Volume 2

Queensland Health

Capital Infrastructure Requirements

Volume 2 Functional Design Brief

Section 2.1 Principles

Queensland Government

Capital Infrastructure Requirements Volume 2 Functional design brief – Section 1: Principles

Published by the State of Queensland (Queensland Health), August 2020

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An electronic version of this document is available at https://www.health.qld.gov.au/system-governance/policies-standards/doh-policy

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Version	Author	Version Description	Released Date	Approved for Release by
1.0	Health Planning and Infrastructure Division, Queensland Health	First public release	28 May 2012	DDG, Health Planning & Infrastructure Division
1.1	Health Infrastructure Branch	Name changed from Capital Infrastructure Minimum Requirements to CIR Approved	5 April 2013	DDG, System Support Services
2.0	Health Infrastructure Branch	Second public release. Updated information regarding Legionella, infection control and other minor edits.	3 September 2014	DDG, Office of the Director-General
3.0	Capital and Asset Services Branch	Updated to align with the new water risk management provisions under the Public Health Act 2005 (February 2017)	7 August 2017	DDG, Corporate Services Division
4.0	Capital and Asset Services Branch	Incorporation of BIM, updated references, refreshed layout, compliance statement and checklist process reviewed.	22 October 2020	DDG, Corporate Services Division

Contents

1 Introduction

The purpose of the Capital Infrastructure Requirements (CIR) *Volume 2 Functional design brief Section 1 Principles*, is to provide the overall context and principles, at both the Queensland State Government and Queensland Health levels in which health infrastructure planning takes place. It covers specific areas of the functional design brief for which Queensland Health has a preferred or standardised approach.

The facility planning process and functional design brief must reflect and respond to the latest Queensland Health and State Government strategic policy and direction. This includes, but is not limited to, linking the functional design brief to the:

- directions of the *My health, Queensland's future: Advancing health 2026*
- vision, purpose and values outlined in the current Queensland Health Strategic Plan
- direction and strategies of the Hospital and Health Service (HHS) strategic plan.

2 Governance

Governance of the functional design brief process is guided by the agreed project management governance structure and processes in place at the time work is undertaken.

All projects require a governance structure so that accountabilities, roles, responsibilities and decision-making and reporting relationships are clear. All facility planning projects must have a well-defined and documented governance structure that includes:

- an executive committee
- a senior responsible owner/business change owner
- project director
- a project board (steering committee)
- stakeholder working groups
- project teams.

The roles and responsibilities for each of these entities must be clearly articulated in the project plan and signed off or approved by the highest authority in the governance structure.

3 Statewide approaches

All projects must comply with the latest statewide approaches. These will develop and change over time. Consideration of approaches, policies and standards beyond any particular HHS would include the following:

- bedroom configuration and percentage of single rooms
- building information systems

- food service solutions and procurement arrangements
- infection control
- information, communication and technology services
- linen service solutions and linen procurement arrangements
- occupational health and safety
- patient safety and quality
- staff amenities
- telehealth
- water quality in health care facilities
- workstations and office accommodation
- building information modelling (BIM) processes.

The Australian Standards, *National Construction Code* (NCC) and local government regulations provide the basis for planning. Queensland Health also uses specific approaches, internal agencies and their guidelines for a number of departments/unit or services that may be included in the facility design process.

3.1 Adherence to policy

There are several Queensland Health policies that impact on design and therefore need to be considered and referenced during a design project. Policy will change over time and current Queensland Health policies are available at:

https://www.health.qld.gov.au/system-governance/policies-standards/doh-policy

3.2 Use of expert Queensland Health groups

There are a number of expert Queensland Health groups than can be used as a resource to provide advice, direction and information about legislative and other requirements for design. These groups have been summarised in Table 1.

Table 1: Expert Queensland Health resource groups

Group	Resource Area
Aboriginal and Torres Strait Islander Health Division	
Clinical Excellence Queensland	• Allied Health Professions' Office of Queensland • Centre for Leadership Excellence • Healthcare Improvement Unit • Mental Health, Alcohol and Other Drugs Branch • Office of the Chief Dental Officer • Office of the Chief Nursing and Midwifery • Patient Safety and Quality Improvement Service
Corporate Services Division	• Capital and Asset Services Branch
eHealth	• Infrastructure Technology Solutions • Cyber Security • Digital Architecture (Enterprise Architecture) • Digital Infrastructure Services (Carriage
Health Support Queensland	• Biomedical Technology Services • Central Pharmacy • Clinical Information Systems Support • Forensic and Scientific Services • Group Linen Services • Pathology Queensland • Radiology Informatics Support
Prevention Division	• Aeromedical Retrieval & Disaster Management Branch • Chief Medical Officer and Healthcare Regulation Branch • Communicable Diseases Branch • Health Protection Branch • Office of the Chief Health Officer • Preventive Health Branch

National expert groups also need to be considered as an information and advisory resource during design, such as the National Health and Medical Research Council.

4 Role delineation

In Queensland, the *Clinical Services Capability Framework* (CSCF) is used to categorise clinical service levels. Other states in Australia and the Australasian Health Facility Guidelines (AusHFG) use role delineation to describe a level of service complexity of the clinical activities undertaken by that service. Each level of service has associated minimum standards, support services and staffing profiles considered appropriate for service delivery.

The CSCF has been designed to guide a coordinated and integrated approach to health service planning and delivery in Queensland. It applies to both public and licensed private health facilities and enhances the provision of safe, quality services by providing service planners and service providers with a standard set of minimum capability criteria.

The CSCF's purpose is to:

- describe a set of capability criteria that identifies minimum requirements by service level
- provide a consistent language for healthcare providers and planners to use when describing and planning health services
- assist health services to identify and manage risk
- guide health service planning
- provide a component of the clinical governance systems, credentialing and scope of practice of health services
- instil confidence in clinicians and consumers that services meet minimum requirements for patient safety and guide health service planning[1].

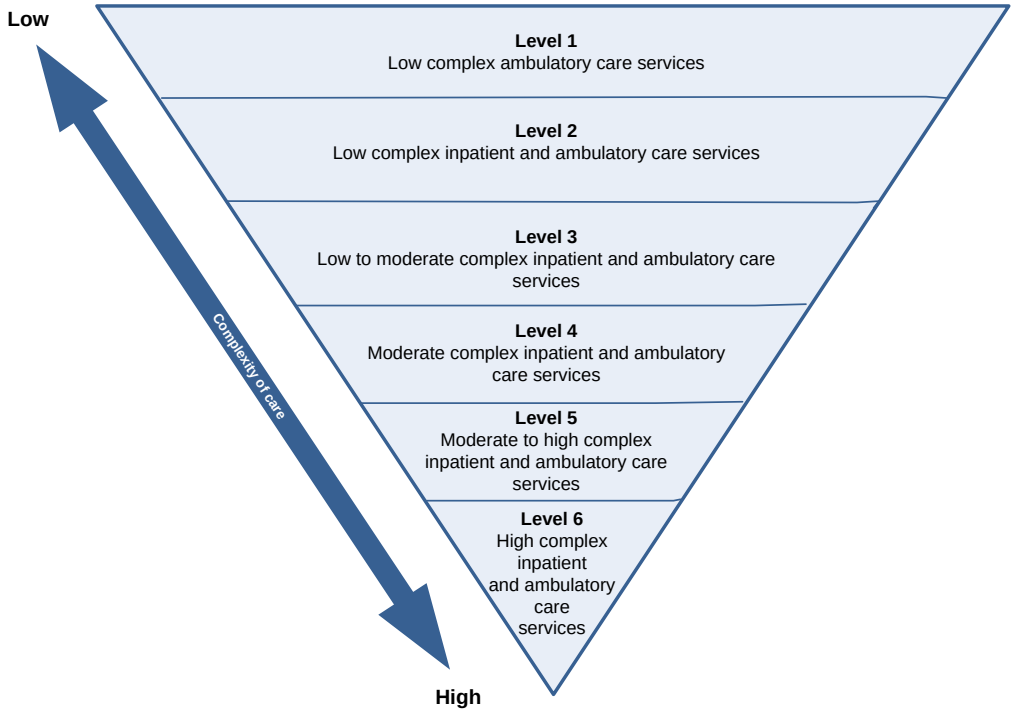
Within the CSCF, clinical services are categorised into six levels with a level 1 service managing the least complex patients and a level 6 service managing the highest level of patient complexity. However, complexity of care may vary between service modules. The size of the service and diversity of healthcare managed at each level will be greater as service levels increase. The clinical service levels by complexity of care are summarised in Figure 1.

The assumption for the functional design brief is that the CSCF level for each service has been included in the health service plan. In completing the functional design brief, each service's CSCF service level is confirmed, updated and documented for design completion.

The CSCF documents are available at: https://www.health.qld.gov.au/clinical-practice/guidelines-procedures/service-delivery/cscf

[1] Queensland Health, Clinical Services Capability Framework

Figure 1 Clinical service levels by complexity of care



Source: Queensland Health, Clinical Services Capability Framework

5 General design considerations—built form

Just as health planners require specific information to develop health service plans, architects, engineers and health facility planners rely on the functional design brief as a key source of information impacting on the built form. In addition to the functional requirements of clinical and non-clinical service delivery, there are a number of geographical, local planning and other elements which influence design. This information is important in the initial stages of design as it dictates the approach and thinking of architects and engineers.

The functional design brief should aim to provide key information on the following:

- specific factors relating to climate and geography that need early consideration in design
- the urban or local planning context for the facility, in particular limitations and constraints
- the size of the facility
- any particular requirements to address evidence-based design
- specific design requirements for patient focus within the facility.

Overall, the adoption of evidence-based design principles will be considered in light of the size and nature of the project, the available budget and operational impacts.

5.1 Climate

Queensland has diverse climatic conditions and a number of climate zones. The effects of the climate on the project will be specific to where the project is located, and potentially very different to a similar project in another area of Queensland. The effect of climatic factors shall include consideration of water supply quality.

The CIR categorise Queensland climate zones according to the NCC Climate Zone Maps[2].

5.1.1 Temperature and solar access

The building design must suit local climatic conditions by responding directly to the impact of the temperature and solar access. The optimum levels of solar access by patients, staff and visitors during the summer and winter months should be considered. During the warmer summer months there may be a requirement to minimise the impacts of direct sunlight, while in the cooler winter months more sun exposure may be desirable both within and around the facility.

5.1.2 Humidity

Humidity in most zones can lead to condensation and mould problems. Non-air-conditioned and external spaces need to utilise materials able to withstand the long-term effects of exposure to humidity. High levels of humidity can bring discomfort to patients and staff. External or non-air-conditioned areas for patients, staff and visitors need to consider alternative solutions during periods of high humidity. Careful consideration of the insulation requirements in air conditioned and non-air-conditioned spaces is required.

5.1.3 Rainfall

The amount of rainfall and overland flood conditions should be established to determine impacts on the site. This must guide the overall master plan to allow patients, visitors and staff access to the facility without hindrance. The provision of covered walkways, awnings and waiting areas is highly desirable, especially in zones with high rainfall.

5.1.4 Prevailing winds

The direction and intensity of prevailing breezes should be considered during the master planning of the site. The siting of the building/s and the positioning of courtyards and negative space created should assist in providing accessible areas that open up to the

[2] https://www.abcb.gov.au/Resources/Tools-Calculators/Climate-Zone-Map-Australia-Wide

prevailing winds. This allows the healing environment to extend beyond the interior of the facility. Consider all implications for the design of structures located in a cyclonic zone.

5.1.5 Orientation

It is important to consider the orientation of the building/s in relation to the sun, wind and views. Siting and organisation of the building should respond to and prioritise unique natural views and other natural site features. This achieves both evidence-based design and environmentally sustainable design benefits.

Making maximum use of controlled sunlight achieves environmentally sustainable design benefits and enhances staff and patient comfort through natural light penetration.

Views from the health facility should be maximised, taking in a variety of character and landscape areas for the provision of visual access to the outdoors.

5.2 Planning integration

When establishing a functional design brief for the project, the planning and functional brief needs to reflect and respect items, such as:

- site context
- morphology and elevation
- transport corridors
- parkland and landscape
- density
- historic, cultural overlays
- open space and green space
- water supply quality
- expansion and future proofing requirements.

5.3 Evidence based design

In general, the application of principles around evidence-based design needs to be outcome or intent driven depending on the type of patient room being designed. For example, bed spaces that usually have a very short length of stay have different requirements to bed spaces for long stay patients.

Buildings and building details can have a huge effect on people who function and perform tasks within them. The design must start with patients, their needs for services and service delivery. A poorly designed building can hinder patient recovery and have a negative impact on staff recruitment and retention.

Evidence-based design addresses building design and design features with the objectives of improving health outcomes. Established links between the environment and reduction in stress, sickness, fatigue, medication, length of stay, incidence of accidents and re-admissions. Data has verified that factors such as natural light, orientation, view, air quality,

privacy, acoustics, colour, signage, appropriately designed corridors and artwork have a measurable effect on healing and the well-being of patients and staff alike.

5.4 Patient-focused design

Patient focused design can be guided by patient centred care objectives, such as:

- provide a healing environment
- provide for the requirements for the patient journey
- provide spaces that reflect diverse cultural, linguistic, and spiritual needs of patients, carers, and families, including a specific focus on the needs of Aboriginal and Torres Strait Islander people
- provide a safe environment, including safe water quality
- provide for the needs of specific groups within the community, including the frail elderly and people with disability.

Examples of design features that facilitate patient-centred care include:

- patient accommodation configured in functional self-contained pods of single patient bedrooms for high acuity and acute recovery overnight beds
- modular pods identical in design and layout, that house all the functions and general equipment to support the delivery of care to patients whilst minimising the need for staff to leave the pods in the provision of their primary tasks
- where practical, overnight stay patients have access to views and natural light as well as access to outdoor areas within reasonable proximity to their bedroom
- patient accommodation, including the provision of single bedrooms rather than traditional approaches
- transfer and movement of patients between departments is not through clinical areas
- inclusion of high observation requirements for high acuity patients
- determine which adjacencies are critical to clinical care delivery and reduce patient movement between units, for example emergency and medical imaging departments
- art and design can be used to recognise the diversity of patient communities and cultures and to reinforce the connection to the surrounding natural environment.

6 Technology and innovation

6.1 Future technology and equipment

The model of care for new and redeveloped facilities will rely on maximising the use of technology and new equipment as it becomes available and affordable. This includes use of technology in the management of information and communications.

Examples of considerations for design include:

- a basic premise that information and communications technology will support patient care services, through the provision of facility wide access to a wireless network
- clinical equipment has network capability that must be able to be used
- both clinical and non-clinical information collection and access must be enabled through use of integrated electronic mobile devices
- for major equipment items, the means to replace installed equipment with minimal disruption to service delivery and at minimal future building cost
- take into consideration potential downsizing of advanced equipment and the increase in number of items of equipment
- provide for future proofing of electrical power supply types
- ensure safe water supply to occupants
- the use of BIM to enable better asset information management.

6.2 Aspirations and potential inclusions

At the time of documenting the functional design brief, there may be items that are on the horizon which will support the model of care or model of service delivery. These items would ideally be included within the scope of the project. Some items may have space, architectural and engineering implications and should where possible be included in the scope to enable their future inclusion. While the project scope may not initially include a budget for these items, their potential impact is significant enough that it requires mention and planning consideration.

Current examples of future items that may require provision or changes to space and/or floor loading requirements and specialised engineering services are digital operating rooms, positron emission tomography scanner and next generation magnetic resonance imaging and linear accelerators.

7 Future proofing

It is accepted that change is inevitable and that it is difficult to predict with any degree of certainty how future requirements will impact on the delivery of health services and the configuration of facilities. The approach to facilitating sustainability of infrastructure facilities and their site needs to encompass the following:

- building flexibility and adaptability at the core of the planning and design process
- design must be initially efficient and must also facilitate change over time with minimal disruption to the delivery of ongoing services
- design must reflect a ‘whole-of-life’ costing approach that considers long-term viability of the facility and value for money.

7.1 Expansion space

Where the health service planning indicates growth in future health service delivery, the site must have the capacity to respond through expansion of an existing building or the construction of a new building.

Considerations for a site expansion would be:

- equivalent to a minimum of 25 per cent of the overall current site capacity
- adjacent to the existing facility
- on one side of the facility and not on multiple sides
- maintains functional relationships
- of a shape that enables construction of a standalone building
- provision for associated expansion of engineering and other infrastructure services capacity.

Expansion of specific services

At whole-of-facility site level, without compromising the requirements of this functional design brief, master planning must identify sufficient space to allow for the expansion of departments/units as identified in the health service plan. Typical examples of these would be expansion of the perioperative unit and increases to inpatient bed numbers with consideration of threshold capacity of all service dependencies.

In planning for expansion, new spaces must be:

- capable of incorporating all design outcomes being applied to the current project
- adjacent to their planned locations
- designed as a continuous flow of functionality and extend the gross floor area of the operating unit and inpatient area
- capable of being built without disruption to the delivery of services
- able to leverage off the planned utilities and engineering services.

Expansion of individual units

In planning for future expansion of individual units, provision must be made for services to potentially expand into the adjacent area. This provision must include:

- ability to redevelop the adjacent space with minimal disruption to service delivery
- ability to renovate at minimal cost
- future proofing of infrastructure services capacity for example; information and communication technology, power and air conditioning/handling
- provision for flexible use of space while maintaining maximum operational efficiency.

7.2 Standardisation and flexibility

Infrastructure facilities must seek to be modular in design and comprise modules of spaces that:

- are standardised in their design
- facilitate flexibility in the use of spaces throughout the facility
- allow for the potential use of a space (or cluster of spaces) for more than one discrete purpose or function over time
- allow for change in the use or purpose of a space (or cluster of spaces) in the facility at any time
- facilitate operational efficiencies in clinical and non-clinical support functions according to their models of care and service delivery
- allow for potential future expansion of the facility.

8 Staging and decanting

Staging is defined as the steps that are taken to build a facility or part thereof. Staging is determined after the completion of design through a 'build ability' analysis and operational review. Decanting refers to the practice of moving a service or group of services from one site to another.

The overarching principle is that construction and commissioning planning must minimise disruption to service delivery. It is accepted that clinical, clinical support and non-clinical services may need to be physically reoriented and/or moved during the construction phase.

Staging and decanting plans must be developed with the primary objectives of minimising disruption to service delivery and maintaining safety at required levels for patients, staff and visitors at all times.

Due to the technical nature of the equipment and reliance on advanced technology or supporting services, the following services are examples of services that should only be moved once from their current location to their final new destination:

- general X-ray
- magnetic resonance imaging
- CT scan
- renal chairs
- critical care units
- operating theatre suite.

9 Facility design criteria

Facility design criteria address key project objectives which might include standards for areas, such as access, information, communication and technology requirements and amenity. Key project objectives influence facility design and the types of items include:

- Patient-focused design
  - privacy
  - dignity
  - patient comfort
  - indoor environment quality
  - patient safety
- evidence based design
  - visual access to outdoor areas
  - physical access to outdoor areas
  - acoustic impact on healing
  - infection control
- increase operational efficiency
  - minimising recurrent costs
  - material selection
  - maintenance
  - operational zoning
  - departmental planning
  - minimal travel distances
  - patient flows
  - staff requirements, such as communication, safety, functionality of treatment areas
- future proofing—that is, the application of 'flexible fit' policy, access to equipment, maintenance, replacement and renewal, position of services, scalability
- access to services
- supports current and future models of care
- ability to flex service up and down depending on demand and staffing capacity
- innovative approaches
- adaptability and flexibility
- staff recruitment and retention-based design
- whole-of-life costs
- digital facility and information and communication provisions
- water quality and safety.

10 Standard components

Queensland Health requires the AusHFG to be used as a starting point for facility planning and design. The AusHFG are available from the below link:
http://healthfacilityguidelines.com.au/default.aspx

AusHFG does not negate the requirements of other building and design standards and codes. All projects are required to provide a statement of conformance with AusHFG specifications.

10.1 Standard rooms

The AusHFG detail a range of standard rooms that have the same or similar purpose across many functional planning units.

Only key planning considerations are addressed here for each room type, as full details are available on the AusHFG website: https://www.healthfacilityguidelines.com.au/standard-components

10.2 Proposed variations to standard rooms

Proposed variations or additions to either individual room names and/or floor areas, whether increases or decreases must be documented in the functional design brief. An example of the layout of a variation table follows in Table 2.

Table 2: Proposed variation to standard room names and/or sizes

Room name	Area m2 minimum	Room data sheet code	Proposed area m2	Reason
1 bedroom (inboard or outboard suite)	16	1BR–ST-A1	18	Children's bedrooms, to accommodate parents
Community room	N/A	N/A	45	New room for public activities and meetings.