

Hospitals Should be Safe from Disasters

Reduce Risk,
Protect Health Facilities,
Save Lives



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Table of Contents

	Page
<i>Foreword</i>	ii
<i>Preface</i>	iii
<i>Contributors</i>	iv
Introduction	1
What is a Safe Hospital?	2
What are the Essentials in Supporting Safe Hospitals?	2
What are the Structural Indicators of Safe Hospitals?	3
What are the Non-structural Indicators of Safe Hospitals?	5
What are the Functional Indicators of Safe Hospitals?	18

Foreword

Every year, many hospitals and health facilities in the country are damaged and destroyed by disasters to which the Philippines has a very high vulnerability. However, the government through the Department of Health has been nonstop in its efforts to ensure that our countrymen are not left without the vital care that they need in the midst of these catastrophes.

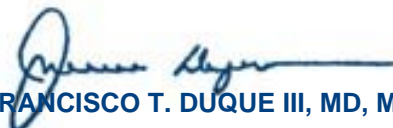
"The price to pay for the failure of health care facilities when disasters happen is too high in comparison to the cost of making these safe and resilient." Recent disaster experiences in the Bicol and Visayas Region and in earlier years in the Quezon Province highlight the tremendous impact that disasters can have on health facilities and local health systems.

The health sector is filled with highly trained, committed, and dedicated personnel who are ready to deliver healthcare especially in times of great suffering and need. To achieve and maintain quality of health care during health emergencies, these personnel will have to be supported by enabling them to work in safe health facilities where they can do what they do best --- save lives and limit injuries among disaster victims.

Among the objectives of the global campaign for "Hospitals Safe from Disasters" is to reinforce both the structural and non-structural resilience of health care facilities and to ensure that they continue to function after a disaster strikes. The first points to structures in safe geographical locations while the latter refers to health personnel and emergency preparedness plans which will keep hospitals operational in the wake of disasters.

By applying current knowledge and exercising strong political leadership, it is possible to protect health facilities from disasters, even in resource-constrained settings like the Philippines. The Hyogo Framework for Action calls for government support to ensure that existing and new health care facilities will be re-structured or engineered to remain functional at the height of an emergency.

Therefore, I commend the Steering Committee and Technical Working Groups who painstakingly labored in consolidating indicators into this manual that will guide all Hospital Administrators in the pursuit of one vision - *to make every hospital safe from disaster and accessible at all times for all disaster victims*. Likewise, this Manual signifies the continuing partnership between the Department of Health, World Health Organization, and other members of the health sector in making our health system strong, reliable and resilient for the Filipino people.


FRANCISCO T. DUQUE III, MD, Msc.
Secretary of Health

Preface

This Manual is a project of the Department of Health-Health Emergency Management Staff (DOH-HEMS) and National Center for Health Facility Development (DOH-NCHFD), with support from the Association of Hospital Administrators and the World Health Organization - Western Pacific Regional Office (WHO-WPRO).

Department Personnel Order 0254 s. 2008 mandated the Steering Committee to provide assistance and technical guidance to the different Technical Working Groups which determined, defined, and finalized the Structural Indicators, Non-structural, and Functional Indicators through a series of write-shops and critiquing sessions.

This Manual, however, neither provides nor claims to be the definite and only guide to follow in ensuring safety in health facilities. Therefore, this Manual refers the readers to other complementary references and documents.

Finally, this Manual is an evolving reference considering that every disaster is unique and that some standards may not be necessary, appropriate nor tailored to other health facility set ups.

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Introduction

Health facilities, whether hospitals or rural health clinics, should be a source of strength during emergencies and disasters. They should be ready to save lives and to continue providing essential health services such as laboratories, medicines, treatment and rehabilitation. They should also be the symbol of hope during these critical times and contribute to the community's sense of security and wellbeing.

The Hyogo Framework for Action in 2005 emphasizes the importance of "making hospitals safe from disasters by ensuring that all new hospitals are built with a level of resilience that strengthens their capacity to remain functional in disaster situations and implement mitigation measures to reinforce existing health facilities, particularly those providing primary health care."

The World Disaster Reduction Campaign on Hospitals Safe from Disasters (2008-2009) aims to raise awareness and effect change that will:

- Protect the lives of patients and health workers by ensuring the structural resilience of health facilities
- Make sure health facilities and health services are able to function in the aftermath of emergencies and disasters, when they are most needed
- Improve the emergency management capacity of health workers and institutions

This Manual defines a safe hospital and describes the essentials of a safe hospital. It also lists the structural and non-structural indicators as well as functional indicators which every hospital and clinic should consider as standards to be achieved.

What is a Safe Hospital?

Safe hospitals are health facilities whose services remain accessible and functioning, at maximum capacity and within the same infrastructure, during and immediately following disasters, emergencies or crises.

A safe hospital . . .

- ...will not collapse in disasters, killing patients and staff
- ...will be able to continue to function and provide critical services in emergencies
- ...will be organized, with contingency plans in place and health personnel trained to keep the network operational

What are the Essentials in Supporting Safe Hospitals?

Supporting safe hospitals involves knowledge of the many factors that contribute to their vulnerability, which include:

- **Buildings:** The location and design specifications and the resiliency of the materials used contribute to the ability of hospitals to withstand adverse natural events.
- **Patients:** A disaster will inevitably increase the number of potential patients.
- **Hospital beds:** In the aftermath of a disaster, the availability of hospital beds frequently decreases even as the demand for emergency care increases.
- **Medical and support staff:** The loss or unavailability of personnel disrupts the care of the injured; hiring outside personnel to sustain the response capacity adds to the overall economic burden.
- **Equipment and facilities:** Damage to non-structural elements can sometimes surpass the cost of the structure itself. Even when the damage is less costly, it can still force the hospital to halt operations.
- **Basic lifelines and services:** A hospital's ability to function relies on lifelines and other basic services such as electrical power, water and sanitation, and waste treatment and disposal. When some services are affected, the performance of the entire hospital suffers.















Supporting safe hospitals entails vision and commitment to ensure that they are fully functional especially in times of emergencies and disasters. There should be involvement of various sectors such as: planning, finance, public services, architecture and engineering.

Protecting health facilities includes:

- Ensuring risk reduction in the design and construction of all new health facilities
- Improving the non-structural and functional vulnerability of existing health facilities
- Adopting legislative and financial measures to select and retrofit the most critical facilities to increase levels of protection

What are the Structural Indicators of Safe Hospitals?

The structural elements of health facilities are essential elements that determine the overall safety of the building, such as foundations, columns, beams, slabs, load-bearing walls, braces, and trusses. The following is a list of structural indicators for safe hospitals in the Philippines based on the (1) National Structural Code of the Philippines (NSCP) Revised 2001 Guidelines, (2) National Building Code Revised 2006 Guidelines and (3) Association of Structural Engineers of the Philippines (ASEP) Recommended Guidelines on Structural Design Peer Review of Structures.









<i>Indicators</i>		
1.	Buildings are not at the edge of a slope or near the foot of a mountain vulnerable to landslide. The buildings are not near creeks, rivers or bodies of water that could erode its foundation.	 
2.	Design of building structural members (foundation, columns, beams, floor slabs, trusses) and non-structural members conform with NSCP 2001 for wind and earthquake design.	 
3.	Seismic Importance Factor of 1.25 and Wind Importance Factor of 1.15 have been applied in structural design.	 
4.	Immediate occupancy (operational) category as may be required by the client or Department of Health (DOH), right after an earthquake.	 
5.	No major structural cracks on structural members. Minor or hairline cracks investigated by a qualified civil/structural engineer and determined to be localized and repairable.	 
6.	Buildings are designed in accordance with NSCP 2001 requirements, up to Maximum Moment Magnitude 7 for those near Seismic Source Type A (active fault lines).	 
7.	Located at least ten (10) meters away from both sides of a fault line (refer to Department of Environment and National Resources geohazard maps or Philippine Institute of Volcanology and Seismology fault maps).	 

8.	Readily available and complete set of as-built construction drawings for reference purposes.		
9.	Complete with necessary building permits and occupancy permits.		
10.	Built with Fire-resistive and non-toxic materials.		
11.	Contains properly anchored cabinets, shelves, appliances, medical equipment and other movable equipment.		
12.	Curtain Glass walls conform with NSCP 2001 requirements for wind design.		
13.	Non structural elements such as glass doors and windows resist basic wind speed of 200 – 250 Kph with regional application of secondary covers.		
14.	Structural Design of proposed and existing buildings have undergone peer review using ASEP guidelines and issued with Structural certification before issuance of building permits.		
15.	For existing buildings, rapid evaluation using Department of Public Works and Highways guidelines has been performed to determine structural vulnerability of the buildings and crosschecked with hazard maps. Buildings identified as highly vulnerable subjected to detailed structural evaluation using ASEP guidelines.		
16.	Construction materials thoroughly checked by a Materials/Quality Assurance /Quality Control Engineer during construction for conformance to specifications.		
17.	All existing buildings certified by a qualified civil/structural engineer to conform with NSCP 2001. All buildings not in conformance with the present code analyzed and strengthened to conform with the code.		

What are the Non-structural Indicators of Safe Hospitals?

The non-structural elements are all other elements that, without forming part of the resistance systems, enable the facility to operate. They include architectural elements, equipment and contents and services or lifelines. In the case of hospitals, nearly 80% of the total cost of the facility is made up of non-structural components.











There are essential documents that should be available in connection with the non-structural indicators of safe hospitals, and these include:

<i>Documents/ Drawings/ Plans</i>		
1.	Owner's copy of the building's approved Construction Documents (i.e.Plans, Technical Specifications, Structural Computations) signed and sealed by appropriate professionals and submitted to and approved by the Building Official of the local government – This shows that the building has at least been designed by architecture and engineering professionals who will be liable and responsible for the integrity of the building in all its architectural and engineering aspects.	 
2.	As-Built Plans prepared by the Contractor or Builder; or As-Found Plans commissioned by Owners to be prepared by architecture and engineering professionals – This means that the hospital is conscious of knowing the building's innards as constructed and keeps a record for maintenance, upgrading and renovation.	 
3.	Updated As-Built Plans - This means that the hospital records the various renovations done and that succeeding designs for change/ renovation have bases and reference documents.	 
4.	Occupancy Permit - This certifies a building's compliance with applicable building codes and other laws, and indicates it to be in a condition suitable for occupancy.	 













The following are the indicators for the architectural elements, equipment and contents and services or lifelines.

A. Safety of the roofing









































A.1. Roofing system designed to withstand wind velocity of 175-250 Kph (as indicated in the NSCP 2001 Code):

A.1.a. Roofing materials completely and securely fastened, welded, riveted, or cemented		
A.1.b. Leak proof, water proof storm drainage system with adequate capacity and properly maintained		
A.1.c. Insulated, sound proof		
A.2. Considered type of material, slope, type of connection, condition, thickness at least gauge 24 or 26		
A.3. Considered regional location, e.g. in Bicol areas it should be heavily fastened or anchored		













B. Safety of ceilings

B.1. Concrete ceiling have no cracks and leaks		
B.2. Drop Ceilings made of materials other than concrete securely fastened		
B.3. Ceiling or light fixtures adequately fastened and supported		
B.4. Made of fire resistant ceiling materials such as: fiber cement board, fiber glass, acoustic/ gypsum board; wood materials are coated/ treated with fire retardant paints		
B.5. Underside of arches, balconies or overhangs free from structural cracks and falling cement plasters		
B.6. Other fixtures such as ceiling liner properly fastened or attached		















C. Safety of doors and entrances

C.1. Wind resistant and fire resistant		
C.2. Conformed with Fire Code of the Philippines latest edition		
C.3. With manual door closer - Operating Room (OR), Intensive Care Unit (ICU), Recovery Room (OR), Delivery Room (DR), Labor Room (LR), Isolation Rooms (IR) and other sterile areas		
C.4. Doors securely attached to jambs		
C.5. In the event of power failure, power-operated doors may be opened manually to permit exit travel.		
C.6. Main doors are double swing; in/out glass/ steel door; fire exit door		
C.7. Each single door with a width of not less than 112 cm. and not more than 122 cm. (Note: if power operated doors – in the event of power failure the door may be opened manually to permit exit travel)		
C.8. Fire exit doors fire resistive; swing - out type; with self enclosing device; panic bar hardware		
C.8.a. Bathroom - swing out		
C.8.b. ER - swing in and out		
C.8.c. All doors		
C.8.d. Automatic doors should have a manual override		
C.9. Doors in rooms below 50 persons occupant load capacity – single door – 112 cm wide		
C.10. Doors in rooms more than 50 persons occupant load capacity (conference rooms, function rooms), 112 cm wide, remotely located from each other, swing out		
C.11. Smoke partition doors are double swing, along hallways and corridors, per groups of rooms/section, for compartmentation purposes		
C.12. Any glass panel in doors is transparent wired glass mounted in steel frames		
C.13. In high rise buildings/structures, the interior vertical exit stairwell/staircase, is a pressurized fire exit or smoke proof fire exit, suitably sealed against smoke, heat and fire		
C.14. Locks installed on sleeping rooms so arranged that they can be locked only from the corridor side. Such locks arranged to permit exit from room by a simple operation without the use of key		
C.15. Any device or alarm installed to restrict the improper use of a means of egress so designed and installed that it cannot, even in case of failure, impede or prevent emergency use of such means of egress		
C.16. A door designed to be kept normally closed as a means of egress, such as a door to a stair or horizontal exit, provided with a reliable self-closing mechanism, and shall not at any time be secured in the open position. A door designed to be kept normally closed shall bear a sign as follows: FIRE EXIT, KEEP DOOR CLOSED		


D. Safety of windows and shutters

D.1. Windows have wind and sun protection devices (e.g. sun baffles)		
D.2. Windows have features to secure the safety of the patient (e.g. grilles)		
D.3. Grilles to secure the safety of the patient, provided with fire exit opening or fire protection system		
D.4. Windows are leak-proof		
D.5. Windows, which, because of their physical configuration or design and the materials used in their construction, could be mistaken for doors, made inaccessible to the occupants by barriers or railings		
D.6. Plastic laminated windows		







E. Safety of walls, divisions, partitions

E.1. Exterior walls meet the fire resistance rating of 2 hours		
• Reinforced, glass panels, concrete, steel and any fire resistive materials		
E.2. Room partitions made of fire resistive construction materials		
• Reinforced, glass panels, concrete, steel and any fire resistive materials		
E.3. Compartmented/ enclosed		
• Slab to slab (floor to floor) and fire resistive wall to wall		
E.4. Any institutional sleeping room which complies with the requirements of PD 1185, may be subdivided with non fire rated, non combustible partitions, provided, that the arrangement allows for direct and constant visual supervision by nursing personnel. Rooms which are so subdivided shall not exceed 465 square meters		

F. Safety of exterior elements (cornices, ornaments, facade, plastering, etc.)







































F.1. Securely fastened on walls		
F.2. Hanging lighting fixtures properly anchored		
F.3. Electrical wires and cables properly fastened/secured		
F.4. Plastering on fiber cement board at least 20 minute fire resistance rating		













































G. Safety of floor coverings

















































G.1. Non-slippery floor materials without crevices in all clinical/service areas and easy to clean floor materials in all other non clinical areas		
G.2. Reinforced concrete floor slabs		
G.3. Interior finish – with or without automatic fire suppression system, interior finish of walls and ceilings in means of egress and of any room shall be Class A in accordance with the “Method of Test of Surface Burning Characteristics of Building Materials, National Fire Protection Association (NFPA) Pamphlet No. 225” while floor finish materials shall be Class A or B throughout all hospitals, nursing homes and residential, custodial care facilities.		









































H. Safety of Lifeline Facilities







































H.1. Electrical System - must conform with the Philippine Electrical Code (PEC) Requirements for health facilities except for some provisions as may be required by the end-users







H.1.a. Emergency generator has the capacity to meet 100% of hospital demand (provision for back-up electrical system to include aircon units, and stockrooms)		
H.1.b. Higher distribution voltage such as 400/230 volts 3-phase 4-wire system should be considered to lower initial costs and gain greater long term efficiency		
H.1.c. Generator housing or power house protected from natural and man-made disasters		
• Housing should be made of reinforced concrete		
• Should be elevated from the ground line		
H.1.d. Generators and other vibrating equipment can be fixed by special brackets which allow some movement but prevent them from overturning		
H.1.e. Non vibrating and silent type generators		
• Exhaust system should be made of critical type silencer or hospital grade		
• Unit should be provided with vibration isolators (if generator is within the building of the hospital)		
H.1.f. Provided with generator automatic transfer switch (ATS)		
H.1.g. Used non-flammable cooling system for transformers, i.e. dry type, epoxy resin or silicon oil or high temperature R-Temp oil		
H.1.h. Used Bio Protection System (BPS) certified standard wire preferably with Thermoplastic High Heat-resistant Nylon (THHN) insulation and electrical cables securely fastened and tightly terminated on CBs or switches or wiring devices		
H.1.i. Protected control panel, enclosed circuit breakers, magnetic contactors and/or fused or non-fused switches		
H.1.j. Ground fault circuit interrupters (GFCIs) provided in outlets in bath/shower rooms and in wet or damp locations		
H.1.k. Convenience outlets (COs) provided with grounding pole		
H.1.l. Ducting system – Polyvinyl Chloride (PVC) for power and lighting; Rigid Steel Conduit (RSC) or Intermediate Metal Conduit (IMC) for fire alarm and detection systems; PVC for telephone, intercom Closed-circuit (CCTV), Cable TV (CATV), computer network data lines		
H.1.m. Ducting system for wires and cables followed the Philippine Electrical Code (PEC) standard		
H.1.n. Adequate lighting in all areas of the hospital		
H.1.o. Exterior electrical system installed underground		

H.1.p. Functional electrical and emergency lights with battery back-up in all critical areas		
H.1.q. Use energy saving Compact Fluorescent Lighting (CFL)		
H.1.r. Use non-mercury bulb/lights		
H.1.s. Automatic Monitoring system installed (Note: extension wires/chord – temporarily used must be unplugged when not in use)		
H.1.t. Exit lights luminous with battery back-up		
H.1.u. All non-current carrying metallic parts of the electrical system, i.e. electrical enclosures, boxes, gutters, ducts, trays, etc. adequately grounded		
H.1.v. Protected control panel, circuit breaker switch and cable (should follow the National Electrical Manufacturers Association (NEMA) standard) and protected by electrical surge suppressor		
H.1.w. Perimeter/Exterior lighting system installed in the hospital grounds		
H.1.x. Functional emergency lights in all areas		
H.1.y. All electrical systems/rooms protected with appropriate chemical type automatic fire suppression units		
H.2. Communication System		
H.2.a. Antennas and lightning rods protection terminals with bracing/support for safety		
H.2.b. Lightning protection terminals with pro-active operation features preferred		
H.2.c. Lightning arrester provided		
H.2.d. Radios have back up direct current power source (battery)		
H.2.e. Presence of back-up communication system		
H.2.f. Communication equipment and cables secured with anchors and braces		
H.2.g. Alarm signaling system arranged so that the normal operation of any required alarm initiating device will automatically transmit an alarm to the nearest fire station or to such other outside assistance as may be available		
H.2.h. Exterior communication systems installed underground		
H.2.i. Type NEMA 7 enclosures in Hazardous areas, Class I Division II, i.e. in Sewage Treatment Plants where methane gas is present and in Liquid Petroleum Gas (LPG)/ oxygen tanks storage area		
H.3. Water Supply System		
H.3.a. Water tank storage has sufficient reserve to satisfy the hospital demand for 3 days at all times		
H.3.b. Water storage tank has safe installation and location		
H.3.c. Alternate water source provided		
• Deep well		







• Local water utility		
• Mobile water storage tank		
• Fire truck		
H.3.d. Use of fusion weld pipes to prevent breakage and leaks		
H.3.e. Water distribution system (valves, pipes, connections) are free from leaks and harmful agents		
H.3.f. The wet standpipe shall deliver not less than one hundred thirty two (132) liters of water per minute at not less than one and eight – tenths (1.8) kilos per square centimeters residual pressure from each of any two outlets flowing simultaneously for 30 minutes. When more than one interior wet standpipe is required in the building, such standpipes may be connected at their bases or highest points by pipes of equal size.		
H.4. Medical Gas (oxygen, nitrous oxide, etc.) System		
H.4.a. For hospitals using pipe - in medical gas, they should have minimum storage of 7 days		
H.4.b. For hospitals using individual cylinders, they should have minimum storage of 3 days		
H.4.c. Provided anchors for tanks, cylinders and related equipment		
H.4.d. Available alternative sources of medical gases		
H.4.e. Safe and appropriate location for storage of medical gases and secured from theft, vandalism and preferage		
H.4.f. Ensured the safety of medical gas distribution system (valves, pipes, connections)		
• Provision of audio - visual alarm		
H.4.g. Functional pressure gauge and fittings		
H.4.h. Use of standard pipes (fire proof/water proof)		
H.4.i. Undergoes regular testing procedures		
H.4.j. Medical gas pipes embedded in walls are provided with pipe sleeves		
H.4.k. Non – interchangeable piping connection		
H.4.l. Provided zone/shut off valves in case of leaks, (example in case of fire at the OR complex, zone valve can be shut off)		
• Secured back up oxygen tanks in case of emergency patient evacuation		
H.4.m. Medical gases properly stored and secured in well ventilated areas or compartmented storage areas		
H.4.n. Industrial gases located outside the building and provided with automatic shut off device (e.g. LPG)		
H.4.o. Tanks bear an intact safety seal from the supplier		
H.4.p. Where hazardous processes or storage are of such a character as to involve an explosion hazard, explosion venting to outside the building shall be provided by thin glass or other approved vents		

H.4.q. All construction activity involving hazardous operation or processes shall have not less than 1 hour fire resistance and all openings between any buildings and rooms or enclosures for hazardous operation or processes shall be protected with self -closing or automatic fire doors		
H.5. Fire Suppression System		
H.5.a. Alarm, detection and extinguishing systems have interconnected Automatic Fire Alarm System, automatic heat and or detection system and automatic fire suppression system		
H.5.b. Fire Alarm system can be a combination of automatic and manual system		
H.5.c. Fire alarm system is monitored by Fire Service Station or Accredited monitoring agency		
H.5.d. Heat and Smoke Detection installed in corridors of hospitals, nursing homes and residential-custodial care facilities		
H.5.e. Smoke detectors must not be spaced further apart than nine meters on center and more than four and six-tenths (4.6) from any wall		
H.5.f. Used extinguishing agents that are environment-friendly, effective and cause less damage to property		
H.5.g. Each room provided with portable fire extinguishers		
H.5.h. Recommended fire extinguishers:		
• For electronic and electrical equipment, use CO2		
• For general services areas, use ABC fire extinguishers		
H.5.i. Provided with wet standpipe system with complete accessories		
H.5.j. Fire Safety Program		
• There must be an organized “Fire Brigade” which has undergone seminar/training on Fire Drill/ Fire Evacuation Drill/ Earthquake Drill		
• Conduct of regular Fire Drills/ Fire Evacuation Drill		
• Conduct of fire mitigation prevention and suppression training		
• Fire fighting equipment available		
• Conduct of preventive maintenance of fire fighting equipment		
• Available “Fire Exit Plan” and provision of Fire exit/evacuation plan in conspicuous places at every floor level		
H.6. Emergency Exit System		
H.6.a. The floors of beams of egress shall be illuminated at all points including angles and intersections of corridors and passageways, landings of stairs and exit doors with bulbs of not less than one thousandth (0.001) lumens per square centimeter		
H.6.b. Lighting source is of reasonably assessed reliability, such as public utility electric service		

















H.6.c. Emergency lighting facilities maintain the specified degree of illumination in the event of failure of the normal lighting for a period of at least one hour		
H.6.d. Illuminated "EXIT" signs – distinctive in color, reliable source – five thousandth lumens (0.005) per square centimeters		
H.6.e. Size of signs – plainly legible letters not less than fifteen centimeters high with the principal strokes of letters not less than nineteen millimeters wide		
H.6.f. Provide luminous directional exit signs located one foot or below floor level		
<i>I. Heating, Ventilation and Air conditioning (HVAC) Systems in Critical Areas</i>		
I.1. Provided adequate bracing for ducts and reviewed the flexibility of the ducts and piping that cross expansion joints		
I.2. Leak free piping, connections and valves		
I.3. Anchored central heating and/or hot water equipment		
I.4. Anchored central air-conditioning equipment		
I.5. Adequate safety provided for enclosures for HVAC equipment		
I.6. Equipment operational at all times (boiler, air-conditioning systems, exhaust, etc.)		
<i>J. Medical and Laboratory Equipment and Supplies used for Diagnosis and Treatment</i>		
• With color coded sign: For priority in saving during evacuation		
J.1. Medical Equipment in operating rooms and recovery rooms		
J.1.a. Equipment in the operating room mounted on rollers or roller trolleys must be anchored or fastened near the operating table during surgery and can be removed after		
J.1.b. Lamps, equipment for anesthesia and surgical tables are secured and that table or cart wheels are locked		
J.1.c. Equipment on roller trolleys must have proper anchoring system using hooks and chains, and may be attached to beds or walls (ECG, monitors, suction units, ventilators, incubators, BP monitors, resuscitation equipment, etc.)		
J.2. Radiological Equipment and other support devices on the Radiology Department (X ray units, ultrasound scanners, CT scanners, MRI scanners, etc)		
J.2.a. Heavy and movable equipment anchored or bolted on the floor (X ray machine) or to the wall (X ray tubes)		
J.2.b. Available steel frames for securing of equipment		
J.2.c. Adequately shielded room (radiation protection, radio-frequency, magnetic fields, etc.)		
J.2.d. Air conditioned room with controlled humidity		
J.2.e. Safe from flooding		

J.2.f. Well secured electrical outlets and good grounding system		
J.2.g. Proper segregation and storage of hazardous materials/chemicals		
J.2.h. Good water, plumbing and drainage system		





J.3. Laboratory Equipment and other support devices for the Laboratory Department/services

















































J.3.a. Supplies and contents of laboratories secured on shelves and in racks. (Anchor the cupboards to the walls and strap the shelves)		
J.3.b. Floors are without crevices		
J.3.c. Good ventilation, air conditioning and humidity controls		
J.3.d. Color coded bins for proper waste segregation		
J.3.e. Good water, drainage and plumbing systems		
J.3.f. Safe and well secured electrical wirings, outlets		
J.3.g. Safe and secured storage of reagents, culture organisms/media		
J.3.h. Tiles with grout and sealant regularly maintained		
J.3.i. Available standard decontamination area (fixed/mobile)		
J.3.j. Waste water disposed of to sewerage treatment plant		
J.3.k. Fume hood provided (depends on level of laboratory)		

J.4. Medical equipment in Emergency Rooms















J.4.a. Chaining of beds in all areas		
J.4.b. Each bed is provided with chains and anchor hooks		
J.4.c. Equipment and accessories needed for treatment and placed near the bed must be supported, anchored or fixed		
J.4.d. Anchor bolts should be provided on the walls in appropriate locations so that the equipment can be removed and fixed in a safe place when not in use		
J.4.e. Available steel frames for securing equipment		
J.4.f. Safe and well secured electrical wirings and outlets		
J.4.g. Supplies and contents of medical cabinets secured on shelves and in racks. (Anchor and strap the shelves to the wall)		
J.4.h. Equipment on roller trolleys must have proper anchoring system using hooks and chains, and can be attached to beds or walls (ECG, monitors, suction units, ventilators, incubators, BP monitors, resuscitation equipment, etc.)		

J.5. Medical equipment in ICU areas



























J.5.a. Chaining of beds in all areas		
J.5.b. Equipment and accessories needed for treatment and placed near the bed must be supported, anchored or fixed		

J.5.c. Anchor bolts should be provided on the walls in appropriate locations so that the equipment can be removed and fixed in a safe place when not in use		
J.5.d. Available steel frames for securing equipment		
J.5.e. Each bed is provided with chains and anchor hooks		
J.5.f. Equipment on roller trolleys must have proper anchoring system using hooks and chains, and can be attached to on beds or walls (ECG, monitors, suction units, ventilators, incubators, BP monitors, resuscitation equipment, etc.)		
J.5.g. Safe and well secured electrical outlets and wirings		
J.6. Medical equipment in the pharmacy departments		
J.6.a. Supplies and contents of pharmacy cabinets should be secured on shelves and in racks. (Anchor the cabinets to the walls and strap the shelves)		
J.6.b. Proper storage for hazardous materials and must be free from leaks		
J.6.c. Air-conditioned room or well ventilated		
J.6.d. Safe and well secured electrical outlets		
J.7. Medical equipment in the sterilization units		
J.7.a. Supplies and contents of sterilization unit cabinets should be secured on shelves and in racks. (Anchor the cabinets to the walls and strap the shelves)		
J.7.b. Safe and well secured electrical outlets		
J.7.c. Heavy and movable equipment anchored or bolted to the floor or to the wall (ex. autoclave)		
J.7.d. Clean and orderly, free from dirt and infectious materials		
J.8. Medical equipment in the wards		
J.8.a. Chaining of beds in all areas		
J.8.b. Each bed is provided with chains and anchor hooks		
J.8.c. Color coded bins for proper segregation of wastes		
J.8.d. Equipment and accessories needed for treatment and placed near the bed must be supported, anchored or fixed		
J.8.e. Anchor bolts should be provided on the walls in appropriate locations so that the equipment can be removed and fixed in a safe place when not in use		
J.8.f. Available steel frames for securing equipment		
J.8.g. Equipment on roller trolleys must have proper anchoring system using hooks and chains, and can be attached to beds or walls (ECG, monitors, suction units, ventilators, incubators, BP monitors, resuscitation equipment, etc.)		
J.8.h. Safe and well secured electrical outlets		
J.8.i. Well ventilated		
J.8.j. Well lighted		
J.8.k. Sterile medical equipment and supplies		









J.8.l. Patients' charts must be secured (especially if you have to evacuate that ward in times of emergencies) for proper / continuous management of patients		
J.9. Equipment and other support devices in Nuclear Medicine Department and Radiation Therapy Units (including Chemical/Poisoning)		
J.9.a. Adequately shielded room		
J.9.b. Air conditioned room		
J.9.c. Proper segregation and storage of hazardous materials/chemicals		
J.9.d. Chaining of beds in all areas		
J.9.e. Each bed is provided with chains and anchor hooks		
J.9.f. Equipment and accessories needed for treatment and placed near the bed must be supported, anchored or fixed		
J.9.g. Use of Proper Personal Protective Equipment (PPE)		
J.9.h. Available standard decontamination area (fixed/mobile)		
J.9.i. Waste water disposed of to sewerage treatment plant		
J.9.j. Use of Proper Illumination		
J.9.k. Adequate power supply (approx. 30KVA/unit)		
J.9.l. Independent circuit breaker		
J.9.m. Use of grounding requirements		
J.9.n. Should have a separate facility for the processing of the reagents/chemical substance, radio-pharmaceuticals and other diagnostic kits		
J.9.o. Proper storage, handling and disposal of chemicals and radioactive materials and wastes		
J.9.p. Asbestos free		
J.9.q. Proper anchorage of equipment and the materials used for the attachments should not cross react with the chemical agents		
J.9.r. Available decontamination room		
J.9.s. Presence of the following safety equipment:		
• Shields		
• Protective clothing		
• Tools for remote handling		
• Containers for radioactive materials		
• Dose rate monitors with alarm		
• Contamination meters		
• Signs, labels, records		
• Emergency kits		
J.9.t. Equipment and other support devices for the Radiotherapy department		

• Safe from flooding		
• Adequately shielded from the hazards of radiation		
• With good electrical power supply and grounding systems		
• With good ventilation, air conditioning and controlled humidity		
• With back up lighting system in case of brown outs		
• With area monitors complete with alarms		
• With radiation survey meters with audible warning		

K. Safety of Fixtures, Equipment and Supplies

K.1. Proper location/placement		
K.2. Chaining of beds in all areas		
K.3. Equipment and accessories needed for treatment and placed near the bed must be supported, anchored or fixed		
K.4. Anchor bolts should be provided in the walls in appropriate locations so that the equipment can be removed and fixed in a safe place when not in use		
K.5. Available steel frames for securing equipment		
K.6. Each bed is provided with chains and anchor hooks		
K.7. Safe and well secured electrical outlets		
K.8. No dangling fixtures/decorative ornaments		
K.9. No hanging fixtures by the bed of the patient		
K.10. Manual of Instructions/Users Manual available and accessible for all types of equipment		
K.11. Proper segregation and storage of hazardous materials/chemicals		
K.12. Material Safety Data Sheet (MSDS) available for all chemical substance		
K.13. Supplies and contents of laboratories, pharmacy, general stores, Central Sterilization Supply Department (CSSD) cabinets, and OR cabinets secured on shelves and in racks. (Anchor the cupboards to the walls and strap the shelves) and segregated in a way that they will not have interaction in case they are toppled during an earthquake		







































L. Security










L.1. Provided with Close Circuit TV (CCTV) cameras with recorder		
L.2. Available roving guard		
L.3. Secured entrance and exit points		
L.4. Provided with equipment for inspection such as metal detectors		













































M. Safety of personnel and patients

M.1. Available PPEs for universal precaution (gloves, masks, gowns)		
M.2. Available sterilizing equipment and supplies		
M.3. Available Information Education Communication (IEC) materials for patients and personnel on what to do during emergencies/disasters		














































What are the Functional Indicators of Safe Hospitals?







































<i>A. Site and Accessibility</i>		
A.1. A hospital shall be located along/ near good roads and adequate means of transportation		
A.2. A hospital shall be so located that it is readily accessible to the community and reasonably free from undue noise, smoke, dust, foul odor, flood, and shall not be located adjacent to railroads, freight yards, children's playgrounds, airports, industrial plants, disposal plants		
A.3. The location of a hospital shall comply with all local zoning ordinances		
A.4. There shall be no obstructions to the roads leading to the hospital		
A.5. There should be access to more than one road (alternative routes)		
A.6. There should be separate ingress and egress routes		
A.7. Well paved access roads should be properly identified/labeled		
A.8. Directional signages are available and properly fastened		
A.9. Corridors, hallways and aisles must be 2.4 meters in width.		
A.10. Use of ramps as access to second and higher floors		
A.11. Stairways with safe and adequately secured railings		
A.12. Stairway must be at least 112 cm. wide, concrete. Any opening in such wall shall be protected by fire doors or fixed wire glass windows. It must have protection for vertical openings		
A.13. Any door in a stairway, ramp, elevator shaft, light and ventilation shaft or chute, in a stairway enclosure shall be self-closing, and shall normally be kept closed		
A.14. Outdoor stairs must have enclosed and protected openings		
A.15. Available, safe and well lighted parking lots		
A.16. Available covered walk way, to interconnect service areas		
<i>B. Internal circulation and inter-operability</i>		
B.1. Nurses at the Stations can oversee the wards and are accessible to the patients		
B.2. Gender sensitive wards (female, male) and sanitary toilets		
B.3. Proper zoning of service areas		
B.3.a. Departments most closely linked to the community are located nearest to the entrance (OPD, ER, Admin., Primary Health Care		









































B.3.b. Departments that receive their workload from the wards or inner zones should be located closer to these zones (Radiology, Laboratory)		
B.3.c. In-patient departments should be in the inner zones		
B.4. Secured and controlled points of entry		
B.5. General service areas are located in separate structures such as power plant, boilers, water storage facilities, laundry area, and pump house		
B.6. Areas to be converted to spaces for patients during disasters properly identified with adequate lighting, electrical outlets, water supply and toilets/bathrooms		
B.7. Morgue is located separately from the service areas		
B.8. Diagnostic areas with heavy equipment are preferably at the ground floor but are safe from flooding		
B.9. Available/identified evacuation/holding area		
B.10. Laboratory, Radiology, and Radio therapy- medicine facilities are restricted areas		
<i>C. Basic Equipment and Supplies</i>		
C.1. Basic equipment should be available at least one set per ward or treatment area		
C.2. Inventory of these diagnostic and therapeutic basic equipment are functional and properly labeled		
C.3. Stock piling of medical supplies good for at least one week		
<i>D. Hospital Emergency Management Policies, Guidelines, Procedures, and Protocols</i>		
D.1. SOP/Guidelines on Infection Control		
D.2. Decontamination Procedures/Guidelines		
D.3. SOP for Internal and External Referral of patients		
D.4. Emergency Response Procedure/Guidelines		
D.5. Treatment Guidelines/Protocols		
D.6. Special Administrative Procedures for Disasters		
D.7. Procedures for Resource Mobilization (funds, logistics, human resources) to include shifting of duties during emergencies/disasters		
D.8. SOP for Admission to Emergency Department		
D.9. Procedures to Expand Services, spaces and beds, in case of surge of patients		
D.10. Procedures to Protect Patients' records		
D.11. Procedures for Regular Safety Inspection of equipment by appropriate authority and Preventive Maintenance		











D.12. Procedures for Hospital Epidemiologic Surveillance		
D.13. Procedures for Preparing Sites for Temporary Placement of Dead Bodies for forensic medicine		
D.14. Procedures for Transport and Logistic support		
D.15. SOP/guidelines for Food and Supplies of hospital staff during emergency		
D.16. Measures to ensure well being of additional personnel mobilized during emergency		
D.17. Procedures for Response during evening, weekend, and holiday shifts		
D.18. Guidelines for Mental Health and Psycho-social Support		
D.19. Guidelines on Drills / simulation exercises		
D.20. Handling of volunteers especially during emergencies/disasters		
D.21. Guidelines regarding firearms when visiting or going to the hospital, or others such as policemen visiting friends or relatives in the hospital or when they are on official business such as guarding a convicted patient		
D.22. Memorandum / Hospital Order / etc. to all hospital personnel to actively participate in drills and simulation exercises		
E. Hospital Systems - Building Related		
E.1. Logistics Management System		
E.1.a. System for estimating drug requirement, maintaining an inventory, storing and stocking, issuing and controlling the use of drugs		
E.1.b. Stockpile of emergency medicines and supplies		
E.1.c. Special arrangement with vendors/suppliers for emergency purchase in times of disaster		
E.1.d. Allotting contingency fund for emergency purposes		
E.1.e. System of rotating items that will expire first while placing on hold those with later expiration dates		
E.1.f. Process of allocating resources and recording utilization		
E.1.g. Presence of Emergency Kits		
E.1.h. Presence of adequate blood bank facility with SOP/guidelines on correct storage and handling of blood and blood products and quick procurement in times of emergency		
E.2. Water Supply System		
E.2.a. Presence of adequately safe and potable water in times of emergency at 5 liters/out-patient/day and 40-60 liters/in-patient/day and additional liters for laundry, flushing toilets and other utilities		
E.2.b. Presence of alternate source of water in case the main supply is cut off		
E.2.c. Identified agencies responsible for timely restoration of water service, supplementary pumping system in case system fails or services disrupted or for alternative water supply		

E.3. Electrical System

















E.3.a. System of how electric power is supplied to the hospital, higher distribution voltage such as 400/230 volts. Use of 3-phase 4-wire system should be considered to lower initial cost and gain greater long term efficiency		
E.3.b. Hospital's electric supply in terms of amperage or cyclage or kilowatts		
E.3.c. Consider using non-flammable cooling system for transformers, i.e. dry type, epoxy resin or silicon oil or high temperature R-Temp oil		
E.3.d. Location of control panels and power distribution lines should be marked in the floor plan		
E.3.e. Presence of emergency power generator or alternative power for emergency lighting and operation of essential equipment		
E.3.f. Generating set should be located on the premises but not adjacent to the OR or ward areas		
E.3.g. Recommended circuits to which emergency power should be provided: Lighting:		
• All exits, including exit signs, stairways and corridors		
• Surgical, obstetrical and RR, ER operating (OR) lights		
• Nursery, laboratory, recovery room, ICU, nursing stations, labor room, and pharmacy		
• Generator set location, electrical switch-gear location, and boiler room		
• One or two elevators, if needed for emergency		
• Telephone operator's room		
• Computer room		
Equipment:		
• Nurses' call system		
• Alarm system, including fire alarm		
• Fire pump for central suction system		
• Blood bank refrigerator		
• Equipment in operating, recovery, intensive care and delivery rooms		
• One electrical sterilizer if installed		
• Sewerage or pump lift system		
• Equipment necessary for maintaining telephone service and two-way radio base system		
Heating, cooling, and ventilation system:		
• OR, DR, LR, RR, ICU, Nurseries, Neonatal Intensive Care Units (NICU), and patients' rooms		
E.3.h. Emergency lights with battery back-up should be available for use during the period of transfer switching (the period between the interruption of power supply and the connection to a generator set) to light important areas inside the hospital such as stairs, and hallways, OR, ER, ICU, RR, NICU Nurses' stations and cashier area. They should not substitute for the generator		

E.3.i. Type NEMA 7 enclosures in Hazardous areas, Class I Division II, i.e. in Sewage Treatment Plants where methane gas is present and in LPG/oxygen tanks storage area		
E.4. Medical Gases Distribution System		
E.4.a. Properly maintained medical gasline		
E.4.b. Gas tanks and /or medical gas pipes regularly inspected		
E.4.c. For piped-in gases, there should be safety valves installed to prevent leakage		
E.4.d. Available leak alarm system and locator		
E.5. Early Warning System and Safety Equipment		
E.5.a. Signs in the hospital should indicate the location of escape routes and fire-fighting equipment		
E.5.b. There should be a building layout diagram provided for easy identification; designates evacuation site for each hospital ward		
E.5.c. There should be smoke detectors at proper intervals covering the entire building		
E.5.d. Regular check ups of the smoke detectors to ensure that these are functioning and they have adequate power supply		
E.5.e. Available, visible, and accessible equipment for local fire control which includes fire hoses and fire extinguishers which should be placed strategically, in corridors, exit routes, and at the entrances to high-risk rooms such as laboratories		
E.5.f. Regular maintenance of the fire extinguishers, the contents of which expire over time and must be replaced regularly		
E.5.g. Compliance to guidelines for proper placement of fire detectors and fire fighting equipment		
E.5.h. Personnel training on how to use the fire extinguishers		
<i>F. Hospital System - Functions - Related</i>		
F.1. Security System		
F.1.a. Available security unit (private and/or organic) in the hospital		
F.1.b. SOP/Protocol on tightening of security in certain high-risk areas such as the main entrance and exit points, storage areas for controlled substances and volatile chemicals, and areas containing high-value medical equipment		
F.1.c. Repository of firearms upon entering the hospital		
F.1.d. Provision to recall / call to duty off-duty guards during emergencies and disasters		
F.1.e. Memorandum of Understanding / coordination with the barangay chair and members to assist the hospital during emergencies and disasters		
F.2. Transportation and Communication System		
F.2.a. Available back-up communication facilities (cellular phone, handheld radios, satellite communication facilities, etc)		

F.2.b. Available equipped ambulances for transport of casualties from the field to the hospital, for moving patients to other facilities in cases of referral or overload, or for evacuating and relocating a hospital service		
F.2.c. List of identified available and capable ambulances for use during emergency		
F.2.d. List of equipment, medical supplies, emergency drugs and training of personnel in the ambulance		
F.3. Public Information System		
F.3.a. Presence of established Public Information Center where public can go to request information concerning family members		
F.3.b. Public Information Center is coordinated by a social worker and staffed by personnel or volunteers		
F.3.c. Training on risk communication of Public Information Officer (PIO)		
F.3.d. Available public awareness and public education campaign with warning messages or risk communication		
F.3.e. Procedures for communicating with the public and media		
F.4. Hospital Emergency Incident Command System		
F.4.a. The Chief of Hospital as the Incident Commander and other staff to fill up the position of the Incident Command Structure		
F.4.b. System of activating and deactivating the Incident Command System		
F.4.c. With uniform, ID and job description sheet (JDS)		
F.4.d. Available operation center (OC) and an alternate OC		
F.5. Hospital Early Warning and Code Alert System		
F.5.a. Hospital alert in order for hospital to prepare and mobilize resources in response to early warning signs or signals		
F.5.b. System of recalling of staff and positioning them for possible response to emergencies		
F.5.c. System of activating and deactivating the Code Alert		
F.6. Information Management System		
F.6.a. Preparation of a census of admitted patients and those referred to other hospitals		
F.6.b. Proper recording and reporting using standard forms		
F.6.c. Ways of sharing information with proper authorities		
F.6.d. Information management system during monitoring of events in emergency/disaster		
G. Operational Plan and Contingency Plans for Internal or External Disasters		
G.1. The hospital must have available, accessible, tested, updated and disseminated Hospital Emergency Preparedness, Response and Recovery Plan which contains Hazard Prevention and Mitigation Plan, Vulnerability Reduction Plan and Capacity Development Plan. This plan includes the developed systems, guidelines, SOPs and protocols for emergency management		











G.2. This includes evacuation plan in times of emergency		
G.3. Plan for expansion of services in times of sudden surge of patients		
G.4. Procedures to activate and deactivate the plan		
G.5. Cooperative arrangements with local emergency plans		
G.6. Contingency Plans for medical treatment during different types of disasters such as Typhoon, Floods, Earthquake, Fire, Disease outbreaks, Emerging and Re-emerging Infections/Diseases, Biological, Chemical, Radio-nuclear terrorism, Control of Infections acquired during hospitalization, pathogens with epidemic potential, etc.		

H. Manuals for the Operation, Preventive Maintenance, and Restoration of Critical Services











H.1. Electrical supply and back-up generators		
H.2. Drinking water supply and alternate source of drinking water		
H.3. Fuel reserves		
H.4. Medical gases		
H.5. Standard and back-up communication systems		
H.6. Wastewater Treatment		
H.7. Solid Waste Treatment		
H.8. Fire suppression		

I. Human Resources





I.1. Organization of Hospital Disaster Committees and Emergency Operation Center

I.1.a. Crisis Management Committee – Committee lower than the Executive Committee, with technical expertise, who could give advice to the Executive Committee regarding crisis/emergency/disaster management		
I.1.b. Emergency Response Team to be led by a designated Hospital Emergency Management Coordinator and composed of Physicians, Nurses, Emergency Management Technician (EMT) trained staff, Paramedics, trained Ambulance Driver on emergency/disaster		
I.1.c. Health Emergency Planning Group – Responsible for the development of Health Emergency Preparedness, Response and Recovery Plan and other hospital response plans		
I.1.d. Safety Committee to be headed by a Safety Officer. The committee is in charge of promoting safety in the hospital from all types of hazards		
I.1.e. Hospital Operation Center to be headed by the Hospital Emergency Management Coordinator, in charge of monitoring incidents of emergency or disaster, dispatching of response teams, mobilizing other resources for emergency, operational 24 hours a day and seven days a week. It has a designated office or unit with personnel equipped with communication facilities, and computer system, directories, with alternate communication system in case the system bogs down		





















I.2. Capability Building of Personnel

I.2.a. 100% of health workers trained in Basic Life Support and Cardio-pulmonary Resuscitation Standard First Aid		
I.2.b. 100% of health workers trained in Standard First Aid		
I.2.c. Emergency Room medical staff trained in Advance Cardiac Life Support and Pediatric Advance Cardiac Life Support		
I.2.d. Hospital Responders trained in Emergency Medical Technician Course Incident Command System (ICS), Mass Casualty Incident (MCI)		
I.2.e. Hospital managers must be trained in Hospital Emergency Incident Command System (HEICS)		







I.3. Drills and Exercises

I.3.a. Conduct of Fire drills at least twice a year		
I.3.b. Conduct of simulation drills or exercises at least once a year		







































J. Availability of medicines, supplies, instruments, and other equipment for Disasters








































J.1. Emergency Medicines at the Emergency Room and in the critical service areas (OR, RR, ICU, NICU,etc.)		
J.2. Items for treatment and other supplies		
J.3. Instruments for emergency procedures		
J.4. Medical gases		
J.5. Ventilators		
J.6. Electro-medical equipment		
J.7. Life support equipment		
J.8. Personal Protective equipment for epidemics (disposable)		
J.9. Crash cart for cardio-pulmonary arrest		
J.10. Triage tags and other supplies for managing mass casualties		

K. Monitoring and Evaluation

K.1. Post-incident evaluation of emergencies or disasters responded to		
K.2. Evaluation of Fire Drill at least twice a year		
K.3. Evaluation of emergency simulation exercise or drill at least one a year		

ADDITIONAL SPECIFIC NON- STRUCTURAL INDICATORS FOR HOSPITALS WITH SPECIAL FUNCTIONS






I. Hospital For Highly Infectious Diseases		
A. Isolation Room/ Biological Unit/Negative Pressure Room		
<i>A.1. Ceiling/Windows/Doors and Entrances</i>		
A.1.a. Closed, air tight windows and doors		
A.1.b. Glass transparent doors for the ante room and the room of the patient, tightly closed		
A.1.c. Automatic shut off doors, swing type, of the ante room and the room of the patient, tightly closed		
A.1.d. Leak proof ceiling, windows and doors		
A.1.e. With signage "ISOLATION"		
<i>A.2. Divisions/Partitions</i>		
A.2a. Isolation room has an ante room for dressing with Personal Protective Equipment (PPE)		
A.2.b. Ante room has lavatory and PPE rack		
<i>A.3. Floor Covering</i>		
A.3.a. Reinforced concrete		
A.3.b. Non-slippery floor tiles without crevices		
<i>A.4. Attachments</i>		
A.4.a. Heating, Ventilation and Air conditioning (HVAC)		
• No air-conditioning		
• No electric fan		
A.4.b. Pipes/Medical Gases		
• Closed, built in pipes		
A.4.c. Fixtures and Equipment		
• No nebulizer		
• No Oxygen tank; to be used only in "life and death situation"		
• No suction machine (dedicated)		
• Minimized dedicated equipment: only life saving equipment		
• Lavatory of ante room with foot operated trash bin, soap dispenser, and disinfectant dispenser; while the faucet is sliding that can be operated/opened by pushing of the elbow		
• Color coded trash bins		
• Refrigerator near the Nurses' Station for storage of biological specimens and culture media		

A.4.d. Electrical Lighting		
• Well lighted		
• Back-up emergency lights		
A.5. Lifeline Facilities (Critical Systems)		
A.5.a. Communication System		
• Dedicated 2 telephone lines for inside and outside communication		
A.5.b. Water supply System		
• Safe and adequate water supply in all areas		
• Water tank storage has sufficient reserve to satisfy the hospital demand for three days		
• Water containers for storage in the ante room		
A.5.c. Medical Gases, pipes (oxygen, nitrous oxide, etc.)		
• Sufficient storage for minimum of 15 day supply		
• Securely anchored tanks, cylinders and related equipment		
• Protection of medical gas tanks and/or cylinders and related equipment		
• Functional pressure gauge		
• Leak proof		
• Medical gas pipes not embedded in walls		
• Individualized piping system		
• Automatic shut off mechanism in case of leaks		
A.5.d. Emergency Exit System		
• Exclusive Emergency Exit		
• Illuminated "EXIT" signs – distinctive in color (Reliable source – five thousand lumens (0.005) per square centimeters		
• Provide luminous directional exit signs located one foot or below floor level		
A.6. Heating, Ventilation and Air Conditioning Systems		
A.6.a. Negative pressure room		
A.6.b. Exhaust system with filter that exits into the open air far from human activity		
A.6.c. Airtight		

B. OPERATING ROOM AND RECOVERY ROOM

B.1. Medical and Laboratory Equipment and Supplies used for Diagnosis and Treatment

B.1.a. Medical equipment in operating room and recovery room









<ul style="list-style-type: none"> Dedicated equipment mounted on rollers or roller trolleys must be anchored or fastened near the operating table during operations and can be removed afterwards 		
<ul style="list-style-type: none"> Lamps, equipment for anesthesia and surgical tables are secured and table or cart wheels are locked 		
<ul style="list-style-type: none"> Equipment on roller trolleys must have proper anchoring system using hooks and chains, and can be attached to beds or walls (ECG, monitors, suction units, ventilators, incubators, BP monitors, resuscitation equipment, etc.) 		

B.1.b. Safety of Radiology Equipment

<ul style="list-style-type: none"> Dedicated portable mobile X ray machine that is battery operated 		
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C. Laboratory Room – (P3 Laboratory and Bio-safety and Bio-security)

C.1. Safety of Laboratory Equipment









C.1.a. Safe washing area		
C.1.b. Available standard decontamination area, (fixed/mobile)		
C.1.c. Hospitals maintain lab as per their category (Category 3)		
C.1.d. Manual on collection, transport, storage, and handling of specimen		

C.2. Safe Laboratory Room



C.2.a. Adequate Facilities















































<ul style="list-style-type: none"> Good and proper ventilation 		
<ul style="list-style-type: none"> Non-slip surfaces (floor & working areas) 		
<ul style="list-style-type: none"> Hand-washing facilities 		

C.2.b. Safety Equipment








<ul style="list-style-type: none"> Personal Protective Equipment (PPE) 		
<ul style="list-style-type: none"> i. Gowns 		
<ul style="list-style-type: none"> ii. Goggles 		
<ul style="list-style-type: none"> iii. Mask 		
<ul style="list-style-type: none"> iv. Gloves 		
<ul style="list-style-type: none"> Safety devices on laboratory 		
<ul style="list-style-type: none"> Safety Laboratory Equipment – Biosafety Cabinet Class II 		

























C.2.c. Emergency Equipment











































<ul style="list-style-type: none"> Fire extinguishers 		
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• Emergency showers		
• Eye wash station		
C.2.d. Appropriate Procedures		
• Good housekeeping		
• Personal hygiene (handwashing)		
• Laboratory safety protocol		
C.2.e. Proper Storage Area (secured/anchored)		
• Properly stored ordinary reagents/chemicals		
• Non-corrosive building materials for acid-containing chemicals and reagents		
• Dedicated storage for pathogenic organisms accessible only to responsible people		
C.2.f. Proper Laboratory Holding		
• P3 laboratory - negatively pressurized environment for highly contagious organisms		
C.2.g. Decontamination Area		
• Fixed autoclave		
• Mobile autoclave		
C.2.h. Knowledgeable Workers		
• Experienced		
• Trained		
<p>IF POSSIBLE: All laboratory doors should be labeled with emergency contact information. If an accident occurs during office hours, respondents need to know the names and telephone numbers of people responsible for laboratory operations. Properly trained and experienced laboratory workers have the greatest ability to control laboratory risks.</p>		
D. Emergency Room		
D.1. Safety of medical equipment in Emergency Room		
D.1.a. Separate ER		
D.1.b. Dedicated supplies and equipment for diagnosis and treatment		
D.1.c. Disposable PPEs (masks, goggles, gowns, caps, gloves, booties)		
E. Security And Safety		
E.1. Provision of Close Circuit TV (CCTV) cameras with recorder		
E.2. Secured entrance and exit points		
E.3. Available appropriate PPEs (gloves, N95 masks, goggles, gowns, booties, caps)		
E.4. Available dedicated sterilizing equipment and supplies		
E.5. Dedicated staff assigned in Isolation Room/Biological Unit		
E.6. Signages for restricted areas		

ADDITIONAL FUNCTIONAL INDICATORS FOR HOSPITALS FOR HIGHLY INFECTIOUS DISEASES

A. Site and Accessibility		
A.1. Properly identified/labeled Isolation Room/Biological Unit		
A.2. Directional signages available and properly fastened		
A.3. Admitted cases have separate entrance to the Isolation room/ER from the rest of the hospital patients and personnel		
B. Internal Circulation and Inter-Operability		
B.1. There is a dedicated Isolation Room/Biological Unit for highly infectious cases (i.e. SARS, Avian Flu)		
B.2. There is a dedicated ER/Consultation Room for highly infectious patients away from the usual ER and OPD		
B.3. Presence of decontamination areas near the entrance at the ER, at the laboratory, and at the Isolation Room/Biological Unit		
B.4. Nurses at the Stations can oversee the patients inside the Isolation Room/Biological Unit		
B.5. Gender based wards (female, male) and common sanitary toilets		
B.6. Observe proper zoning: Isolation Room/Biological Unit must be secured, regulated, and located in the hospital away from the busy wards		
B.7. Identified safe perimeter for patients and personnel with proper signage (3 meters away from the door of Isolation Room/Biological Unit)		
C. Equipment and Supplies		
C.1. Dedicated equipment and supplies for the Isolation Room/Biological Unit/ER		
C.2. Dedicated portable X ray, ventilators, diagnostic and treatment tools (i.e Stethoscope, laryngoscope, BP apparatus, etc)		
C.3. Laboratory has bio-safety cabinet with hood		
C.4. Available special PPEs like N95 masks, goggles, caps, gowns, gloves, booties, all of which are disposable		
C.5. Hand lotion and disinfectants		
C.6. Proper waste disposal materials/supplies		
D. Hospital Plans		
D.1. Hospital Contingency Plan for Highly Infectious Disease Outbreak		
D.2. Hospital Contingency Plan for Bioterrorism		
E. Hospital Emergency Management Policies, Guidelines, Procedures, and Protocols		
E.1. SOP/Guidelines on Infection Control		
E.2. Decontamination Procedures/Guidelines		
E.3. Bio-safety and Bio-security Guidelines		

E.4. SOP for internal referral of patients		
E.5. Treatment Guidelines/Protocols for Emerging/Re-emerging Infections		
E.6. Procedures for hospital epidemiologic Surveillance		
E.7. Procedures for preparing sites for temporary placement of dead bodies for highly infectious disease		
E.8. SOP/Guidelines for food and supplies of dedicated hospital staff during emergency		
F. Hospital Systems		
F.1. Logistics Management System		
F.1.a. System for prioritizing hospital personnel to be given prophylactic/therapeutic drugs for highly infectious diseases in times of drug scarcity		
F.1.b. Surveillance System		
<ul style="list-style-type: none"> Established hospital disease surveillance system for the patients and personnel 		
F.1.c. Water Supply System		
<ul style="list-style-type: none"> Presence of adequately safe water at all times even during emergency for hygienic purpose, for flushing toilets and other utilities 		
<ul style="list-style-type: none"> Presence of alternate source of water in case the main supply is cut off 		
<ul style="list-style-type: none"> Identified agencies responsible for timely restoration of water service 		
<ul style="list-style-type: none"> Supplementary pumping system in case system fails or services disrupted 		
F.1.d. Electrical System		
<ul style="list-style-type: none"> Presence of emergency power generator or alternative power for emergency lighting and operation of essential equipment 		
F.1.e. Security System		
<ul style="list-style-type: none"> Dedicated security personnel 		
<ul style="list-style-type: none"> Tightened security of the Isolation Room/Biological Unit, being a restricted area 		
<ul style="list-style-type: none"> Only authorized personnel are allowed to enter 		
<ul style="list-style-type: none"> Separate entrance or access route 		
<ul style="list-style-type: none"> With proper signages 		
F.1.f. Transportation and Communication System		
<ul style="list-style-type: none"> Available back-up communication facilities (cellular phone, handheld radios satellite communication facilities,etc) 		
<ul style="list-style-type: none"> Dedicated ambulance for highly infectious patients with glass separator between the driver and the patient compartment equipped with proper decontamination/disinfection supplies and materials 		

F.1.g. Public Information System		
• Presence of established Public Information Center where public can go to request information concerning family members		
• Public Information Center is coordinated by a social worker and staffed by personnel or volunteers		
• Available public awareness and public education campaign with advisories, IECs, warning messages		
• Designated spokesperson for risk communication		
• Procedures for communicating with the public and media		
F.1.h. Hospital Emergency Incident Command System (HEICS)		
• The Chief of Hospital as the Incident commander and other staff to fill up the position of the Incident Command Structure		
• System of activating and deactivating the Incident Command System		
• System of activating the Hospital Response Plan		
• Hospital Early Warning and Code Alert System in order for hospital to prepare and mobilize resources in response to early warning signs or signals		
• System of recalling of staff and positioning them for possible response to emergencies		
• System of activating and deactivating the Code Alert System		
F.1.i. Information Management System		
• Preparation of a census of admitted patients and those referred to other hospitals		
• Proper recording and reporting using standard forms		
• Ways of sharing information with proper authorities		
G. Operational Plan and Contingency Plans for internal or external disasters		
G.1. The hospital must have available, accessible, tested, updated and disseminated Hospital Emergency Preparedness, Response and Recovery Plan and Contingency Plan for Highly Infectious Diseases (SARS, AI) This plan includes the developed systems, guidelines, SOPs and protocols for emergency management		
G.2. Procedures to activate and deactivate the plan		
H. Plans for the Operation, Preventive Maintenance, and Restoration of Critical Services		
H.1. Electrical supply and back-up generators		
H.2. Drinking water supply		
H.3. Fuel reserves		
H.4. Medical gases		
H.5. Standard and back-up communication systems		

H.6. Wastewater Treatment		
H.7. Solid waste Treatment		
H.8. Fire suppression system		
I. Human Resources		
I.1. Organization of Hospital Disaster Committees and Emergency Operation Center		
I.1.a.Crisis Management Committee		
I.1.b.Dedicated trained and competent staff in managing highly infectious cases		
I.1.c.Dedicated trained and competent security personnel		
I.1.d.Dedicated trained and competent Ambulance drivers		
I.1.e.Dedicated trained and competent maintenance/utility personnel		
I.1.f. Dedicated trained and competent Safety Committee members		
I.1.g.Dedicated trained, competent, and active Infection Control Committee		
I.1.h.Hospital Operation Center staff – to be headed by the Hospital HEMS Coordinator, to be operational 24 hours a day and seven days a week		
I.2. Capability Building of Personnel		
I.2.a.100% of staff trained on management of highly infectious diseases		
J. Availability of medicines, supplies, instruments, and other equipment dedicated for highly infectious diseases (SARS, AI)		
J.1. Emergency Medicines at the Emergency Room and in the critical service areas (OR, RR, ICU, NICU, etc)		
J.2. Items for treatment and other supplies		
J.3. Instruments for emergency procedures		
J.4. Medical gases		
J.5. Ventilators		
J.6. Electro-medical equipment		
J.7. Life support equipment		
J.8. Personal Protective equipment for epidemics (disposable)		
J.9. Crash cart for cardio-pulmonary arrest		
J.10. Triage tags and other supplies for managing mass casualties		
K. Monitoring and Evaluation		
K.1. Conduct of post-incident evaluation of emergencies or disasters responded		
K.2. Conduct of drills		

Additional Indication for Fire Safety of Hospitals

A. CONSTRUCTION MATERIALS:

Should be fire resistive, non-combustible construction materials. Reinforced concrete, concrete products, steel/ metal products, glass, cement boards, gypsum boards.

B. CEILINGS:

As much as possible, provision for ceiling is not recommended. This is due to the fact that ceiling serves as hiding place for rats that gnaws the electrical system and where waste combustible materials are accumulated. Any concealed space between the ceiling and the floor or roof above shall be fire proof for the full depth of the space along the line of support of the floor or roof structural members.

C. DOORS:

All doors facing hallways/ corridors should be made of fire resistive materials with self-closing mechanism or equipped with automatic door closer. Doors should be kept closed but not locked.

D. FIRE EXIT DOORS:

Shall be made of fire resistive materials of least 2 hour fire rating, self-closing with panic hardware and swinging to the direction of exit travel. Components should conform to accepted standards and/ or recognized fire test laboratory. Should be maintained closed but not locked. Edges should be suitably sealed, provided with fire resistive door strip and smoke stoppers as protection against smoke, heat and fire. Doors shall have an adequate opening (width and height) that can accommodate bed lying patients in case of fire or emergencies. Power assisted door shall be easily operable manually to permit exit travel in case of power failure.

E. COMPARTMENTATION:

Interior walls, partitions on rooms and corridors/ hallways shall reach slab to slab without openings. Pipe penetrations should be suitably sealed with concrete plastering or approved fire resistive sealant/ collars/ pillows.

F. OPENING ON WALLS ALONG CORRIDORS/ HALLWAYS:

No openings/ windows shall be made on all walls along corridors/ hallways. Only door openings are allowed provided it is a fire resistive door and with self-closing mechanism.

G. VERTICAL OPENINGS:

Shall be protected with at least 4 hours fire resistive construction materials. Openings shall be provided with self-closing, fire resistive doors/ covers. (e.g. Dumb waiter, garbage chute, linen chute, lifter)

Pipe penetration against walls and floors shall be suitably sealed with concrete plastering or approved fire resistive sealant/ collars/ pillows.

Fire exit doors shall be at least 2 hour fire resistive, exit swinging self-closing with panic hardware. Door components should conform to accepted standards or recognized fire test laboratory.

H. INTERIOR RAMPS/ ELEVATORS/ ESCALATORS:

Shall be protected with approved, pre-designed and engineered automatic fire sprinkler system.

ICUs, MICUs, NICUs, Nursery, OPERATING ROOMS, DELIVERY ROOMS:

Shall be located preferably on rooms/ areas on the ground floor or street level due to the incapacity of the patients for self-evacuation and the need for life support system/s equipment.

I. SIGNS/ SIGNAGE:

The building exit signs should be of approved type and strategically located. Proper exit marking should be provided in order to assist occupants, patients especially visitors that are not familiar where exits/ fire exits are located.

Signs/ signage shall be made in accordance with the Fire Code Regulations, easily readable from farthest area. Corner points should be provided with directional arrow to where exits/ fire exits are.

Rooms shall be provided with FIRE EXIT EVACUATION FLOOR PLAN showing exit routes of the building, to be prominently displayed on doors inside rooms.

J. EMERGENCY LIGHTING:

Rooms, hallways, corridors, stairs, fire exit stairs, lobbies, exit discharge areas and other exit ways shall be provided with portable AC/DC emergency lighting.

Generators should be equipped with automatic transfer switch with less than ten (10) seconds delay on transfer to automatic operation.

K. AUTOMATIC FIRE SUPPRESSION SYSTEM/ SPRINKLER SYSTEM:

Automatic fire suppression system (Fire Sprinkler System) shall be provided throughout the building (two storey and above). Shall be approved with internationally recognized or accepted standard, so installed and continuously maintained in reliable operating condition as to provide complete coverage for all portions of the premises protected. It must also protect all floor spaces including spaces in every closet and concealed spaces and plenums of certain configuration and construction – particularly where combustible materials are located such as exposed electrical wiring, combustible duct work, and combustible sound/ thermal insulation.

The system shall be provided with adequate and reliable water supplies as approved by the Bureau of Fire Protection.

The system shall be provided with a water flow alarm device and interconnected to a fire alarm system and to the control room of the building.

The system shall be maintained with approved facilities to ensure that it is properly operating. It shall be electrically connected to a continuously manned control station or to a fire department headquarters to give automatic notice of any closed water valve or other condition that might interfere with the operation of the system, including but not limited to flow of water in the system due to fire or other cause. Such facilities shall provide for immediate alarm to the fire department in case of fire or suspected fire, for appropriate immediate action to restore the sprinkler system to operative condition.

L. FIRE PUMPS:

Shall be Underwriters Labs/ Factory Mutual (NFPA 2001) listed/ accredited.

At least 75.0 horsepower on low to medium rise buildings. Capacity should be increased if it involves protection of high rise or large scale buildings.

Fire pumps shall be approved and shall deliver not less than the required water flow and pressure. Such pumps shall be supplied with adequate power source and shall be automatic in operation.

M. FIRE HOSE CABINETS:

Each wet standpipe outlet shall be supplied with a hose not less than thirty eight (38) mm in diameter. Such hose shall be equipped with approved variable type nozzle. An approved hose reel rack or cabinet shall be provided and shall be located so as to make it accessible. The hose reel rack or cabinet shall be recessed to the wall or protected by suitable cabinets.

N. FIRE DETECTION AND ALARM SYSTEM (FDAS):

Every building shall have an electrically supervised and maintained automatic fire detection and alarm system capable of being manually operated in accordance with Fire Code. It shall be installed with provision for connection to the nearest Fire Service Station in the locality. Internal audible and visual alarm device shall be provided. Pre signal systems shall not be permitted in institutional occupancies.

The system shall be installed in all corridors of hospitals, nursing homes, residential custodial care facilities in accordance with the applicable standards of NFPA 2001 Pamphlet No. 71 or 72, but in no case smoke detectors be spaced further apart than nine (9) meters on center or more than four and six-tenths (4.6) meters from any wall and electrically inter-connected to the fire alarm system.

O. PORTABLE FIRE EXTINGUISHERS:

An approved and appropriate type of portable and wheeled type fire extinguishers shall be provided in accordance with the Fire Code of the Philippines.

SERVICE ROOMS:

Dietary, canteen, laboratory, laundry/ linen, sterilization, carpentry shops, woodworking shops, motor pools, cooking/ heating/ burning areas where open flames are being used, other high hazard rooms where materials are highly flammable, combustible, explosive, radio active, corrosive chemicals, compressed air/ oxygen or gases are kept or stored shall be located on separate areas or buildings. They shall be constructed of fire resistive construction materials. Approved and appropriate type of automatic and manual fire suppression equipment, fire detection and alarm system shall also be provided and interconnected with the fire alarm system of the building.

LPG (Liquefied Petroleum Gas) cylinders/ tanks:

They shall be kept or stored outside building premises with proper concrete segregation, ventilation, cooling/ fire suppression system and be provided with a device that will automatically shut-off the supply of gas in case of leakage or other troubles and gas leak detector with alarm interconnected to the fire alarm system of the building.

P. SEPTIC TANKS/ SEWAGE TREATMENT PLANTS:

Shall be located away from any building. Shall not be constructed on basement or under any building and shall be maintained properly.

Q. FIRE COATS, HELMETS, BOOTS, and other Fire Fighting equipment.

Members of the fire brigade team shall be provided with proven safe fire coats, helmets, boots, hand gloves while conducting rescue or fire and other emergency operations. Gears and other equipment such as but not limited to ropes, ceiling hooks, spare fire hoses, sprinklers, portable fire extinguishers, self-contained breathing apparatus (SCBA) and tanks, flashlights with fresh batteries, two-way radios with chargers, building plans/ floor plans shall be kept in an approved emergency bin or cabinet and be used exclusively during fire/ emergencies only.

R. PLANS, DESIGNS, SPECIFICATIONS:

The plans, designs or specifications of the proposed building to be constructed, repaired, renovated, altered, modified and changed in use shall be referred also to other proper local government agency/ unit for their comment and recommendation as follows:

City Building Official as to National Building Code requirements (PD-1096)

City/ Municipal Fire Marshal as to Fire Code of the Philippines requirement (PD-1185)

City Electrician/ Electrical Division as to Philippine Electrical Code

Engineering/ Industrial Safety Division as to Mechanical Code of the Philippines

Sanitary/ Plumbing Official as to Sanitary Code of the Philippines

Environmental or Pollution Management Office as to environment protection and management requirements

Other regulating and safety enforcement agencies/units

Note: Even government projects are not exempted from securing the proper permits/ certificates. Payment of fees due may be exempted