adopted in multi-bed ward, volume-adjustable earphone jack should be set at each bed.

9.2.8 Emergency broadcasting system shall be installed in the hospital. The public broadcasting system, if installed, should share the same set of line and end equipment (loudspeaker) with the emergency broadcasting system. The end equipment should be installed in public places, and volume adjusting device should be set at the service desks in both outpatient and waiting room of the medical technology department, as well as at the ward nurse station. It shall automatically switch to emergency broadcasting at fire alarming.

9.2.9 Where guidance and information display system is installed, touch screen information inquiry terminal and large color display should be installed in public places.

9.2.10 Where clock system is installed in the hospital, the secondary clocks should be set in the ward nursing unit, triage, as well as the nurse station, operating room, consulting room and office of every medical technology examination department.

9.3 Information Application Systems

9.3.1 The hospital information system should be composed of management information system, clinical information system and information support & maintenance system.

9.3.2 Where queuing and calling system is set, the following requirements shall be met:

1 Network structure should be adopted; system software connects with the hospital information system;

2 Screen display and voice prompt devices shall be installed at the registration window and nurse station for triage;

3 Virtual or physical calling device may be installed in the consulting room as required.

9.3.3 Visiting system should be set in ICU and the following requirements shall be met:

1 Two-way transmission of voice and video signals should be set, and the operation control system shall be installed in the nurse station;

2 The patient terminal should be easy to operate. The visiting terminal should have certain privacy.

9.3.4 Where video demonstration system is set in operating room, the following requirements shall be met:

1 The video signal shall adopt one-way uploading while voice signal shall adopt two-way transmission.

2 The video shall collect panoramic and local (shadowless lamp camera) image signals; spare socket shall be provided; high-definition camera for rebroadcasting may be set on the

head mast. Display screen shall be installed in demonstration room.

3 In control room, switching management shall be applied for the image and audio signals in all operation demonstration room.

4 The video demonstration system shall not access to the cable TV system.

9.3.5 Where monitoring and management system is set in operating room, the following requirements shall be met:

1 Computer networking technology shall be adopted for centralized monitoring and management of the operating room's condition and environmental change, etc.;

2 The operating terminal should adopt touch screen.

9.3.6 Intercom system should be set in the nursing unit and the following requirements shall be met:

1 Patient calling terminal shall be installed at the bed and in toilet;

2 Intercom switchboard shall be installed in the nurse station;

3 Call display lamp or display screen shall be set in the corridor;

4 Wireless calling terminal may be set.

9.3.7 The intelligent card system, if installed, shall meet the requirements of registration, dispensing, payment, as well as medical personnel identification, attendance, entrance guard, parking, consumption, etc.

9.4 Public Safety Systems

9.4.1 Public safety system shall be provided with automatic fire alarm and firefighting coordinated control system, and the design of automatic fire alarm system shall meet the relevant requirements of the current national standard "Code for Design of Automatic Fire Alarm System" (GB 50116).

9.4.2 Where building equipment monitoring and control system is set, computer network control device shall be adopted to monitor, manage and control the electromechanical equipment (excluding firefighting equipment) in the hospital based on the principle of centralized management and decentralized control.

9.4.3 The public safety system shall be equipped with security & technology protection system, and the following requirements shall be met:

1 Where video monitoring system is equipped, camera may be set at every external exit and entrance at the first floor of the hospital, cashier and registration office, financial department and hospital settlement, expensive medicine storehouse, elevator car, elevator hall of each floor and sites of frequent personnel activities. Digital hard disk shall be adopted for image storage and query.

2 Where intrusion alarm system is installed, manual alarm button or other anti-intrusion detector shall be set at the important sites such as expensive medicine storehouse, charging terminal, etc., and shall link with the video monitoring camera.

3 Where access management system is installed, entrance guard may be set at the important sites such as information center, expensive medicine storehouse, as well as at the main entrance and exit of operation department and ward nursing unit. Entrance guard shall also be set at the access door requiring doctor-patient separation. At fire alarming, the corresponding access door shall be kept open by linkage control of firefighting system.

system design load.

10.2.2 The hospital shall be equipped with oxygen and vacuum suction system; such systems as compressed air, nitrous oxide, nitrogen, carbon dioxide, argon and waste anesthetic gas discharge may also be set as required. The gas supply shall comply with the gas parameters at terminal.

10.2.3 The dedicated gas supply station for operation department shall be set at its nearest unclean area.

10.2.4 The oxygen supply pipeline for the operation department, ICU, emergency room and rescue room shall be led from the oxygen station separately.

10.2.5 The gas supply station shall be equipped with gas supply abnormality alarming device. Standby unit shall be equipped with automatic operation device.

10.2.6 The hospital should adopt oil-free air compressor, for which filtration sterilization equipment shall be set.

10.2.7 The medical gas source shall be provided with safety valve for overpressure discharge, and the gas shall be discharged to the outdoor safe place.

10.2.8 The oxygen station with molecular sieve oxygen generating unit shall be set according to the following requirements:

1 The oxygen station should be set independently or on the roof of the building;

2 **The fire resistance rating of the partition wall between oxygen manifold room and machine room shall not be lower than 1.5h. Class A fire door shall be adopted as the communicating door between oxygen manifold room and machine room;**

3 **The fire resistance rating of the partition wall between oxygen tank and machine room shall not be lower than 1.5h. Class A fire door shall be adopted as the communicating door between oxygen tank and machine room.**

10.2.9 Where liquid oxygen is supplied, the liquid oxygen tank larger than 500L shall be placed outside. The distance between the outdoor liquid oxygen tank and the office, ward, public place, bustling road shall be larger than 7.50m.

10.2.10 The vacuum suction machine room shall be arranged separately, and the exhaust gas shall be discharged into air after treatment.

10.3 Gas Piping

10.3.1 Medical gas pipeline shall adopt copper pipe or stainless steel pipe, vacuum suction pipeline and exhaust discharge pipeline of operating room may adopt galvanized steel pipe. The pipeline, valve and instrument accessories shall be subjected to degreasing treatment before installation.

10.3.2 The oxygen supply pipeline shall not be laid in the same piping shaft or trench with the pipelines of cable, corrosive gas and combustible gas. The piping shaft laid with oxygen supply pipeline should be ventilated.

10.3.3 Where overhead oxygen pipeline is applied, it may be laid on the same rack with various gas and liquid (including fuel gas, fuel oil) pipelines. In this case, the oxygen pipeline should be arranged outside other pipelines and should be above the fuel pipeline. Separate support and hanger shall be set for the medical gas pipeline servicing for clean operating department.

List of Quoted Standards

GB 50034	Standard for Lighting Design of Buildings
GB 50057	Design Code for Protection of Structures against Lightning
GB 50116	Code for Design of Automatic Fire Alarm System
GB 50118	Code for Design of Sound Insulation of Civil Buildings
GB 50189	Design Standard for Energy Efficiency of Public Buildings
GB 50264	Design Code for Insulation Engineering of Industrial Equipment and Pipe
GB 50311	Code for Engineering Design of Generic Cabling System
GB/T 50314	Standard for Design of Intelligent Building
GB 50333	Architectural Technical Code for Hospital Clean Operating Department
GB 50352	Code for Design of Civil Buildings
GB 50763	Codes for Accessibility Design
GBZ 133	Radiological Protection Standard for Management of Medical Radioactive Waste
GBZ 120	Radiological Protection Standard for Clinical Nuclear Medicine
GB 3095	Ambient Air Quality Standard
GB/T 4272	General Principles for Thermal Insulation Technique of Equipment and Pipes
GB 5749	Standards for Drinking Water Quality
GB/T 8175	Guide for Design of Thermal Insulation of Equipment and Pipes
GB 15982	Hygienic Standard for Disinfection in Hospitals
GB 18466	Discharge Standard of Water Pollutants for Medical Organization
GB 18871	Basic Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources
JGJ 40	Code for Architectural Design of Sanatorium
CJ 94	Water Quality Standards for Fine Drinking Water

END

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