Health New Zealand
Te Whatu Ora

Reference Inpatient Unit

Design Guidance Note

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Health New Zealand
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Executive summary

Health Infrastructure Plan 2025 | Building Hospitals Better

Our hospital buildings and campuses are crucial in enabling clinical staff to deliver high quality care safely and effectively to New Zealanders. The public health system faces a number of challenges in meeting the health needs of New Zealanders, including a growing, ageing and more diverse population which is placing increasing demand on health services and its supporting infrastructure. Our geography and history have resulted in different standards of health facility and provision across the country. There are also persistent differences in health outcomes for New Zealanders based on who they are, their health needs, and where they live. In March 2024, the Government announced health targets for: faster access to cancer treatment, increased childhood immunisation rates, shorter stays in emergency departments, and shorter wait times for first specialist assessments and elective treatment. The five health targets focus the health system on areas that really matter to New Zealanders and help improve the performance of our health services across the country. To achieve these targets and improve the performance of the health system will require enhancements, including a national approach to investment in our health infrastructure.

How we deliver care with existing infrastructure presents challenges. The health estate is widely dispersed and aged, with emerging challenges limiting our options for re-investment. We must shift to a new way of doing things. The Health Infrastructure Plan requires moving towards a new approach to building hospitals in New Zealand - Building Hospitals Better.

This national approach to hospital development is occurring through:

- Improved early planning through clinical network plans and site master plans for all hospital campuses.
- National modelling of population demand to ensure a consistent approach to determining and managing the scale of builds.
- Greater control over hospital design through set functional requirements, standardised design, and nationally managed design for major hospital builds.
- Collaboration with the market to better match builds to market capacity and active responsibility and ownership of the supply chain.

Standardised Approaches

Developed on the Australasian Health Facility Guidelines Inpatient Unit Health Planning Unit, with New Zealand specific briefing, consultation and engagement; the Reference Inpatient Unit is the first in a series of national endorsed reference designs offering a baseline configuration for 32 Bed Adult Acute Inpatient Units across New Zealand.

As a reference design, this document outlines not just the Health Planning Principles, but has also taken into consideration key building design principles including, Structural Engineering, Building Services Engineering and Fire Engineering. As a framework, the associated principles and concept layout that has been developed to respond to the Schedule of Accommodation can be utilised to fast-track the design and development of inpatient towers in future Health New Zealand capital projects.

Related reports

Refer to the following supporting reports in the creation and outcomes of the Reference Inpatient Unit:

Bed Typology – Appendix A

Related Standards and Guidelines

Standards and Codes

- New Zealand Building Code
- New Zealand Standards

Australasian Health Facility Guidelines

Including:

- Part A: Introduction
- Part B: Health Facility Briefing and Planning
    - HPU 0340 – Adult Acute Inpatient Unit
- Part C: Design for Access, Mobility, Safety and Security
- Part D: Infection Prevention and Control
- Part E: Building services and Environmental Design
- Part F: Project Implementation

Refer to: https://healthfacilityguidelines.com.au

Health New Zealand Design Guidance Notes

Including:

- New Zealand Health Facility Design Guidance Note
- Technical Guidelines for the Seismic and Structural Design of Hospital Buildings
- Design Guidance Note - Fire Engineering Design for New Zealand Public Hospitals
- HISO-10105-2025 - National Digital Communication Systems and Structured Cabling Standard

Refer to: Publications – Health New Zealand | Te Whatu Ora.

Other Guidance Documents

This document has also been informed by other industry guidance and best practice but tempered with New Zealand centric ‘lens’ applied.

Including:

- UK National Health Service (NHS) Health Technical Memoranda (HTM)
- ANSI/ASHRAE/ASHE Standard 170-2021 - Ventilation of Health Care Facilities

Introduction

Introduction

Purpose

This report summarises the principles and design outcomes from the development of reference 32-Bed Adult Inpatient Unit. The intent of this reference design is that it can be used (and adapted as appropriate) as a reference baseline configuration for regional projects across New Zealand.

It is based on the Adult Acute Inpatient Unit Functional Design Brief developed across the Regional Hospital Redevelopment Programme (RHRP) and its corresponding Schedule of Accommodation, which is based on the use of standard component extracted from the Australasian Health Facilities Guidelines (AusHFG) with New Zealand specific overlays.

Methodology

The development of this document involved three key phases:

- Collation and analysis phase:
  - Gather and study benchmark examples.
  - Development of functional design briefs across multiple sites.
- Workshop Phase:
  - Architects, Clinical Health Planner, Engineers and HNZ representatives.
  - Confirm AusHFG components.
  - Develop a robust set of planning principles.
  - Agree on items that could be shared between IPU's.
- Reporting Phase:
  - Distribute draft report for comments.
  - Engagement with stakeholders including Infrastructure and Investment Group (IIG) and user groups across the Regional Hospital Redevelopment Programme.
  - Feedback incorporated.

Policy Context

The Australasian Health Facility Guidelines (AusHFG) provide information to assist health services and design teams to plan and design health facilities. The guidance developed as part of the Reference IPU is an extension of the AusHFG's and has been developed in line with the AusHFG principles, in particular:

- Part B - Health Facility Briefing and Planning
- Part C - Design for Access, Mobility, OHS and Security
- Part D - Infection Control and Prevention
- Part E - Building Services and Environmental Design

In addition to the AusHFG Health Planning Unit (HPU) for an Adult Acute Inpatient Unit, Health New Zealand undertook wide user group engagement to further develop a New Zealand specific Inpatient Unit Bed mix typology.

This includes:

- 50% Single Rooms – 16 x single rooms, inclusive of:
  - 1 x Class N (Negative pressure) bed
  - 2 x Standard bariatric beds
- 50% 2-Bed Rooms = 16 x beds
  - Side-by-side configuration
- Patient lifters – Hoists (2 x bariatric + 2 x single) giving a 1:8 ratio.
- Beds podded into 8 beds
- Inboard ensuites

How to use this guide

This report has been split into 4 sections; Building Shell/Core, Architecture & Health planning, Fire Engineering, and Services Engineering, and flows in order of influence to a final building outcome.

This document is intended as baseline guidance, to be applied in the first instance during early concept design for the purpose of project planning. It is acknowledged that, as individual projects evolve, variances and deviations from this document may be required to meet the individual project objectives. For more information on how Deviations from Project Briefing and Reference materials are to be tracked.

Refer to the Health New Zealand – Te Whatu Ora Design Assurance Framework.

https://www.tewhatuora.govt.nz/publications/design-guidance-and-assurance-framework

For any questions about this document, or other project briefing, please email:

facility.design@health.govt.nz

Building Shell & Core

Structural Grids

Background

The structural grid is a key design component in the hospital “chassis” as it sets the spatial modules for repeated spaces inside the building.

General Principles

Key items to assess the optimum solution, and the reference IPU's chosen direction are:

- 1 bed configuration – 4.2m wide room selected
- 2 Bed configuration – side-by-side configuration selected
- Ensuite configuration – inboard arrangement generally selected, (nested arrangement for Bariatric/Negative Pressure rooms selected)
- Handed vs. Mirrored – Mirrored room strategy selected

To maximise usable clinical spaces and reduce the instances where columns appear in the centre of the room, key functional spaces in the building are align with the structural grid.

Grid modules typically used:

- 8.4m width along the façade length
  - Generally, aligns with AusHFG Standard 1 Bedroom and 2 Bedroom components.
- 8.4m perpendicular to the façade
  - Aligns with 1 bedroom standard components depth + corridor width,
  - Aligns with 2 bedroom standard component depth

Recommendation

An 8.4 x 8.4m structural grid layout has been used to develop the reference ward. It provides the most alignment with Inpatient Unit AusHFG Standard Components as well as other HPU Standard Components that may sit adjacent/beneath.

Floor to Floor Heights

Background

A buildings floor-to-floor height is another key design component informing the building "chassis."

General Principles

This parameter is usually informed by 5 parameters.

1. What is the minimum ceiling height for the functional rooms in this department (typically 2700mm in IPU areas or 3000mm in parts of the acute blocks/ICU)?
2. What is the structural system, and its depth from the top to underside of structure/beams (will depend on the systems used and the design depth)
3. What is the minimum in-ceiling space for the relevant building services?
4. Are there any site specific existing floor levels we need to marry into – to avoid ramps for patient care areas.
5. Are there any design/manufacturing levels to marry into (e.g. 300mmx300mm planning grid)

While the AusHFG is not prescriptive in these dimensions, there are some benchmark dimensions frequently used within the industry.

Inpatient Units – typically 4200mm floor to floor, assuming a 2700mm minimum ceiling level, and a low-profile concrete structure.

- Acute Areas – typically 4500mm floor to floor, assuming a 3000mm minimum ceiling area (e.g. for Operating theatres, Imaging rooms, ICU, Pharmacy, Pathology labs) and a low profile concrete structure.
- Inpatient Towers will rarely exist without connectivity to Acute Services. For overall flexibility, a 4500mm floor to floor height is often adopted on a greenfield site so that floor levels align across all buildings on a site (without the need for ramps).

The exceptions are often the back of house/loading bay areas and ambulance bays which require a higher floor to floor, and the upper story of inpatient tower without horizontal connections to other buildings, which can reduce floor-to-floor height, and buildings on brownfield sites which require connections back into existing floor plates that might depart from the typical 4200mm or 4500mm height.

Recommendation

A 4.5 meter floor-to-floor has been utilised to develop the reference ward. It provides the most alignment for horizontal connectivity across other building typologies on campus.

Structural Systems

Background

The structural system of the building (slab system, framing system, and seismic restraint system) can have significant implications to a buildings construction costs, adaptability and flexibility over its life cycle, and have further downstream implications to building services. The following principles have been utilised in the development of the reference design.

General Principles

The structural design of an Inpatient Ward building should, in the first instance, have sufficient 'open space' to allow for efficient packaging of the required clinical spaces and, as a result, allow for maximum future flexibility of the building.

The ‘ideal’ system used in an Inpatient Ward building includes:

- Open spaces
- Enables simplified services reticulation
- Light-weight superstructure
- Shallow foundations
- One-way lateral systems
- Adaptability to be implemented across the country through various seismic zones with minimal ‘regionalisation’

Recommended Systems for Additional Investigation

By applying innovative structural solutions, the above 'ideal system' can be realised. 3 systems have been highlighted for further investigation, including:

Option 1 - Structural steel frames with metal deck (Comflor or Traydec) flooring system considering either a combination of moment frames and EBFs or EBFs in both directions

Option 2 - Structural steel frames with a CLT flooring system considering either a combination of moment frames and EBFs or EBFs in both directions

Option 3 - Structural steel frames (one-way moment resisting frames in both directions) with a CLT flooring system

Translating Functional Briefing into Building Massing.

Background

Using the recommended 8.4 metre x 8.4 metre grid modules, the associated schedule of accommodation has been translated into a 7x3 grid module building mass.

General Principles

Of the 7 longitudinal grid modules, 6 modules are utilised for functional areas dedicated to the ward itself. The remaining 1 module is utilised for shared Front of House, Back of House and Travel functions, with acknowledgment that these areas to be shared either between additional Inpatient Ward buildings, and/or between an Acute Service Building, both options connected to the original Inpatient Ward building through a hospital street.

Figure 1: Reference IPU Ward Building

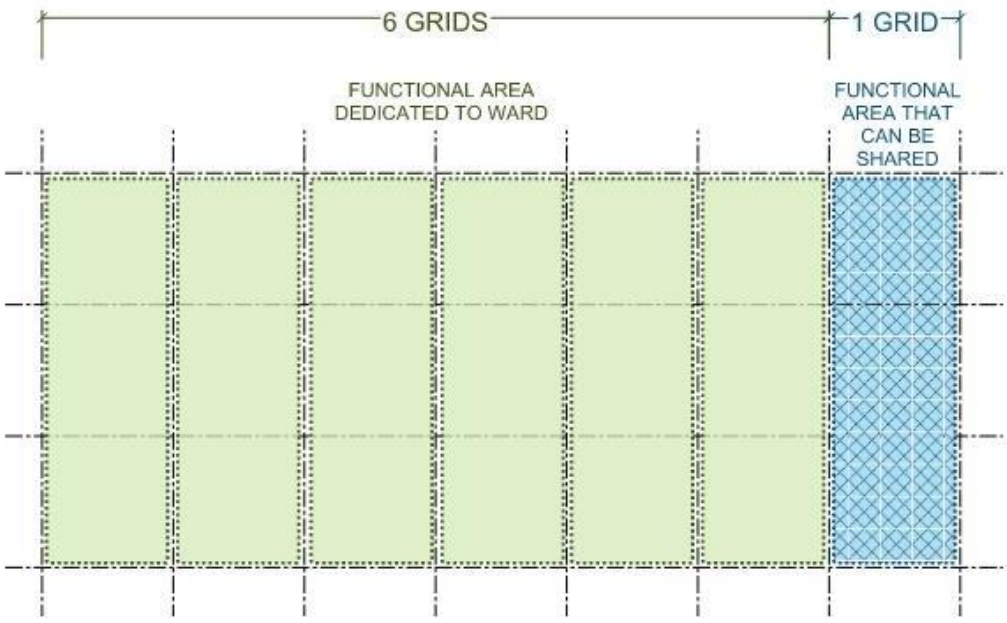
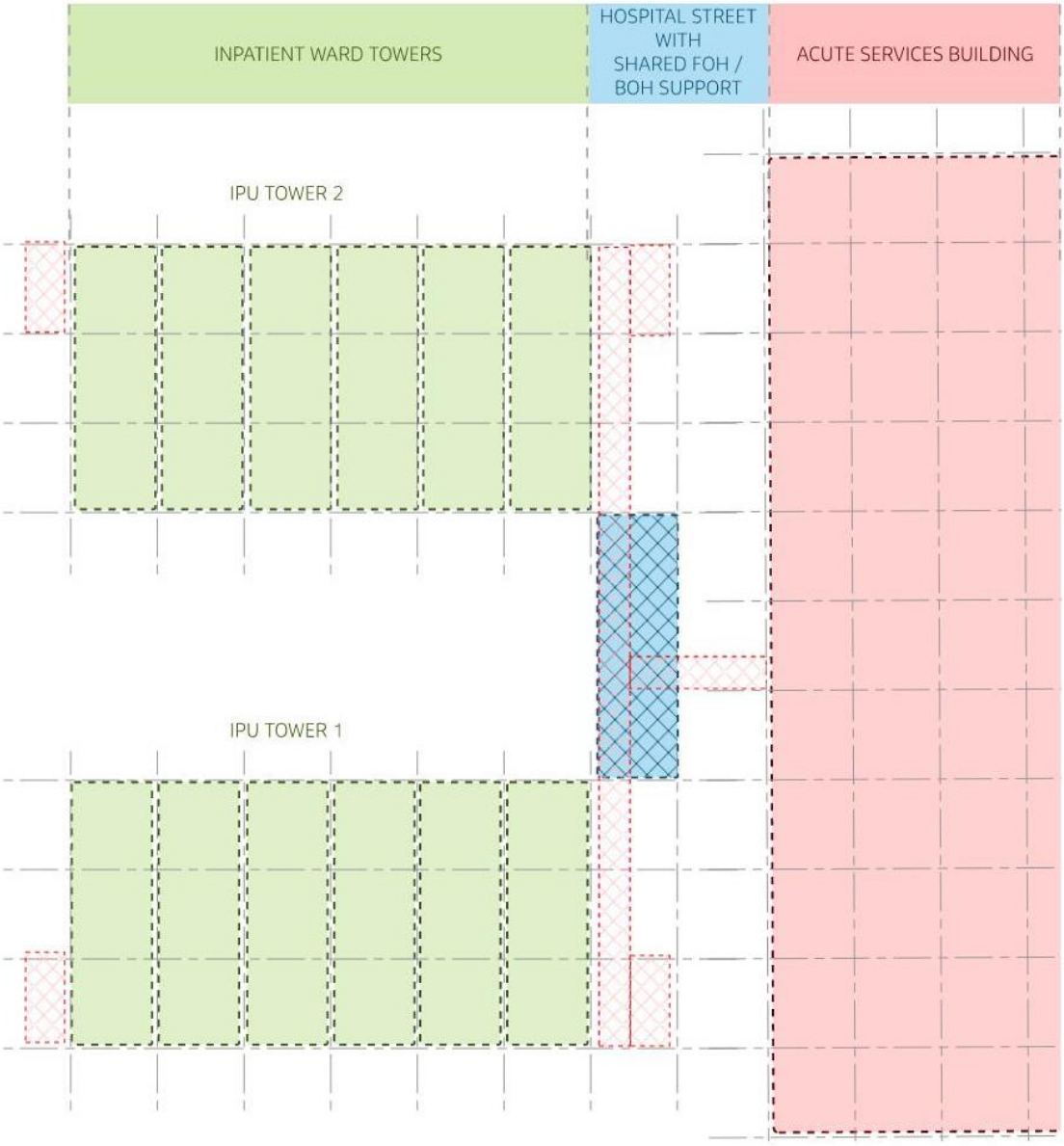


Figure 2: Arrangement with second IPU Tower and Acute Services Building



Recommendation

When arranged on a campus with additional adjacent “Acute Services Buildings” or additional Inpatient Ward Towers, the 1x3 Grid Module is to be used once and shared between the additional building structures.

Health Planning

Health Planning Key Modules

Repeatable Room Arrangement Decisions

The AusHFG HPU for the Adult Acute Inpatient Unit provides a framework for the development of the Functional Design Briefs and associated Schedules of Accommodation.

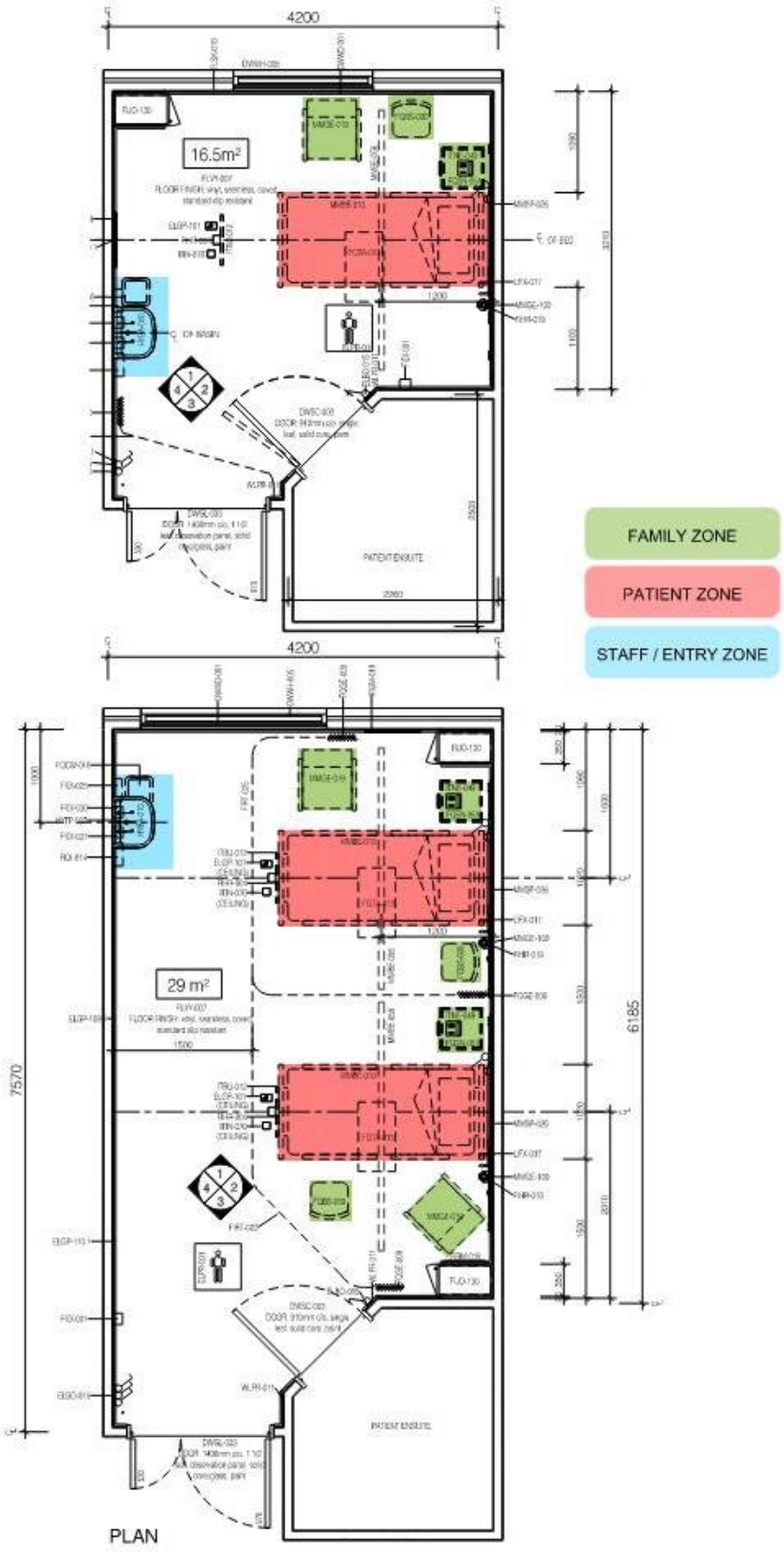
Key to this development is the use of Standard Components for a variety of repeatable clinical functions. The HPU offers optionality in its catalogue of Standard Components. Through the "Collation and Analysis, and Workshop Phase," these options were discussed and agreed upon.

A summary of these key Modules is noted below.

Table 1 (Repeatable Room Arrangement Recommendations & Decisions)

Room Type	AusHFG Code	Size (sqm)	Room Arrangement Decisions
1 Bedroom	1BR-ST-A2	16.5 sqm	• Inboard ensuite • Bedhead opposite entry side • Mirrored (rather than same handed rooms) to enable a shared entry threshold to pairs of rooms
2 Bedroom	2BR-ST-A2	29 sqm	• Inboard Ensuite • Bedhead opposite entry side
Sub Staff Station	-	5 sqm	• Sub staff station is accommodated opposite 2 x 2 bedrooms with the ability for higher observation closer to a 4-bed cluster
Ensuite Configuration	Various	5 sqm	• Generally inboard, but for Bariatric rooms and Isolation rooms, these are to align with AusHFG configuration

Figure 3: Functional Zones in AusHFG 1 & 2 Bed Room Standard Components



Planning Principles

Repeatable Room Arrangement Decisions

In addition to the Key Health Planning Modules, several foundational planning principles underpin the layout of the reference ward.

Including:

Racetrack or Single Corridor Design

- Racetrack configuration chosen as preferred layout. Clear separation between front of house (FOH) lifts and facilities, and back of house (BOH) / patient bed lifts.

Bed Distribution / Typology Grouping

- 1 Bedrooms / 2 Bedrooms grouped on opposite sides of race-track.
- Some 2-Bed rooms near the staff stations for higher acuity observation
- High dependency rooms (isolation and bariatric bedrooms) grouped close to patient bed lifts and unit entries

Staff Station utilisation and distribution

- Staff Station (and clinical workroom) at the front of the unit. Allows inclusion of the ward clerk at the staff station.
- Secondary staff station observing a pair of 2 bed rooms (for high observation)

Utility space distribution

- Clinical support cores created in the central zone of the racetrack design.
- Preference for access via both patient corridors
- Allows a degree of flexibility in location/sizing of services risers and cross circulation corridors.

Shared Spaces

- 1x grid (1 x 3) worth of functional space able to be shared when reference IPU layout considered in conjunction with a second inpatient ward tower or acute services building.
- FoH shared spaces – noted these could be located in the shared zone between departments.
- BoH shared spaces – note staff toilets/showers could be shared between departments. Showers are not required if there is a sitewide end-of-trip facility.

Figure 4: Functional zones within reference IPU

Fire Strategy

Fire Engineering

Background

Compliance with the New Zealand Building Code is expected to be demonstrated with reference to the Design Guidance Note: Fire Engineering Design for New Zealand Public Hospitals.

Assumptions

The patients accommodated in the IPU are expected to be P2 or P3 categorisation under the DGN. P1 occupants are not allowed for.

The building the reference ward is located in is limited to an escape of 18 metres. For a building with a 4.5 metre floor-to-floor height this is a maximum of 5 levels only.

General Principles

The 32 bed ward will need to be subdivided into a series of individual firecells to enable patients to be initially evacuated horizontally to an adjacent firecell. The size of this cell is determined on bed numbers, with a maximum area per cell of 500 sqm.

The number of beds per firecell is dependent on the availability of staff within the HPU, who are located such that they can immediately commence evacuation of patients. The DGN gives the following guidance:

- 6 or greater staff available = 20 beds
- 4 – 5 staff available = 12 beds
- 2 – 3 staff available = 8 beds

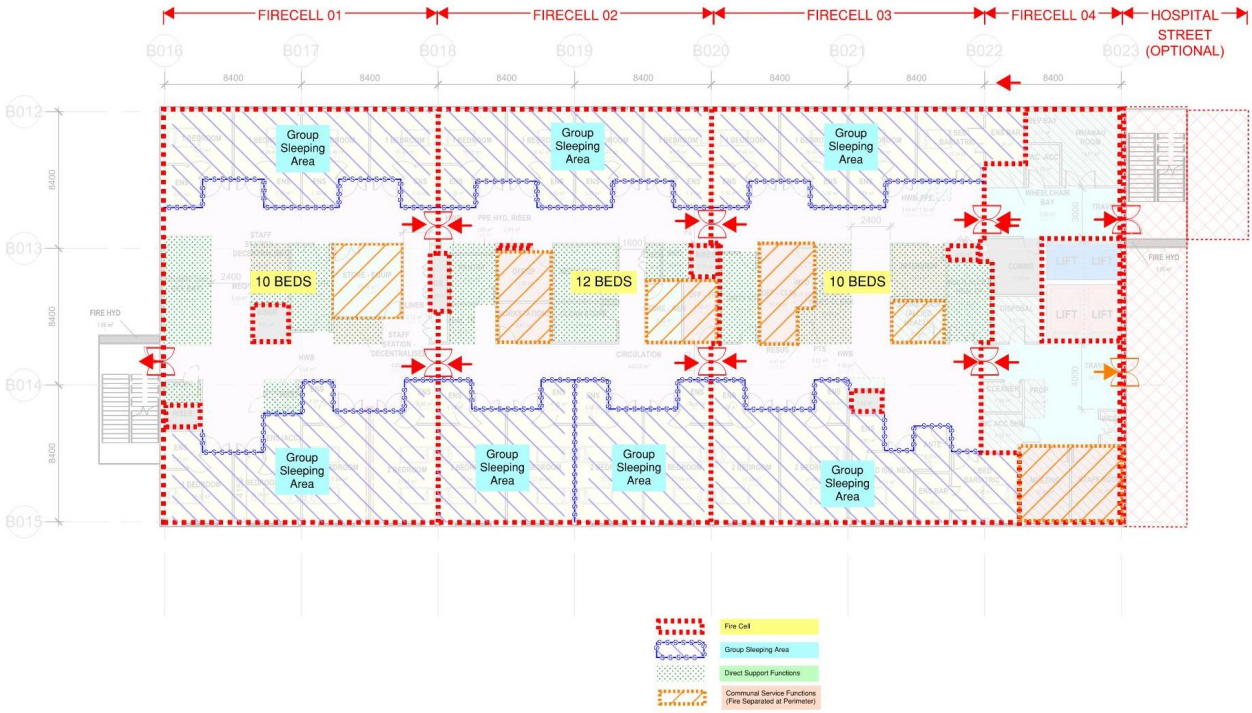
Each of these firecells should have two separate means of escape. This can either be achieved via escape into:

- two different adjacent firecells or,
- one adjacent firecell, and the other into a stair egress route

The reference ward is designed as a ‘group sleeping area’. Many ancillary and support spaces can be in the same firecell as group sleeping area (direct support functions), but some are required to be fire separated (communal service functions).

If a group sleeping area firecell has more than 6 beds then all walls subdividing the space are required to be smoke walls. If it has 6 beds or less, then they can just be normal non fire or smoke rated walls.

Figure 5: Potential fire strategy breakdown (based on minimum 4 staff)



Recommendation

Confirmation of minimum staff available to assist in evacuation is critical to the buildings fire strategy and fire cell size. Project teams should seek to confirm numbers in early design stages, or if unable to be confirmed, clearly state assumption and how it has defined the fire cell strategy

Health New Zealand overnight staffing policy for a 32-bed ward includes:

- 4x Nurses
- 2x Healthcare Assistants (HCA)
- 1x Resident Medical Officer (RMO)

Services Engineering

Building Services

Background

The building services strategy can have significant implications to the arrangement and composition of health planning units. As a building wide system, its design takes into consideration not just the individual floor plate, but the full building system. As such, the following general and discipline specific principles have been implemented within the reference ward.

General Principles

- Plant rooms are located on the building rooftop. Additional considerations are required for split or on-floor plant.
- Services runs located in the corridors (where possible) with access via the ceiling.
- Minimum 1.2m clearance (underside of beam to ceiling) in-ceiling for services reticulation through the department.
- Combined pipework riser to run the entire vertical length of the building containing Mechanical, HHW/ CHW, Medical gases, Hydraulic DHW/DCW. Co-location of other like services to maximise floorplate efficiencies where available.

Mechanical

- HVAC plant to be located on the roof (max 5 floors with the top floor served directly from the roof, not through a riser).
- Dedicated AHU/s per floor per 32 bed.
- Main ventilation risers to be geographically separate and matched to fire compartment designation where possible.
- Floor riser to have minimum 3 sides clear and not reticulate under wet areas when rolling services out.

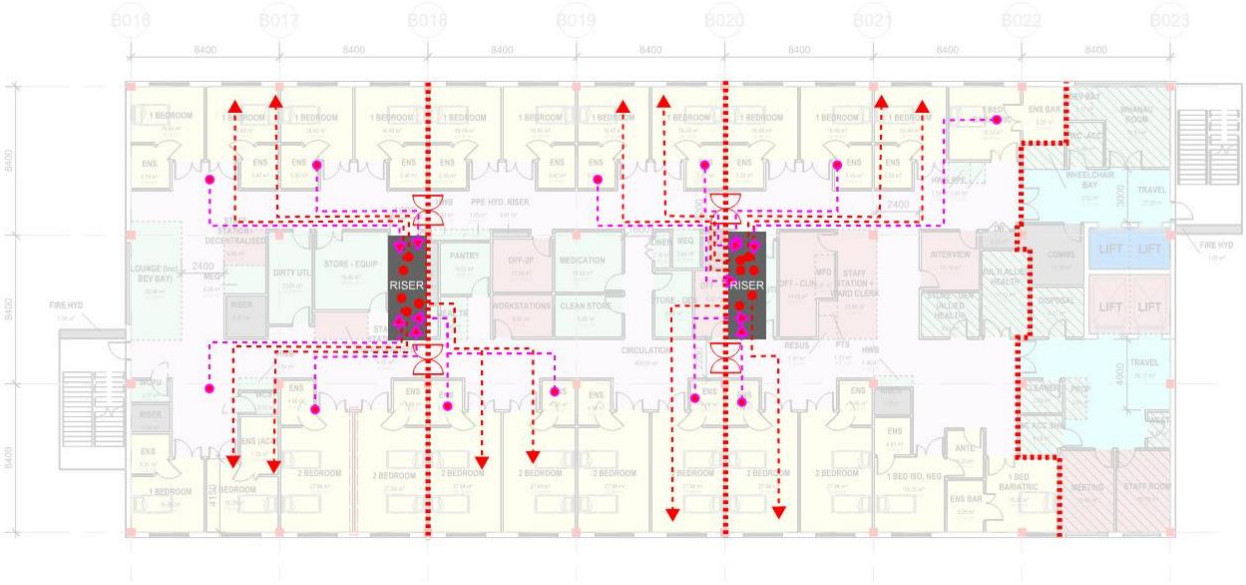
Electrical/ICT

- Floor Distribution Room (FDR) 1x Floor Distribution Room (FDR) Comms room per 32 bed IPU and to double as a riser (FDR Room stacked on top of each other).
- Minimum area = 12m2. Refer to HISO-10105-2025 for typical room arrangements and layouts. Maximum design distance of 60m to furthest room.
- Distribution Board cupboards to be located in the off main clinical circulation corridors where possible.
- Maximum distance of 30m radius of the furthest point

Hydraulic

- Hydraulic stacks to be within columns wherever possible. Where this cannot be achieved, additional hydraulic stacks may be required.

Figure 6: Potential service reticulation strategy (combined central risers)



Recommendation

Proposed building services reticulation strategies are to be reviewed against proposed structural systems and fire strategy during early design to ensure alignment.

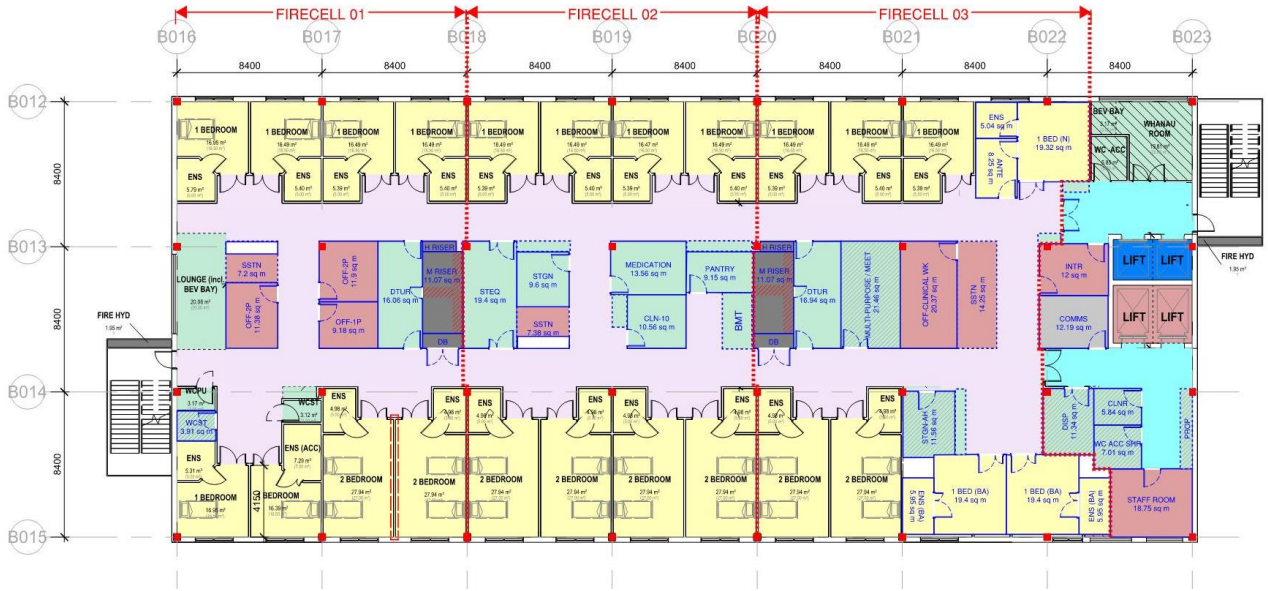
Recent AusHFG Updates

HPU 0340 – Adult Acute Inpatient Unit

Revision 8

In August 2025, the AusHFG's released an updated Adult Acute Inpatient Unit (HPU 0340, Revision 8). Following this revision, the reference ward Schedule of Accommodation has been updated to reflect the latest requirements.

Figure 7: Alternative Test-to-fit using central riser strategy, 4x fire cell fire strategy, and updated AusHFG HPU and SoA



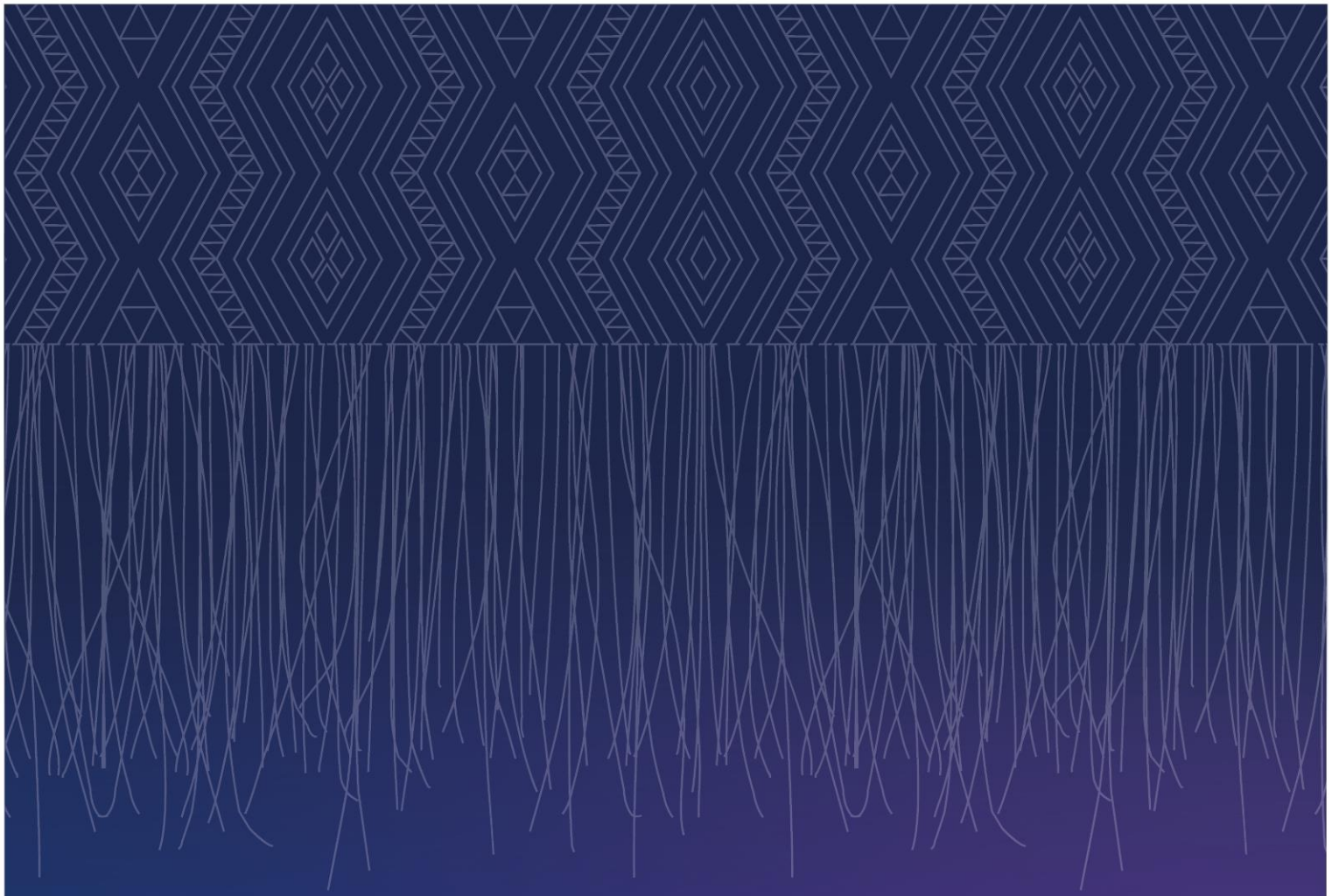
Recommendation

This document and supporting Reference Designs will be reviewed regularly to ensure its findings and recommendations remain relevant. Key developments that should initiate a review include:

- The release of relevant updates and revisions to the AusHFG's,
- During the implementation of this Reference Ward on a live project, at significant project milestones (e.g. 70% Concept).

Appendix A

Notes



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