Fact Sheet: nWCH Concept Design – Block and Stack

The Project has now transitioned from the Planning Phase into the Concept Design Phase. A key component of this is to identify where individual departments will be located and the area that they will occupy within each floor of the building known as ‘blocking and stacking’.

The Aboriginal Advisory Group, Consumer Advisory Group, Corporate Advisory Group and the nWCH SELT/ Clinical Advisory Group have been engaged as part of the concept development phase. There have been several rounds of engagement with each of the Advisory Groups to help inform the ‘blocking and stacking’ of the building.

In addition to the Block and Stack plans, the design phase also considers a number of factors such as clinical safety, patient experience, efficient patient flows, security, wayfinding, pandemic response, environmentally sustainable design features and engineering services.

Contemporary healthcare design supports the minimisation of movements through the building, to support safe and efficient care which is also particularly important during pandemics, like COVID-19.

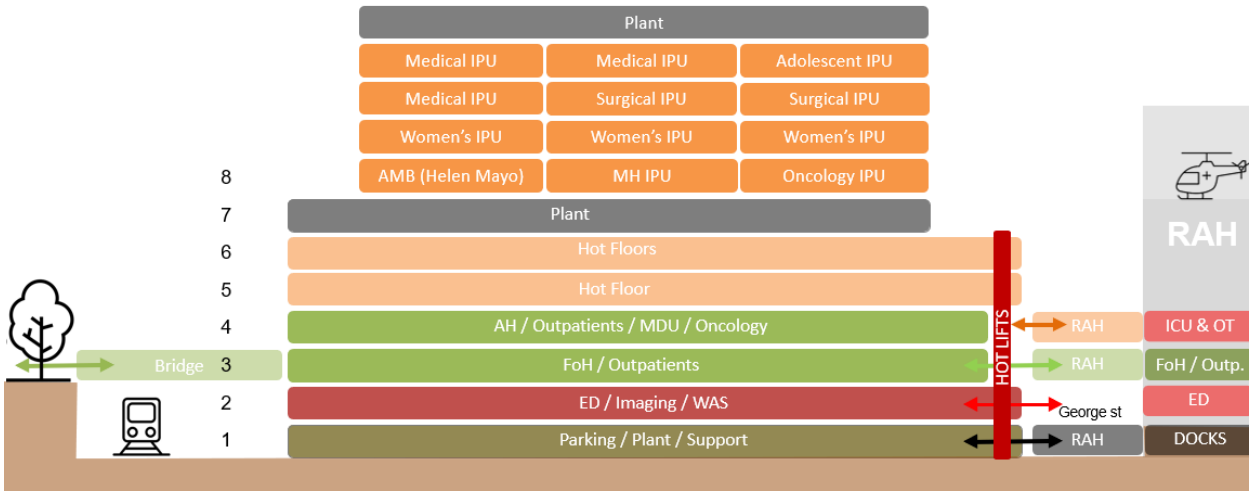
Clinicians, hospital staff, consumers and the South Australian community are invited to provide feedback on the ‘block and stack’ drawings during a three-week consultation period which runs from 2 – 22 November 2021.

nWCH CONCEPT DESIGN APPROACH – BLOCKING AND STACKING

The development of the nWCH ‘blocking and stacking’ has been informed by the following:

- nWCH Project Vision, Guiding and Strategic Design Principles
- Functional Design Brief and Schedule of Accommodation
- Engagement with the Advisory Groups
- The need to provide a hospital that supports; clinical safety, efficient patient flows, pandemic mode, resilience, fast and reliable vertical transportation (lifts), efficient and functional engineering systems, enhances consumer experience and support future flexibility.

Figure 1 – Illustrates a ‘high level’ section of nWCH Block and Stack



The nWCH is a vertical hospital site that is 12 levels high. There are global and national precedents that have demonstrated the benefits of a vertical hospital design such as:

- Queensland Children's Hospital (12 levels)
- Royal Brisbane Hospital (11 levels)
- The Royal London Hospital (18 levels)
- Texas Children's Hospital (28 levels)
- Guy's and St Thomas Hospital London (34 levels)

There a several benefits of a vertical hospital solution such as providing more efficient design that supports a healing environment by maximising access to natural light and views. Vertical hospital solutions can reduce travel distance, provide efficient patient flows and work processes, reduce waste and provide closer proximity to equipment and services.

Example of a vertical hospital

Vertical Transportation (Lifts)

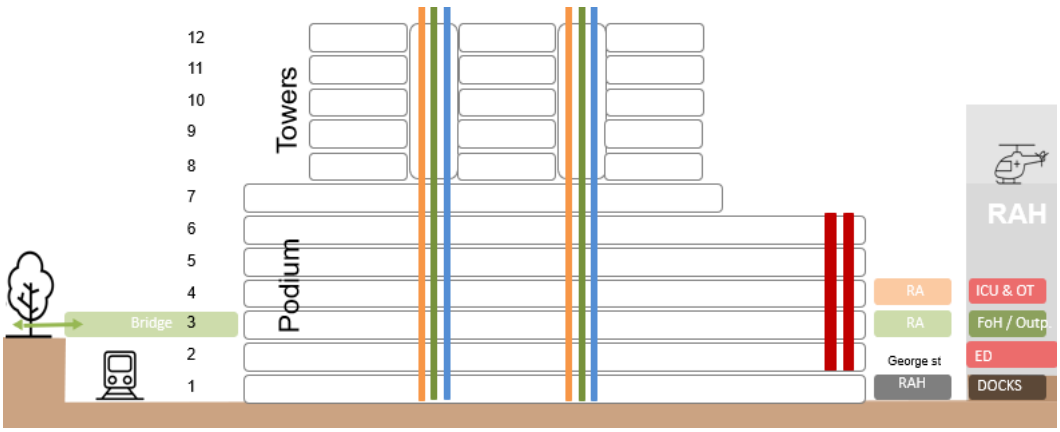
Contemporary healthcare design and vertical hospital solutions are supported by the advancements in the next generation of Vertical Transport (lift) technology.

The nWCH will have in the order of 24 lifts including two dedicated emergency 'hot lifts', compared to 14 lifts on the main existing WCH site. 'Hot lifts' are larger than typical clinical lifts to allow for additional equipment and staffing requirements.

The nWCH vertical transportation strategy has separated public, logistics (goods and services), clinical bed and dedicated emergency 'hot' lifts enabling traffic flows to be optimised and improving access to services. The existing WCH site does not currently provide the same level of separation.

Figure 2 – Overview of the Configuration of Vertical Transportation at the nWCH

- There are two main vertical transportation cores with several lifts within each core
- Total of **6 x clinical bed** lifts, **8 x public** lifts, **6 x logistic** lifts and **2 x** dedicated **hot lifts** and 2 x minor public lifts for access from Port Road and George Street.



- Average lift waiting times: **Hot lifts:** 10-15 seconds, **Clinical:** 20-30 seconds and **Public:** 30-50 seconds, noting that priority call can be used, and lifts can be programmed to open and wait for an emergency transfer on a particular floor.
- Improved lift performance compared with the existing WCH site.
- Targets benchmarked in accordance with national health guidelines.

- The hot lifts are positioned near the RAH to minimise horizontal movement and optimise patient transfer times. It can be faster to move patients via lifts as opposed to moving them longer distances between departments.

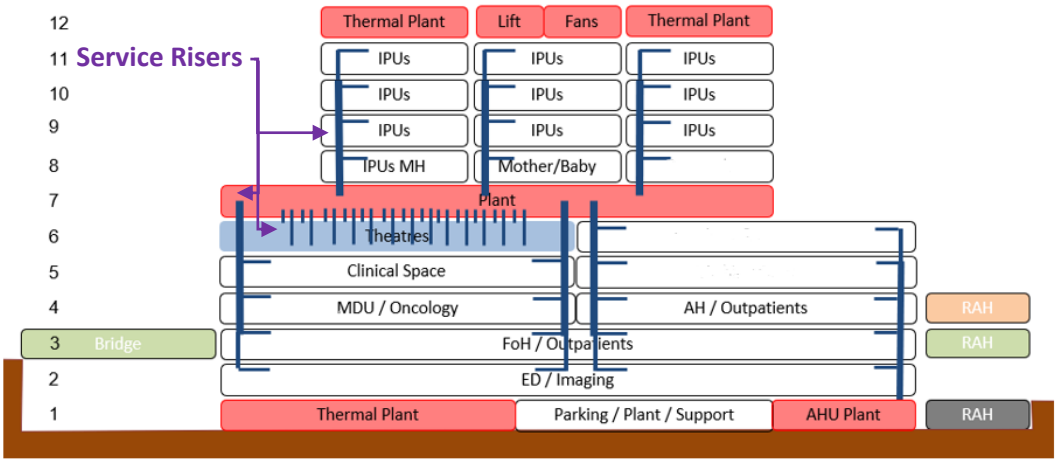
Engineering Services – Impact on Block and Stack

The nWCH is supported by engineering services that provide electricity, water, heating, cooling, ventilation, medical gases, fire systems, ICT and structural support. In order to operate the hospital, engineering plant is required to be located in key areas throughout the building.

Engineering services run from the engineering plant areas through the ceiling and large ducts referred to as 'service risers'. Service risers are strategically positioned throughout each floor and because they can take up significant floor area they are placed in key areas to limit the impact on the health planning solutions and layouts of departments.

The theatre complex (Peri-operative) is heavily serviced by engineering infrastructure. This requires large mechanical services (air handling units) to directly feed into each of the theatres. Locating the majority of theatres directly below the engineering plant means that large service risers are avoided by providing the engineering services directly into each theatre.

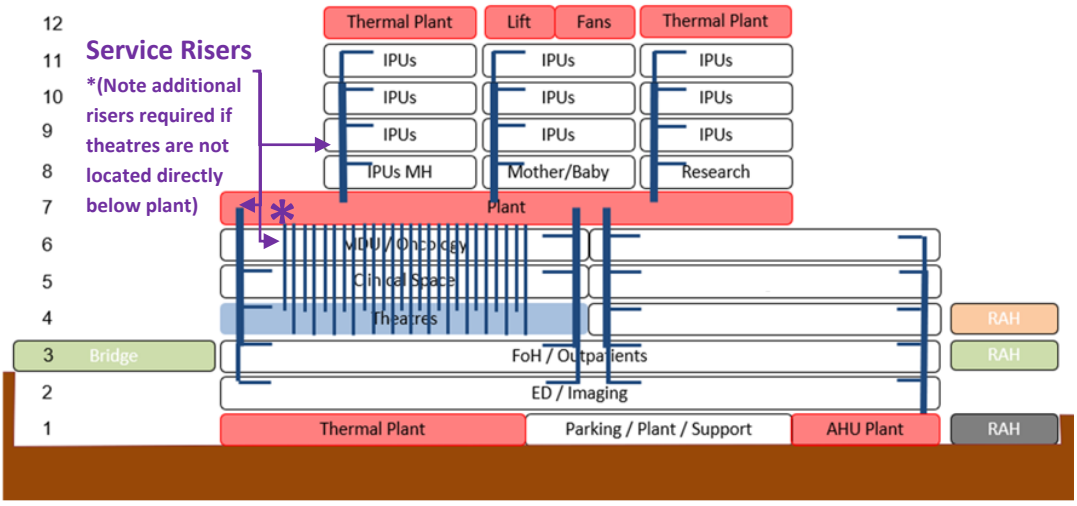
Figure 3 - Section of 'Service Risers' from Engineering Plant on Level 7



If the theatre complex is not located directly below the engineering services plant it would mean that additional large service risers would be required on the floors in between the engineering plant and theatres. This would impact the health planning opportunities, the floor area available and future flexibility of these floors.

This would equate to approximately 14 additional risers taking up 6m² per riser on each floor. These risers are in addition to columns that hold up the building providing another obstacle to design and plan around. (6m² is approximately one and half times bigger than a king size bed.)

Figure 4 -'Service Risers' from Engineering Plant on Level 7 to theatres on a lower floor

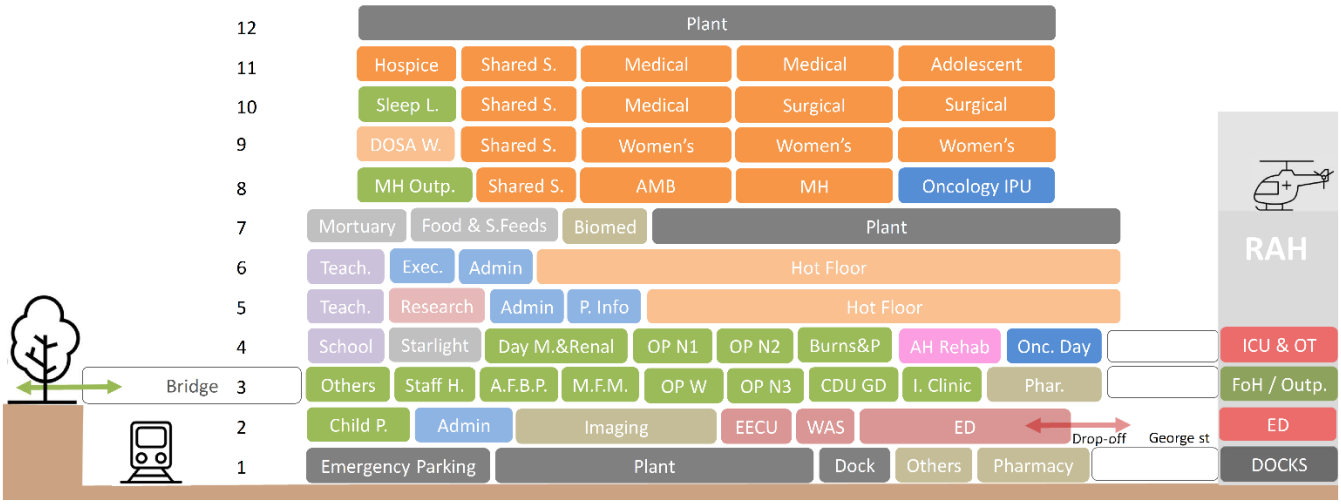


Blocking and Stacking

The blocking and stacking is a 'high level' design process which shows the relationships between the clinical functions, services, building and other facilities both horizontally and vertically. Blocking and stacking will identify where individual departments will be located and the area that they will occupy within each floor of the building.

A summary of each level is provided below. Detailed plans of each level are available on our website: wch.sa.gov.au/nWCH.

Figure 5 – Section providing a high-level summary of the key departments on each level



LEVEL 1

- On level 1 you will find the Home Equipment Centre, approximately 50 on-call staff and emergency carparks, Back of house (BoH) services, the loading dock and engineering services plant.
- Loading dock, emergency on-call staff and emergency consumer parking is directly accessible by George Street.
- Level 1 BoH services has a direct link to RAH to leverage shared services and to separate goods and services movements (logistics) from public and clinical flows.

- Level 1 is partly submerged underground making it ideal location for BoH and general engineering plant services such as water storage, the fire pump and control room, chillers, medical gases and electrical services.

LEVEL 2

- The Emergency Department and the Women's Assessment Service is co-located with the ambulance bay, Emergency short-term parking and drop-off.
- The Medical Imaging Unit and Child Protection Unit is also located on this level.

LEVEL 3 and 4

- Level 3 provides the main public entrance to the hospital. It is directly connected via a Park Bridge allowing pedestrian connection as well as vehicle drop-off and pick-up at the Main Entry to the nWCH.
- Level 3 includes the main atrium that provides natural light into the building and enhances wayfinding and the consumer experience.
- Co-location of outpatients and ambulatory care on levels 3 and 4 will minimise public flows by reducing visitor movements to the lower levels of the building away from the critical care areas and inpatient units (IPUs).
- Contemporary healthcare design supports the minimisation of movements through the building, to support safe and efficient care which is also particularly important during pandemics, like COVID-19.

LEVEL 5 and 6 – 'Hot Floors'

- 'Hot floors' are the levels that house critical care and intensive functions such as the Paediatric Intensive Care Unit (PICU), the Neonatal Intensive Care Unit (NICU) and the Special Care Baby Unit (SCBU), birthing, operating theatres (Peri-operative), and support functions. These levels will also include Research and Clinical Trials, and Teaching and Learning.
- The 'Hot floors' will be located on Levels 5 and 6.
- Two scenarios have been developed that identify how these services and departments may be best located and the areas they will occupy over these levels.
- The theatre complex (Peri-operative) will require direct access to the engineering and services plant on Level 7 to provide the most efficient option. This will reduce the impact of engineering services risers (large ducts running from mechanical plant to the theatres) on the available floor area.
- The 'hot floors' have direct access to the 'hot lifts' which provide dedicated and direct access to Emergency Department and Women's Assessment Services on Level 1 to the level 4 clinical link between nWCH and Royal Adelaide Hospital.
- nWCH hot floors will have timely access to the RAH via the clinical link on level 4. Patient movements from the nWCH 'hot floors' to the RAH will typically be stabilised before transfer to Adult services.
- Two scenarios have been presented that considers health planning outcomes, critical adjacencies, patient safety, patient flows, pandemic capability, operational efficiency, future flexibility and expansion.
- Further evaluation of the two 'hot floor' scenarios are required to be explored to determine the best option that meets the organisations future model of care.
- A 'Hot Floor' working group has been established to work through the options and to determine the location of departments on levels 5 and 6.

LEVEL 7

- The mortuary is centrally located with direct access to a reflective garden outdoor space.

- Engineering Services Plant is located on this floor to directly service the ‘hot floors’ and levels below, and service IPU levels above. This location provides the most efficient option and has the least impact on the clinical floor areas.
- The Level 7 engineering services plant provides air handling unit (AHU) plant room providing conditioned air supply to the majority of the building. This is located on level 7 as it is centrally located so it can service the upper and lower levels of the building and has direct proximity to the operating theatres (peri-operative space) below.
- Food services is located on this floor with direct access to logistics lifts that connect food services with the nWCH loading dock and back of house functions on level 1.
- Biomedical engineering is located on this floor with proximity to the ‘hot floors’ and IPUs for easy access to service major medical equipment.

LEVEL 8

- The Mental Health Inpatient Unit, Helen Mayo House and associated Outpatient functions are located on Level 8, providing direct clinical access to a dedicated mental health outdoor space.
- The Haematology and Oncology Inpatient Unit is also located on Level 8.

LEVELS 9-11

- The majority of inpatient units are provided on levels 9, 10 and 11, providing an efficient and effective layout to support patient care and access to natural light and views.
- The IPUs included Paediatric Medical, Paediatric Surgical, Adolescent, Women’s Postnatal and Antenatal wards.

LEVEL 12

- Engineering services that are required to be outside the building are located on level 12 to support the operations of the hospital.
- Air-cooled chiller plant and associated pumps, tanks and heat exchangers to provide heating water for air conditioning. Required to be located at Level 12 due to vast air quantities required for plant operation, which realistically requires location directly open to atmosphere.
- Cooling towers and associated pumps, tanks and heat exchangers to provide condenser water for air conditioning and process cooling. Required to be located at Level 12 due to vast air quantities required for plant operation, which realistically requires location directly open to atmosphere.