The creation of a health care environment,
Design, Construction and Operationalizing the EOC

Functional Program &
Safety Risk Assessment

Understanding the role of FGI Guidelines, Part 1
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- B Arch - Pratt Institute
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- Center for Health Design - Environmental Standards Council - Functional Program Narrative
Learning Objectives:

• Part 1 of the FGI Guidelines and its impact on the Hospitals role in operationalizing the EOC
• Understand the evolution of Planning, Design, Construction & Commissioning from 1987 - 2018
• The 2010 - 2018 FGI Guidelines Part 1 impact on the role of the Hospital in the PDC process
• Understand The Functional Program
• Understand the SRA - ICRA, PCRA, PHAMA and other assessments that form the SRA
• Other considerations that integrate into the operationalizing and design processes
• Roles, responsibilities, creating the MDT
• How to implement FGI Guidelines, Part 1 requirements into a project
FGI Guidelines a Historical Review - PDC

• 1987 - 2018

• An evolutionary development of minimum standards

• 1987 recognition that construction in healthcare facilities may jeopardize patient safety

• 2018 broad based standards requiring multiple levels of assessment integrated into a process overseen by a MDT

Part 1 of the FGI Guidelines defines the process by which the governing authority and multi-disciplinary teams that are assigned to a project create and operationalize an environment of care.

5. CONSTRUCTION

5.1 Construction Phasing

Projects involving alterations and/or additions to existing buildings should be programmed and phased to minimize disruptions of retained, existing functions. Access, exits, and fire protection shall be so maintained that the occupants' safety will not be jeopardized during construction.

5.2 Nonparticipating Conditions

It is not always financially feasible to modernize the entire existing structure in accordance with these standards. In such cases, authorities having jurisdiction may grant approval to renovate portions of the structure if facility operation, handicapped access, and patient safety in the renovated areas are not jeopardized by the existing features of sections retained without complete corrective measures. In major modernization projects and additions to existing facilities, those unrenovated areas that do not comply with NFPA 101 requirements for existing buildings, shall be separated from sections to be modernized by fire walls or partitions rated not less than two-hour fire resistance, extending through the full height of the building, and by labeled fire doors of class "B" 1½-hour construction.

6. RECORD DRAWINGS AND MANUALS

6.1 Drawings

Upon occupancy of the building or portion thereof, the owner shall be provided with a complete set of legible drawings showing construction, fixed equipment, and mechanical and electrical systems, as installed or built. Drawings shall include a fire protection plan for each floor reflecting NFPA 101 requirements.

6.2 Equipment Manuals

Upon completion of the contract, the owner shall be furnished with a complete set of manufacturers' operating, maintenance, and preventive maintenance instructions; parts lists; and procurement information with numbers and a description for each piece of equipment. Operating staff shall also be provided with instructions on how to properly operate systems and equipment. Required information shall include energy ratings as needed for future conservation calculations.

6.3 Design Data

The owners shall be provided with complete design data for the facility. This shall include structural design loadings; summary of heat loss assumption and calculations; estimated water consumption; and electric power requirements of installed equipment. All such data shall be supplied to facilitate future alterations, additions, and changes, including, but not limited to, energy audits and retrofit for energy conservation (see appendix).

Construction

- Minimize Disruption
- Phased Construction
- Access, Exits and Fire Protection
- Occupant Safety During Const.

Record Drawings and Manuals

- Provide complete set of dwgs.
- Show fixed equipment
- Show MEP systems
- Include fire protection plans
1996/1997

5. CONSTRUCTION

5.1 Planning and Design
Continual health care facility upgrades through renovation and new construction of hospital facilities can create conditions which can be hazardous to patients. Design and planning for such projects in the health care facilities shall require consultation from infection control professionals and safety personnel. Early involvement in the conceptual phase will help ascertain the risk assessment for susceptible patient location and disruption of essential patient services. Control for clean to dirty airflow, interruption of utility and/or building/equipment services, and communication requirements shall be specified in the project bid documents in order to ensure construction specification compliance.

5.2 Phasing
Projects involving renovation of existing buildings shall include phasing to minimize disruption of existing patient services. This phasing is essential to ensure a safe environment for patient care areas. Phasing will include assurance for clean to dirty airflow, emergency procedures, criteria for interruption of protection, construction of roof surfaces, written notification of interruptions, and communication authority. The effects of noise and vibration will affect patients, and procedures must be planned accordingly. The renovation areas shall be isolated from the occupied areas during construction using air-tight barriers, and exhaust airflow shall be sufficient to maintain negative air pressure in the construction zone. Air quality requirements shall be maintained as described in Tables 2 and 6.

5.3 Commissioning
Acceptance criteria for mechanical systems shall be specified. Crucial ventilation specifications for air balance and filtration shall be verified before Owner acceptance. Areas requiring special ventilation include surgical services, protective environments, airborne infection isolation rooms, laboratories, and local exhaust systems for hazardous agents. These areas shall be recognized as requiring mechanical systems that ensure infection control, and ventilation deficiencies shall not be accepted. Acceptance criteria for local exhaust systems dealing with hazardous agents shall be specified and verified.

5.4 Nonconforming Conditions
It is not always financially feasible to renovate the entire existing structure in accordance with these Guidelines. In such cases, authorities having jurisdiction may grant approval to renovate portions of the structure if facility operation and patient safety in the renovated areas are not jeopardized by the existing features of sections retained without complete corrective measures.

Commissioning
- Specify Acceptance Criteria
- Verify before occupancy
- Areas of special ventilation-deficiencies

Planning and Design
- Conditions hazardous to patients
- Consultation Infection Control
- Consultation with Safety
- Early involvement, Risk Assessment
- Clean to dirty airflow
- Interruption of Utilities, Building Equip.
- Bid document specification

Phasing
- Phasing to minimize disruption
- Safe patient care environment
- Clean to dirty airflow
- Written notice of interruptions
- Effect of noise and vibration on patients
- Isolation of renovation area
- Air tight barriers, exhaust airflow
- Prescriptive air quality requirements
Planning and Design

- Provisions for infection control
- Protection of patients
- Upgrades can create hazards
- Infection Control Risk Assessment
- Continuous process - EOC
- ICRA conducted by panel
- Incorporate ICRA into CD’s
- ICRA initiated in design and planning
- **ICRA continues through construction**
  - Impact of disruptions
  - Patient placement/relocation
  - Placement of barriers
  - Air handling and ventilation needs
  - Determination of numbers of All Rms.
  - Consideration of domestic water
  - Protect patients from const. activities
  - Protect patients from shutdowns
**2001**

**CONSTRUCTION**

- Phasing
  - Essential to ensure safety
  - Assurance of clean to dirty
  - Emergency procedures
  - Interruption of protection
  - Written notification of interruption
  - Consideration of noise and vibration
  - Isolation using air tight barriers
  - Maintain negative pressure

- Maintain air quality for occupied areas

- **Commissioning**

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**APPROXIMATE**

4.1 (Attached to the domestic water system to limit Legionella sp. and waterborne opportunistic pathogens) The assessment for internal and/or external construction projects also includes patient protection from demolition, ventilation and water management following planned or unplanned power outages, movement of debris, traffic flow, cleanup, and certification.

5.2 Phasing

5.2.1. Projects involving renovation of existing buildings shall include phasing to minimize disruption of existing patient services. This phasing is essential to ensure a safe environment in patient care areas.

5.2.2. Phasing will include assurance for clean to dirty airflow, emergency procedures, criteria for interruption of protection, construction of roof surfaces, written notification of interruptions, and communication authority.

5.2.3. Phasing class shall include considerations of noise and vibration control that result from construction activities.

5.2.4. Renovation areas shall be isolated from occupied areas during construction using airtight barriers and exhaust airflow shall be sufficient to maintain negative air pressure in the construction zone.

5.2.5. Existing air quality requirements and other utility requirements for occupied areas shall be maintained.

5.3 Commissioning

Acceptance criteria for mechanical systems shall be specified. Final ventilation specifications for air

Reference Note: In 2002 the ASHE Infection Control Risk Assessment Matrix of Precautions for Construction and Renovation underwent its first update from original publication.
2006

1.5 Planning, Design, and Construction

Appendix material, which appears in shaded boxes at the bottom of the page, is advisory only.

1 General Considerations

1.1 Applicability
The provisions of this chapter shall apply to all health care facility projects.

1.2 Instrument of Care Considerations
Facility construction, whether for remodeling buildings or expansion and/or renovation of existing buildings, can create conditions that are harmful to patients and staff. For that reason, health care facility planning, design, and construction activities shall include—in addition to consideration of space and operational needs—consideration of provisions for infection control, life safety, and protection of occupants during construction.

1.2.1 Infection Control Risk Assessment (ICRA)
During the planning phase of a project, after considering the facility’s patient population and programs, the owner shall provide an infection control risk assessment. An ICRA is a determination of the potential risk of transmission of various air- and waterborne biological contaminants in the facility.

1.2.2 Owner Recommendations
Based on the ICRA, the owner shall provide the following:

2 Infection Control Risk Assessment Process

2.1 General

2.1.1 ICRA Panel
The ICRA shall be conducted by a panel with expertise in infection control, direct patient care, risk management, facility design, construction and construction planning, ventilation, safety, and epidemiology.

2.1.2 Continuous Updates
The ICRA panel shall provide updated documentation of the risk assessment together with updated mitigation recommendations throughout planning, design, construction, and commissioning.

2.1.3 Monitoring
The owner shall also provide monitoring of the effectiveness of the applied ICRA during the course of the project.

2.2 ICRA Considerations
The ICRA shall address, but not be limited to, the following:

Moved to Chapter 1 & Expanded

• Applicability
• EOC
• Owner Recommendations
• ICRA - Assessment Process
• Design
• Construction
• Risk Mitigation
• Project Requirements
• Infection Control Monitoring
• Phasing - Renovation - Isolation

Applies to all healthcare facilities

Expanded language on the EOC

ICRA - Developed by stakeholder groups

ICRA Panel

Continuous Updates by ICRA panel

Monitoring during course of project
• **Design**
  - Building Design Feature considerations
  - All Rooms
  - Locations of special ventilation
  - Special AHU needs
  - Water systems
  - Finishes and surfaces

• **Construction**
  - Consideration of building and site areas
  - Impact of disruptions
  - Determination of hazards
  - Location of patients
  - Impact of outages and shut downs
  - Assessment of activities
  - Hazards

• **Infection Control Risk Mitigation**
  - Publish risk mitigation recommendations
  - Patient displacement
  - Barrier standards
  - Temporary provisions for HVAC & Water
  - Protection from demolition.
  - Training Staff, Visitors and Const. Personnel

• Incorporate into project requirements
Infection Control Monitoring

- Provide continuous monitoring
- Monitoring by in house or consultant
- Include written procedures for:
  - Emergency suspension
  - Protective measures
  - Responsibilities of parties

Renovation

- Phasing
- Phasing provisions
- Noise and Vibration
- Isolation
- Measurement of Air Quality

Commissioning

Reference Note: In 2009 the ASHE Infection Control Risk Assessment Matrix of Precautions for Construction and Renovation underwent its last update from original publication. This matrix has not been revised in 10 years.
## ASHE Matrix

### Step Two:
Using the following table, **identify the Patient Risk Groups** that will be affected.
If more than one risk group will be affected, select the higher risk group:

<table>
<thead>
<tr>
<th>Low Risk</th>
<th>Medium Risk</th>
<th>High Risk</th>
<th>Highest Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office areas</td>
<td>Cardiology</td>
<td>CCU</td>
<td>Any area caring for</td>
</tr>
<tr>
<td></td>
<td>Echocardiography</td>
<td>Emergency Room</td>
<td>immunocompromised patients</td>
</tr>
<tr>
<td></td>
<td>Endoscopy</td>
<td>Labor &amp; Delivery</td>
<td>Burn Unit</td>
</tr>
<tr>
<td></td>
<td>Nuclear Medicine</td>
<td>Laboratories</td>
<td>Cardiac Cath Lab</td>
</tr>
<tr>
<td></td>
<td>Physical Therapy</td>
<td>(specimen)</td>
<td>Central Sterile Supply</td>
</tr>
<tr>
<td></td>
<td>Radiology/MRI</td>
<td>Medical Units</td>
<td>Intensive Care Units</td>
</tr>
<tr>
<td></td>
<td>Respiratory Therapy</td>
<td>Newborn Nursery</td>
<td>Negative pressure isolation rooms</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Outpatient Surgery</td>
<td>Oncology</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pediatrics</td>
<td>Operating rooms</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pharmacy</td>
<td>including C-section rooms</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post Anesthesia Care Unit</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Surgical Units</td>
<td></td>
</tr>
</tbody>
</table>

### Step Three: Match the **Patient Risk Group** (Low, Medium, High, Highest) with the planned ...
**Construction Project Type** (A, B, C, D) on the following matrix, to find the ...
**Class of Precautions** (I, II, III or IV) or level of infection control activities required.
**Class I-IV or Color-Coded Precautions** are delineated on the following page.

## IC Matrix - Class of Precautions: Construction Project by Patient Risk

<table>
<thead>
<tr>
<th>Patient Risk Group</th>
<th>TYPE A</th>
<th>TYPE B</th>
<th>TYPE C</th>
<th>TYPE D</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW Risk Group</td>
<td>I</td>
<td>II</td>
<td>II</td>
<td>III/IV</td>
</tr>
<tr>
<td>MEDIUM Risk Group</td>
<td>I</td>
<td>II</td>
<td>III</td>
<td>IV</td>
</tr>
<tr>
<td>HIGH Risk Group</td>
<td>I</td>
<td>II</td>
<td>III/IV</td>
<td>IV</td>
</tr>
<tr>
<td>HIGHEST Risk Group</td>
<td>II</td>
<td>III/IV</td>
<td>III/IV</td>
<td>IV</td>
</tr>
</tbody>
</table>

Note: Infection Control approval will be required when the Construction Activity and Risk Level indicate that Class III or Class IV control procedures are necessary.

### Take Note:
The risk assessment matrix became over time a standard by which assessment of impact of work, patient risk group and class of precautions was evaluated.

However, as the SRA process has vastly expanded in scope, this may not be the tool needed to manage contemporary requisites.
1.2 Planning, Design, Construction, and Commissioning

1.2.1 General

The provisions of this chapter shall apply to all health care facility projects.

*1.2.1.1 Application*

The provisions of this chapter shall apply to all health care facility projects.

*1.2.1.2 Planning, Design, and Implementation Process*

The multidisciplinary teams shall include, at minimum, administrators, clinicians, infection preventionists, design professionals, architects, facility managers, safety officers, users of equipment, and support staff whose roles are affected by the scope of the project and as determined by the organization.

*1.2.1.3 Environment of Care and Facility Function Considerations*

The environment of care and facility function considerations shall include:

- Infection Control
- Patient Safety
- Patient Handling
- Movement
- Life Safety
- Protection of Occupants

*1.2.1.3.1 Framework for Health Facility Design*

The design team shall include but not be limited to facility administrators, clinicians, infection preventionists, safety officers, support staff, patient advocates, consumers, and construction specialists.

*1.2.1.3.2 Introduction of Functional Program*

Introduction of Functional Program

- Planning, Design, and Implementation
- Multi-Disciplinary team
- Add stakeholders as scope dictates

*1.2.1.3.3 Introduction of Patient Safety Risk Assessment*

Introduction of Patient Safety Risk Assessment

- Design influences outcomes
- Framework - primary mission is health
- First do no harm
- Renovation can harm patients
- Design and construct to mitigate

*1.2.1.3.4 Introduction of PHAMA*

Introduction of Design Considerations & Requirements

- Infection Control
- Patient Safety
- Patient Handling
- Movement
- Life Safety
- Protection of Occupants
1.2 Functional Program

1.2.1 Functional Program Requirement

The health care provider shall supply a functional program for each facility project. (Activities such as projects that only involve equipment replacement, fire safety upgrades, or minor renovations that will not change the facility’s function or character shall not require a functional program.)

1.2.2 Functional Program Outline

A functional program for the facility shall describe the following:

1.2.2.1 Purpose of the Project

1.2.2.1.1 Required services. A description of those services necessary for the complete operation of the facility shall be provided in the functional program.

1.2.2.2 Environment of Care Components

The relationships between the following environment of care components (including key elements of the physical environment) and the functional requirements shall be addressed in the functional program.

- 1.2.2.2.1 Delivery of care model (conceptual)
  - The delivery of care model shall be defined in the functional program.
  - The functional program shall support the delivery of care model to allow the design of the physical environment to respond appropriately.

- 1.2.2.2.2 Facility and service users (people).
  - The physical environment shall support the facility and service users in their effort to administer the delivery of care model.

- 1.2.2.2.3 Systems design.
  - The physical environment shall support organizational, technological, and building systems designed for the intended delivery of care model.

- 1.2.2.2.4 Layout/operational planning.
  - The layout and design of the physical environment shall enhance operational efficiencies and the satisfaction of patients or residents, families, and staff.

- 1.2.2.2.5 Physical environment.
  - The physical environment shall be designed to support the intended delivery of care model and address the key elements listed below:

  1. Light and views. Use and availability of natural light, illumination, and views shall be considered in the design of the physical environment.

1.2.2.2.3 Lay/operational planning.

1.2.2.2.4 Layout/operational planning.

1.2.2.2.5 Physical environment.

1.2.2.2.6 Space and equipment needs.

1.2.2.2.7 Short and long term planning.

1.2.2.2.8 Use for design and const. documents.

1.2.2.2.9 Retain with design data for future use.
Infection Control Risk Assessment

- Ties back to the Functional Program
- Shall be part of integrated PDC activities
- Must be conducted during early planning
- Must continue through project const. & comm.
- Shall be conducted by a team
- ICRA must be incorp. into Functional Program
- Must dictate design elements
- Surfaces and furnishings
- Construction elements, impacts, hazards
- Maintain documentation
- Monitoring plan and procedures
- Updates shall be provided by team
- Changes shall be shared with team
- Must include mitigation planning
- Must establish standards, barriers, etc.
- Temporary provisions, shutdowns, etc.
- Provisions for construction workers.
2010

1.2 PLANNING, DESIGN, CONSTRUCTION, AND COMMISSIONING

1.2.3.4.1.4 Protection from demolition

1.2.3.4.1.5 Measures to be taken to train hospital staff, visitors, and construction personnel

1.2.3.4.1.6 The impact of potential utility outages or emergencies, including protection of patients during planned and unplanned utility outages

1.2.3.4.1.7 The impact of movement of debris, traffic flow, cleanup, elevator use for construction materials and construction workers, and construction worker zones

1.2.3.4.1.8 Provision for use of bathrooms and food facilities by construction workers

APPENDIX (CONTINUED)

Introduction of the PSRA & PHAMA

Patient Safety Risk Assessment
• Resides only in the Appendix

Patient Handling & Movement Assessment
• Conducted to assist design team
• Incorporate equipment into EOC
• Increase mobility, independence, strength
• Staff safety
• Two distinct phases, Assessment & Design
• Bariatric and non-bariatric patients
• Responsibility of healthcare provider
• Must provide to the design team

PHAMA Process:
• Needs Assessment
• Equipment recommendations
• Equipment types, quantities, capacities
• Locations
• Design Considerations
• Structure, Electrical, Mechanical
• Spatial provisions, Doors, Finishes
• ICRA requirements
Introduction of Design Considerations and Requirements

- Design Considerations and Requirements
  - Acoustic Design
  - Site Exterior Noise
  - Acoustical Finishes
  - Room Noise Levels
  - Interior Wall & Floor/Ceiling Const.
  - Speech Privacy
  - Building Vibration

- Sustainable Design
  - Site selection and development
  - Waste minimization
  - Water conservation
  - Energy efficiency
  - Indoor environmental quality
  - Building materials
  - Reduction of greenhouse gas

- Wayfinding
- Bariatric-Specific Design
- Provisions for Disasters
1.2 PLANNING, DESIGN, CONSTRUCTION, AND COMMISSIONING

2010

1.2-7 Renovation

1.2-7.1 Renovation

Projects involving renovation of existing buildings shall include planning to minimize disruption of existing patient services. This planning is essential to ensure a safe environment in patient care areas.

1.2-7.2 Renovation

During renovation, renovation areas shall be isolated from occupied areas based on the IORA.

1.2-7.3 Maintenance of Air Quality and Utilities

Existing air quality requirements and other utility requirements for occupied areas shall be maintained during any renovation or construction.

1.2-7.4 Nonconforming Conditions

It is not always financially feasible to renovate an existing structure in accordance with these Guidelines. Therefore, authorities having jurisdiction shall be permitted to grant approval to renovate portions of a structure if facility operation and patient safety in the renovated areas are not jeopardized by existing features of sections retained without complete corrective measures.

1.2-7.5 Existing Conditions

Existing conditions and operations shall be documented prior to initiation of renovation and/or new construction projects. This shall include documentation of existing mechanical/electrical/structural capacities and quantities.

1.2-7.6 Phasing

Projects involving renovation of existing buildings shall include planning to minimize disruption of existing patient services. This planning is essential to ensure a safe environment in patient care areas.

1.2-7.7 Phasing Provisions

Phasing provisions shall include assurance for clean to dirty airflow, emergency procedures, criteria for interruption of protection, construction of roof surfaces, written notification of interruptions, and communication authority.

1.2-7.8 Noise and Vibration

Phasing plans shall include considerations of noise and vibration control that result from construction activities.

1.2-7.9 Isolation

During renovation, renovation areas shall be isolated from occupied areas based on the IORA.

1.2-7.10 Maintenance of Air Quality and Utilities

Existing air quality requirements and other utility requirements for occupied areas shall be maintained during any renovation or construction.

1.2-7.11 Nonconforming Conditions

It is not always financially feasible to renovate an existing structure in accordance with these Guidelines. Therefore, authorities having jurisdiction shall be permitted to grant approval to renovate portions of a structure if facility operation and patient safety in the renovated areas are not jeopardized by existing features of sections retained without complete corrective measures.

1.2-7.12 Existing Conditions

Existing conditions and operations shall be documented prior to initiation of renovation and/or new construction projects. This shall include documentation of existing mechanical/electrical/structural capacities and quantities.

Expansion of Renovation, Commissioning and Record Drawings Requirements.

• Renovation
• Phasing
• Phasing Provisions
• Noise and Vibration
• Isolation
• Maintenance of Air Quality and Utilities
• Nonconforming Conditions

• Commissioning
• HVAC Systems
• Plumbing Systems

• Record Drawings & Manuals
• Drawings
• Equipment Manuals
• Design Data
• Structural
• Heat loss calculations
• Est. water consumption
• Medical gas outlet listing
• Applicable codes
• Elec. power req. of installed equip.
Introduction of the Multidisciplinary Project Team

• Multidisciplinary Team
  • Moved to front of PDC
  • Shall include all stakeholders

Functional Program Reorganized

SRA integrates ICRA & PHAMA

SRA Expanded

EOC Requirements Introduced

Commissioning Expanded

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2014

1.2 Planning, Design, Construction, and Commissioning

Appendix material, shown in shaded boxes at the bottom of the page, is advisory only.

1.2-1 General

*1.2-1.1 Application

The provisions of this chapter shall apply to all health care facility projects.

*1.2-1.2 Multidisciplinary Project Team

Multidisciplinary groups/persons (stakeholders) affected by and integral to the design shall be included in the project planning and implementation process.

1.2-1.2.1 At minimum, the multidisciplinary team shall include administrators, clinicians, infection preventionists, architects and other design professionals, facility managers, safety officers, security managers, users of equipment, and support staff relevant to the areas affected by the project as well as those with knowledge of the organization’s functional goal for the project.

1.2-1.2.2 The scope and nature of the project shall dictate others involved.

*1.2-1.3 Environment of Care and Facility Function Considerations

*1.2-1.3.1 Framework for Health Care Facility Design

1.2-1.3.1.1 Because the built environment has a profound effect on health, productivity, and the natural environment, health care facilities shall be designed within a framework that recognizes the primary mission of health care (including “first, do no harm”) and that considers the larger context of enhanced patient environment, employee effectiveness, and resource stewardship.

1.2-1.3.1.2 Facility construction, whether for freestanding buildings, expansion, or renovation of existing buildings, can create conditions that are harmful to patients and staff. Thus, new health care buildings and renovations need to be designed and constructed to facilitate ongoing cleanliness and mitigate infection control concerns. For these reasons, health care facility planning, design, construction, and commissioning activities shall include—in addition to consideration of space and operational needs—consideration of components in the safety risk assessment as well as life safety and protection of occupants during construction.
1.2-2 Functional Program

1.2-2.1 General

1.2-2.1.1 Functional Program Requirement

1.2-2.1.1.1 A functional program shall be developed for new construction, major renovations, and projects that change the functional use of any facility space.

1.2-2.1.1.2 The governing body shall be responsible for developing, documenting, and updating the functional program.

1.2-2.1.1.3 Activities such as equipment replacement, fire safety upgrades, or minor renovations that will not change the facility’s function or character shall not require a functional program.

1.2-2.1.2 Functional Program Purpose

1.2-2.1.2.1 The functional program shall be used to determine the application of the Guidelines when developing facility projects.

   (1) The functional program shall be completed as part of the project planning phase and updated, as needed, throughout the design and construction phases.

   (2) Following its approval, the functional program shall serve as the basis for the project design and construction documents.

1.2-2.1.2.2 The facility shall retain the functional program with other design data to facilitate future alterations, additions, and program changes.

1.2-2.1.3 Nomenclature in the Functional Program

1.2-2.1.3.1 The names for spaces and departments used in the functional program shall be consistent with those used in the Guidelines for Design and Construction of Hospitals and Outpatient Facilities. If acronyms are used, they shall be defined clearly.

1.2-2.1.3.2 The names and spaces indicated in the functional program shall also be consistent with those used on submitted floor plans.

1.2-2.2 Functional Program Content

The functional program for a project shall include the following:

1.2-2.2.1 Functional Program Executive Summary

An executive summary of the key elements of the functional program shall be provided and, at minimum, shall include the information outlined in Section 1.2-2.2 (Functional Program Content) in a project narrative.

1.2-2.2.2 Purpose of the project. Services to be provided, expanded, or eliminated by the proposed project shall be described.
The functional program shall contain a list organized by department or other appropriate functional unit that shows each room in the proposed project, indicating its size by gross floor area and clear floor area and citing relevant paragraph number(s) from this document.

**2014**

**Safety Risk Assessment (SRA)**

*1.2-3* Safety Risk Assessment (SRA)

*1.2-3.1* General

1.2-3.1.1 SRA Requirement

1.2-3.1.1.1 All health care facility projects shall be designed and constructed to facilitate the safe delivery of care.

1.2-3.1.1.2 To support this goal, an interdisciplinary team shall develop a safety risk assessment.

1.2-3.1.2 SRA Components

The SRA components identified in Table 1.2-1 (Safety Risk Assessment Components) shall be required.

1.2-3.1.3 SRA Responsibility and Scope

1.2-3.1.3.1 The safety risk assessment shall be initiated and managed by the governing body during the planning phase of the project and shall continue to evolve with additional levels of detail as needed to support the creation of a safe environment throughout the design, construction, and commissioning phases of a project.

1.2-3.1.4 SRA Team

1.2-3.1.4.1 Composition. The safety risk assessment shall be conducted by an interdisciplinary team appointed by the governing body.

*1.2-3.1.4.2* Team members and roles

1. Members of the SRA team shall be convened as a group as needed to maintain continuity and integration of the SRA components.
2. Individual members shall be engaged to develop additional detail according to their areas of expertise.

*1.2-3.1.5* SRA Process

1.2-3.1.5.1 Identify hazards and potential risks. The governing body shall provide an assessment of the potential harm to patients, caregivers, and other users for the risks listed in Table 1.2-1 (Safety Risk Assessment Components), identifying the following:

1. Hazards specific to the project
2. Historical data and/or national patient and caregiver safety trends relevant to the hazards identified
EOC Requirements

- Address during PDC:
  - Delivery of Care Model Concept
  - Patient, Visitor, Physician, Staff
  - Accommodation
  - Flow
- Building Infrastructure and Systems
- Physical Environment Elements
  - Light
  - Views of and access to nature
  - Wayfinding
  - User control of environment
  - Privacy and Confidentiality
  - Security
  - Surfaces, Details, Furnishings
  - Cultural Responsiveness

1.2.4 Environment of Care Requirements

The functional requirements for the space being designed and the relationships between the following environment of care components and key elements of the physical environment shall be addressed during project planning, design, and construction.

1.2.4.1 Delivery of Care Model Concepts

1.2.4.1.1 A description of the delivery of care model shall be provided.

1.2.4.1.2 A description of the physical elements and key functional relationships necessary to support the intended delivery of care model shall also be provided.

1.2.4.2 Patients, Visitors, Physicians, and Staff Accommodation and Flow

Design criteria for the following shall be described:

1.2.4.2.1 The physical environment necessary to accommodate facility users and administration of the delivery of care model

1.2.4.3 Building Infrastructure and Systems Design Criteria

Design criteria for the physical environment necessary to support organizational, technological, and building systems that facilitate the delivery of care model shall be described.

1.2.4.4 Physical Environment Elements

Descriptions of and/or design criteria for the following shall be included:

1.2.4.4.1 Light

How the use and availability of natural light and illumination are to be considered in the design of the physical environment

1.2.4.4.2 Views of and Access to Nature

How the use and availability of views and other access to nature are to be considered in the design of the physical environment

1.2.4.4.3 Wayfinding

How clarity of access will be provided for the entire campus or facility using a wayfinding system

*1.2.3.8.2.1 Design features. Design features shall address identified security risks specific to the patient demographics and environmental factors related to the project scope.

*1.2.3.8.2.2 Emergency management security considerations
**Commissioning**

- Development of Owner’s Project Req.
- Preparation of the Basis of Design (A&E)
  - Describe systems
  - Diversity & Safety Factors
  - Classes of components
  - Redundancy
  - Occupant density
  - Limitation and restriction of systems
- Preparation of Commission Plan (A&E)
- Commissioning Specifications
- Construction Checklists
- Performance of Functional/Operation
- Commissioning Report
- Commissioning Agent (Owner)

- Record Drawings and Manuals

---

**1.2-7 Commissioning**

Commissioning is a quality process used to achieve, validate, and document that facilities and component infrastructure systems are planned, constructed, installed, tested, and capable of being operated and maintained in conformity with the design intent to meet the owner’s project requirements (OPR).

### 1.2-7.1 Commissioning Requirements

On projects involving installation of new or modification to existing physical environment elements critical to patient care and safety or facility energy utilization, at minimum the following systems shall be commissioned:

- 1.2-7.1.1 HVAC
- 1.2-7.1.2 Automatic temperature control
- 1.2-7.1.3 Domestic hot water
- 1.2-7.1.4 Fire alarm and fire protection systems (integration with other systems)
- 1.2-7.1.5 Essential electrical power systems

### 1.2-7.2 Commissioning Activities

At minimum, the following commissioning activities shall be undertaken:

- 1.2-7.2.1 Development of the Owner’s Project Requirements (OPR)
  - The owner shall develop the OPR, which identifies building systems and elements that will be affected by the project scope and defines performance, operations, maintenance, longevity, energy efficiency, and other parameters required to meet the owner’s expectations.

- 1.2-7.2.2 Preparation of the Basis of Design (BOD)
  - In response to the OPR, the design team shall prepare a BOD narrative describing the design intent. At minimum, the BOD narrative shall include the following elements:
    - 1.2-7.2.2.1 Description of the systems, components, and methods used to meet the owner’s project requirements
    - 1.2-7.2.2.2 Diversity and safety factors used in sizing
    - 1.2-7.2.2.3 Classes of systems and components planned (e.g., duct class, clean room class, etc.)
    - 1.2-7.2.2.4 Levels of redundancy planned
    - 1.2-7.2.2.5 Occupant density anticipated
    - 1.2-7.2.2.6 Limitations and restrictions of systems and assemblies assumed
    - 1.2-7.2.2.7 Indoor and outdoor conditions assumed (e.g., space temperature, relative humidity, lighting power density, glazing fraction, U-value and shading coefficient, wall and ceiling R-
1.2.2.2 Purpose of the Project
Services to be provided, expanded, or eliminated by the proposed project shall be described.

1.2.2.2.3 Project Type and Size
1.2.2.2.3.1 The type of hospital(s) proposed for the project shall be identified as defined by the Guidelines.
1.2.2.2.3.2 Project size in square footage (new construction and/or renovation) and number of stories shall be provided.

1.2.2.4 Construction Type/Occupancy and Building Systems
1.2.2.4.1 New construction. If the proposed project is new construction that is not dependent on or attached to an existing structure, the following shall be included:
   (1) A description of construction type(s) for the proposed project
   (2) A description of proposed occupancy(ies) and, if applicable, existing occupancy(ies)

1.2.2.4.2 Renovation. For a project that is a renovation of, or addition to, an existing building, the following shall be included in the project narrative:
   (1) A description of the existing construction type and construction type for any proposed renovations or additions
   (2) A general description of existing engineering systems serving the area of the building affected by the proposed project

1.2.2.5 Project Components and Scope

APPENDIX
A1.2.2.6 Indirect support functions. These functions may or may not reside adjacent to or in the same building or building with the project.

A1.2.3 Project gross floor area
a. Gross floor area for the project should be aggregated by department, and multiplying factors should be applied to reflect circulation and wall thicknesses within the department or functional area. This result is referred to as department gross square footage (GSF).

Guidelines for Design and Construction of Hospitals
15

Introduction of the Space Program
• Shall be provided
• List organized by Dept./Functional Unit
• Size in gross and clear floor area
• Cite FGI Guidelines Paragraph
Fall Prevention Assessment

- Fall Prevention Elements of the SRA
  - Identify fall risk locations
  - Required for New Const./Renovation
- Design Features
  - SRA shall identify for at risk locations

1.2-4.4 Fall Prevention Assessment

1.2-4.4.1 Fall Prevention Elements of the Safety Risk Assessment

1.2-4.4.1.1 Fall-risk locations. The SRA report shall identify fall-risk locations for a new construction or renovation project.

1.2-4.4.1.2 Design features. The SRA team shall identify required patient fall prevention design features for the identified at-risk locations. See Section 2.1-7 (Common Elements for Hospitals—Design and Construction Requirements).

1.2-4.4.2 Fall Prevention Response

1.2-4.4.2.1 Design team shall incorporate required patient fall prevention design features in the project design documents.

1.2-4.4.2.2 For renovation projects, documentation shall describe the specific fall risk mitigation methods to be used in and around construction zones and shall, at minimum, address the following:

- Standards for barriers and other protective measures required to protect adjacent areas and susceptible patients from clutter and construction dust or debris.
- Description of construction zone mitigation measures.
- Barrier design and implementation.
- Dust mitigation on flooring.
- Clutter protection from debris.
- Ceiling-mounted VDT displays.
- Hearing protection.
- Location of patient toilet room and the headwall rather than across room.
- Location of toilet in the patient toilet room.
- Location and number of toilet grab bars.
- Location of barrier.
- Lighting in the patient toilet room.
- Location of vent.
- Location of water spigot.
- Location of toilet.
- Location of sink.
- Location of lavatory.
- Location of emergency call station.
- Location of water faucet.
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1.2 Planning, Design, Construction, and Commissioning

1.2-6.3.1 An organized approach to wayfinding about the entire campus or facility shall be provided.

1.2-6.3.2 Signage shall be consistent with all state, local, and federal regulations.

1.2-6.4 Design Considerations for Accommodation of Patients of Size

1.2-6.4.1 Projected Need for Accommodations for Care of Patients of Size

The need for accommodations for care of patients of size shall be defined in the planning phase and shall include the following:

- Signs should differentiate between those spaces used by patients/visitors and those used by staff.
- Interior wayfinding (signage/placement):
  - Signs providing directions should be placed at major decision points, including the following:
    - Major intersections
    - Major destinations
    - Changes in buildings
  - If there are no major decision points, assurance signs should be placed approximately every 200 feet (61 meters).
- Interior wayfinding (signage/maintenance): Fabrication should be in a manner that allows messages to be changed.

A1.2-6.3.1 An organized approach to wayfinding should include the following:
- An integrated system that coordinates elements such as visible and legible signs and numbers
- Verbal directions, paper information, and electronic information

A1.2-6.4 Design considerations for accommodation of patients of size

- The patient’s weight, the distribution of the patient’s weight throughout the body, and the patient’s height are involved in identifying a patient who requires additional assistance, expanded-capacity equipment, and larger space for patient care, nursing, handling, and mobilization. Such patients are not necessarily receiving intensive care, thus the term “patient of size” is often used. The most commonly accepted method for clinically identifying patients of size is the body mass index (BMI).
- Creating health care environments that can accommodate patients of size requires attention to issues that significantly affect design, such as the nature of the clinical unit or area, current codes, and local regulations. Refer to appendix sections A1.2-6.4.1.1 (Projecting the weight capacities of patients of size to be served), A1.2-6.4.1.2 (Projecting the number of spaces required to accommodate patients of size), and A1.2-6.4.1.3 (Projecting the number of expanded-capacity lifts required) to find suggestions for determining the number of rooms per specific unit that should be able to accommodate patients of size and the number of expanded-capacity lifts. Useful information is provided in the Joint Commission monograph “Improving Patient and Worker Safety: Opportunities for Synergy, Collaboration, and Innovation.”

Note: See the glossary for a definition of “patient of size.”

Accommodation of Patients of Size

- Define in Planning Phase & Include
  - Projected weight capacity
  - Projected number of spaces
  - Projected number of lifts

- Design Response
  - Projected maximum weight impact
  - Sinks, Toilets, Grab Bars
  - Casework
  - Lifts (mechanical)

- Facility Area Accommodation
  - Egress paths
  - Hand rails and devices
  - Clearances - doors & passages
1.2.6.4.2.1 The projected maximum weight of patients of size who will require accommodations shall determine the design requirements for sinks, toilets, grab bars, casework, and lifts in areas where patients of size will receive care.

1.2.6.4.2.2 These areas of the facility designated for accommodations for patients of size, and the associated path of egress to reach these areas, shall be designed with appropriate support and clearances.

Emergency Preparedness & Management

- Consider during planning and design
- Likelihood of extreme events
- Event beyond normal operations
- Space Needs during event
- Protect occupants
- Provide services

1.2.6.5 Emergency Preparedness and Management

During project planning and design, the following shall be considered:

1.2.6.5.1 The likelihood that a facility will experience events that go beyond a facility’s normal operations

c. Wind- and earthquake-resistant design for new buildings

- Facilities should be designed to meet the requirements of ASCE/SEI 7: Minimum Design Loads for Buildings and Other Structures or building codes with substantially equivalent requirements. Particular attention should be paid to seismic considerations in areas where the classification of a building would fall into seismic design categories C, D, E, or F as described in ASCE/SEI 7.

- Seismic construction inspection. The governing body should complete the testing described in Section 11A.2 and special inspection during construction of the seismic systems described in Section 11A.3.3 of ASCE/SEI 7.

- Roof considerations
  - Roof coverings and mechanical equipment should be securely fastened or tied down to the supporting roof construction and provide weather protection for the building at the roof. If ballast is used, it should be designed so as not to become a projectile.
  - In addition to the wind force design and construction requirements specified, particular attention should be given to the design of roofing, entries, glassing, and plumbing to minimize uplift, impact damage, and other damage that could seriously impair a building function.

6. Fire protection

- In accordance with Executive Order 13188 (Floodplain Management), possible flood effects should be considered when selecting and developing the site.
- As far as possible, new facilities should not be located on designated flood plains.
- Where locating a facility on a floodplain is unavoidable, consult the U.S. Army Corps of Engineers regional office for the latest applicable regulations pertaining to required flood insurance and protection measures.
- Hospital buildings should be located a minimum of 3 feet above the 100-year flood elevation on campuses constructed on designated floodplains. A path of travel above 100-year flood elevation should be provided between hospital acute-care facilities and the elevators to facilitate evacuation.
What are you thinking?

This is a lot of information!
How do we manage all of this?
On top of everything else we have to do, now this?
This is a monster!
There is no crystal ball!

FGI Guidelines describes a process and minimum requirements

Manage the process and the methodologies for solutions

NJDHSS Recognizes Part 1 - Adopted FGI in full

Remember that a vast amount of the guidance is to be provided by the “governing authority”

Part 1 is structured to support the Planning, Design and Construction process. To operationalize the Environment of Care, do no harm and improve outcomes.

It is the governing authorities responsibility to provide direction to the design team.
How?

- Create the MDT
- Assemble experts
- Leverage the teams knowledge
- Apply knowledge and perform assessments

<table>
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<tr>
<th>EXPERT</th>
<th>Infection control risk</th>
<th>Patient handling and movement</th>
<th>Fall prevention</th>
<th>Medication safety</th>
<th>Behavioral and mental health risk</th>
<th>Patient immobility</th>
<th>Security risk</th>
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</table>
Create the Functional Program

- Understand the purpose - communicate intent
- Responsibility of the governing body
- Completed during planning but continuously updated through construction
- Use correct nomenclature
- Project purpose, type, size
- Construction Type, Occupancy and Building Systems
- Address support functions
- Address operational requirements
- Publish, maintain and communicate to team

Create the Space Program

- Organize by Department, Function, Size, Floor Area and reference FGI Guidelines Parts and Sections
1.2 PLANNING, DESIGN, CONSTRUCTION, AND COMMISSIONING

<table>
<thead>
<tr>
<th>Table 1.2-1</th>
<th>Safety Risk Assessment (SRA) Components</th>
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<td><strong>Assessment</strong></td>
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<td>Patient handling and movement (PHAMA)</td>
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<td>Fall prevention</td>
<td>Any area to which a patient or family member has access</td>
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<td>Medication safety</td>
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<td>Behavioral and mental health risk</td>
<td>Any area where behavioral health patient care is provided</td>
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<td>Patient immobility</td>
<td>Inpatient locations</td>
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<td>Security risk</td>
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</tbody>
</table>
Address and Document EOC Requirements
(Governing authority, Design Team)

- Evaluate and document components and key elements of the EOC
  - Delivery and Care Model Concepts
  - Patients, Visitors, Physicians and Staff Accommodation and Flow
  - Building Infrastructure and Systems Design
  - Physical Environment Elements
  - User Control of Environment
  - Safety and Security
  - Architectural Details, Surfaces and Finishes, Furnishings
  - Cultural Responsiveness
Address Planning and Design Consideration Requirements
(Design Team)

- Acoustic Design
  - Exterior site noise, noise sources and exterior noise classifications
  - Design Criteria for Acoustic Surfaces
  - Design Criteria for Room Noise Levels
  - Design Criteria for Interior Wall, Floor and Ceiling Surfaces
  - Design Guidelines for Speech Privacy
  - Design Criteria for Building Vibration

- Sustainable Design
  - Site Selection, Waste, Water Conservation, Energy, Air Quality
  - Building Materials

- Wayfinding

- Patients of Size

- Emergency Preparedness Management
Renovation
(Design Team, Governing Authority)

- Phasing
  - Phasing and Phasing Provisions
  - Noise and Vibrations
  - Isolation
  - Maintenance of Air Quality and Utilities
  - Documentation of Existing Conditions
Commissioning
(Governing Authority, Design Team)

- Commissioning Requirements and Activities
- Development of the Owners Project Requirements
  - Identify building systems and elements
  - Define parameters, Performance, Operations, Maintenance, Longevity and Energy Efficiency
  - Preparation of the Basis of Design (BOD)
    - Systems, Components, Diversity, Classes, Redundancy, Limitations and Restrictions, Indoor and Outdoor conditions.
- Preparation of Commissioning Plan, Specifications and Checklists
- Performance of Functional/Operational Tests
- Commissioning Report, assign Commissioning Agent
Record Drawings and Manuals
(Governing Authority, Const. Manager, A&E Team)

- Record Drawings
- Life Safety Overlay
- Equipment Manuals
- Design Data
Conclusion

Part 1 of the FGI Guidelines asks the governing authority (Hospital) to take the lead in the PDC process. Though (historically) healthcare providers have leaned on the Architect to provide guidance, in reality, it is the governing authorities responsibility to establish, assess and publish this information to the Design Team.

The process is expected to be continuous in nature from project initiation, through design, construction, commissioning and occupancy.

Documentation shall be maintained throughout the process, information shall be distributed, retained and managed for future reference.
Questions?
Who are HealthRisk Technologies?

HealthRisk Technologies is dedicated to providing a new generation of surveying, assessing and reporting.

- HealthRiskTechnologies.com
- HRT Mobile
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- michaelangelo@healthrisktechnologies.com