

6.0 Description of the Proposed Development

6.1 The project

MUPH is seeking to construct a new private hospital in combination with other complementary facilities such as radiotherapy, imaging and physiotherapy, to establish a major medical precinct to complement the teaching services offered by Macquarie University adjacent.

Project Approval is sought under Part 3A of the EP&A Act 1979 for the following elements of the development:

- maintaining existing development rights on Site 1 (LDA 676/2001) which has attained physical commencement and has paid Section 94 contribution to Ryde Council
- Declaration that Site 1 can now be considered as Part 3A application.
- Demolition of all buildings and structures on Site 2;
- Staged construction of a new private hospital on Site 2 including associated site, landscaping and infrastructure works and a pedestrian bridge across Technology Place (connecting to Site 1);
- Amendments to the basement, internal layout and facade of the Site 1 building approved under LDA 676/2001; and
- Use of the Site 1 building as medical consulting rooms and the like in conjunction of the private hospital.

Construction is proposed to be done in two stages. The first stage will include: -

- Demolition of an existing building currently accommodating Macquarie University Office of Facilities Management
- Construction of a new 5 storey building above ground and one level of basement car park;
- 144 bed private hospital beds including associated support functions
- 2 Retail shops, a coffee shop, medical imaging services area and physiotherapy/hydrotherapy on ground level;
- Loading dock area for deliveries

It is proposed to link the private hospital via an elevated enclosed bridge to another building (referred to as the Specialist Centre) yet to be constructed, on a site to the north of Technology Place (LDA 676/2001). This building will house consulting spaces as well as University research and teaching spaces associated with allied health services taught at the University. This work will be undertaken as part of Stage 1.

Stage 2 of the private hospital may include-

- the expansion of operating theatres on Level 1, which will occur over the current loading dock to the south west of the site
- Additional 5 patient bed bays to recovery on the east of the side.
- An additional floor comprising 64 private hospital beds

The car parking needs of the development will be met by a combination of underground car parking in this building plus 242 in the adjacent Specialist Centre (LDA676/2001), all to be constructed as part of Stage 1. The proposed hospital development will provide 238 spaces whilst a total of 470 car parking spaces are proposed.

The Gross Floor Area summary at the completion of Stages 1 and 2, and corresponding Floor Space Ratio calculations are summarised in the following table:

Floor Level	Stage 1 GFA m2	Stage 2 GFA m2
Basement B1	130.5	130.5
Basement B2	894	894
Ground	4192	4192
Level 1	4442.5	5021.5
Level 2	1782	1782
Level 3	2230	2230
Level 4	2230	2230
Level 5		2230
Totals	15,901	18,709
FSR	1.69	1.99

The floor space ratio falls within the allowable 2:1 of Ryde Councils Draft DCP 55.

6.2 Alternatives

This section sets out the rationale for the selection of the site at Macquarie Park.

Dalcross Hospital has been based in Killara on the since 1912 and has strong links to the lower North Shore community, both physically and operationally. The Hospital has reached capacity and is in need of new, modern technology in a teaching and research friendly environment.

Having determined that the lower North Shore is the best location to expand their facilities and further develop immediate linkages with research (at Royal North Shore Hospital), Dalcross has previously explored 5 other alternative sites which are discussed in further detail below.

Alternatives considered were;

- Redevelopment of existing site
- 3 sites in Chatswood Town Centre
- Site in Gordon

Originally several schemes were investigated for the Redevelopment of existing site at Killara, involving expansion of the existing buildings onto adjacent residential properties.

This was discounted because -

- small site area available would not match future needs
- high capital cost of acquiring and rezoning adjacent land
- incompatibility with adjacent residential land uses
- access problems including distance from public transport, and lack of parking
- interruption of service whilst redevelopment was undertaken
- no immediate linkages to research opportunities

Chatswood was then considered because it is a –

- Major Transport node reinforced by the Epping to Chatswood rail link and Lane Cove tunnel (both nearing completion)
- Major commercial centre

3 sites in were explored within Chatswood Town Centre, including two on land owned by NSW Health at Hercules, Olga and Albert Streets and Chatswood District Community Hospital, Victoria Avenue.

The sites were not part of the long-term development plans of the Northern Area Health Services and it was proposed to relocate the existing community health services housed in cottages on the land, to the Main Campus at RNSH. The land was appropriately zoned for medical purposes and subject to local Willoughby Council requirements, and could be used for facilities that are much needed by the community.

Both sites were discounted because -

- Delays involved in acquiring public land
- council restrictions on site development, ie height and access
- community concerns about the closure of health services currently operating on the land
- areas to the north are zoned 2C residential which has a height limit of 3 storeys and on the south side of Albert Avenue and east side of Olga Street are conservation areas with predominantly single storey and some 2 storey buildings. These constraints limited the development potential.

Subsequently, another site in Chatswood, the Albert Ave and Archer St Carpark was explored. In mid 2005, Willoughby City Council (as the landowner, invited expressions of interest from the private sector, for a long term (99 year) lease or freehold sale of a 4,750m² parcel of land, which currently houses a Council operated pay carpark. It was identified by Council as surplus to its requirement due to the nearby proposed Civic Place development. Dalcross submitted an Expression of Interest in November 2005, but was unsuccessful.

Finally a site, known as 890 Pacific Highway, Gordon located near the intersection of Pacific Highway and Mona Vale Road was investigated. The site of some 4700m² contained car show rooms, workshops and other small commercial buildings.

This site was discounted because -

- council restrictions on site development
- small site area
- access problems due to major road frontage
- distance from railway station and bus transport

None of the above locations had strong, immediate relationships to higher education/research facilities so that when the opportunity for a location next to Macquarie University had arisen, the obvious advantages were apparent, namely: -

- directly adjacent to a research orientated university campus
- site is within Macquarie University Research Park, home to a number of leading Australian and international companies specializing in like interests
- directly adjacent to major retail precinct (Macquarie Shopping Centre)
- within 500m of the soon to be completed Macquarie University Station
- within easy walking distance of transportation networks and major bus routes
- direct access to the Epping Road, Lane Cove tunnel and the Orbital Motorway.
- Future transport initiatives, including the M2/F2 connection will make North Ryde accessible from locations throughout the Sydney metropolitan area

6.3 Construction Staging

Initially the proposed development will comprise the following facilities in Stage 1:

Building Level	Facility
Basement B1	Car park for 238 cars and Ambulance Bay
Basement B2	Radiotherapy Unit – 2 bunkers, amenities, 4 patient holding bays
Ground Floor	Northern Entrance Reception, Administration, Admissions Coffee Shop Retail Medical records Medical Imaging Loading dock and carpark accessed from Innovation Drive Kitchen and staff dining Stores Public amenities
Level 1	Operating Suite, 10 theatres, 17 recovery bays Day Surgery stage 2 recovery, 24 cubicles Staff Lounge 10 Intensive Care beds 10 Cardiac Care beds Associated services
Level 2	Plant Central Sterile Unit Future procedure (shell only)
Level 3	2 Wards, 31 beds (total 62 beds)
Level 4	2 Wards, 31 beds (total 62 beds)
Level 5	Future Wards (shell only)
Level 6	Plant Room/Lift Motor Room

Total beds: 144

Refer to **Section 12.4** for drawings of Stage 1

In Stage 2, the proposed development will be expanded to accommodate the following facilities:

Building Level	Facility
Basement B1	Car park unchanged
Basement B2	Radiotherapy Unit unchanged
Ground Floor	Unchanged
Level 1	Additional 4 theatres, Additional 5 cubicles for Day Surgery Stage 2 recovery,
Level 2	Plant (unchanged) Central Sterile Unit (unchanged) Fitout of procedure shell comprising chemotherapy, day surgical procedures and angiography
Level 3	2 Wards (total 62 beds unchanged)
Level 4	2 Wards (total 62 beds unchanged)
Level 5	Fitout 2 Wards, 31 beds (total 62 beds)
Level 6	Plant Room/Lift Motor Room (unchanged)

Total new beds: 64

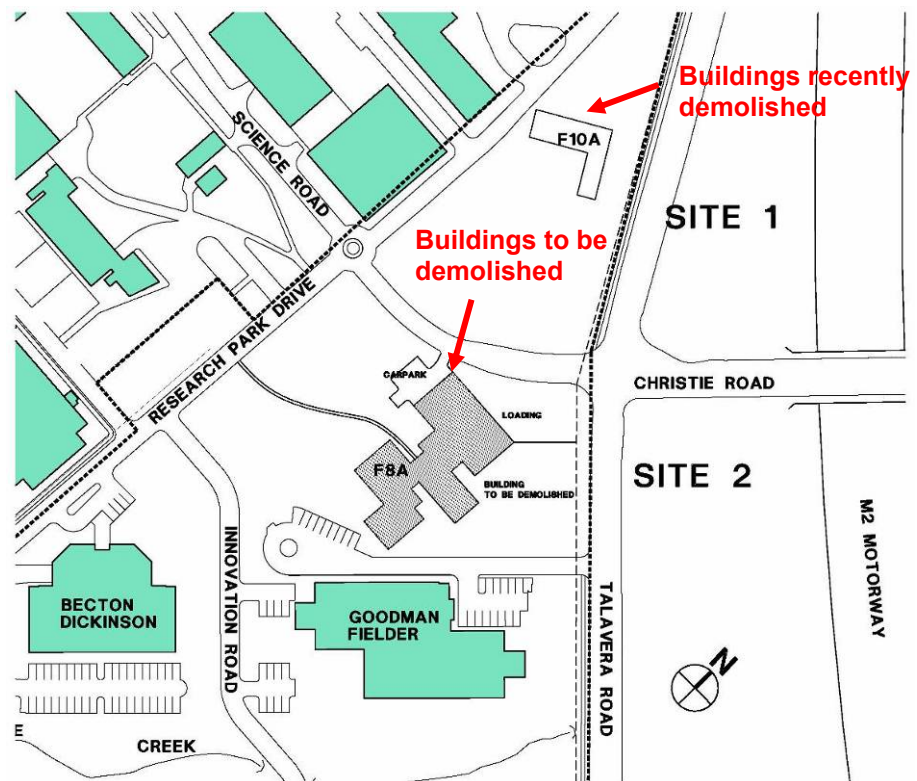
Refer to **Section 12.6** for drawings showing Stage 2

Final bed number at completion of Stage 2 = 208

Note: The number of beds counted as licensed beds may vary from the number of beds counted for the calculation of traffic generation and car parking.

6.4 Demolition

Prior to construction existing functions/services will be decanted from building F8A, a domestic scale, single storey structure, with adjacent workshop, currently accommodating Macquarie University's Office of Facilities Management. The displaced services will be consolidated in the one location across campus. Existing buildings and structures on Site 2 to be demolished are shown in **Figure 22**.



Demolition Plan (Figure 22)

6.5 Operation

6.5.1 Hours of operation

The hours of operation are in keeping with a major Hospital, that is 24 hours per day, 7 days a week.

Visitors will be admitted at set times during the day.

Access to the basement car park will be via the central lift bank.

6.5.2 Deliveries

Deliveries are proposed to be made as follows, to the loading dock situated off Research Park Drive -

Type	Daily	Weekly	Monthly
Linen	1 (in am)		
Medical Supplies		2	
Food Delivers	2		
Small Couriers	4		

Oxygen and other medical gases will be delivered to the loading dock or to the oxygen tank located off Innovation Road.

Type	Daily	Weekly	Monthly
Gases – Oxygen			1
Gases – General		2nd weekly	

6.5.3 Waste

Solid, contaminated recyclable waste will be collected from the dedicated area in the loading dock.

Type	Daily	Weekly	Monthly
General Waste	1 (in am)		
Contaminated Waste	1 (in pm)		
Recyclable Waste		2	

Trade waste (liquid) is usually that waste (water) which is discharged to public sewers from industrial or commercial processes. It is liquid containing substances used in the manufacture or processing of food preparation or industrial process but does not include domestic waste from showers, water closets, basins and sinks.

This type of liquid waste will be identified and reference made to NSW Health Guidelines and Sydney Water Trade Waste Standards. Wastes not acceptable for direct discharge to sewer mains shall be identified and a pre-treatment method incorporated in the design that will treat or break down the strength or temperature of the liquid waste so that compliance with the Standards is achieved.

Examples of the types of pollutant that "on site" pre-treatment plants will remove, dilute, neutralise or arrest are, but not necessarily limited to:

Type of Pollutant	Example	Hospital Department Producing Pollutant
Floatable	Grease	Kitchen
Suspended	Solids	Plaster room
Chemical	By-Products	Laboratory, hydrotherapy pool
Thermal	Heat	Sterilisers
Biological	Dangerous Pathogens	Laboratories
Toxic Products	Cyanide, Metal Trace Elements	Laboratories, Medical Imaging, Oncology, Endoscopy
Active Products	Radioactive Waste	Nuclear medicine
Biochemical Oxygen Demand (BOD)	Organic Degradation	Kitchen waste

In each case of anticipated trade waste discharge, the regulatory Authority must be approached with the anticipated discharge.

The hospital will have a number of options for meeting the standards for trade waste discharges set by the regulatory authorities. These are:

1. Eliminate the waste or minimise it.
2. Pre-treat the waste before discharge to sewer.
3. Reduce the concentration of contaminants to acceptable levels.
4. Separate the waste and have it removed from the site by other means (usually contractor).

Of these, 1 and 4 are management issues and will be considered at planning stage before the alternatives are incorporated in the design.

Consideration will also be given to the minimisation of processes and the use of products, which are trade waste generators. For example, cooking arrangements should minimise the use of oil and fats. Where possible recovery of such cooking by-products should be at the point of origin rather than by removal from waste water.

As part of the scheme design phase of the project, a "Waste Audit" should be undertaken for all types of waste (solid or liquid). The audit can then be used to assist in deciding the most appropriate way of dealing with the waste.

The following will not be disposed of to the sewerage system:

- hypodermic needles
- syringes
- instruments
- utensils swabs
- dressings
- bandages paper or plastic items
- any portions of human or animal anatomy
- infectious and solid waste subject to agreement of the regulation Authority

6.5.4 Risk Management of Radiation in Medical Imaging

The radiological facility is required to comply with relevant State legislation, regulations and statutory requirements.

Plans and specifications of the imaging facility will be assessed for radiation protection by a certified physicist or other suitably qualified expert as required by the Australian Radiation and Nuclear Safety Agency. The assessment will specify the type, location and amount of protection required according to the final selection and layout, and this will be incorporated into the building.

During operation of the facility, RANZCR/NATA Standards and Occupational Health and Safety Standards will be in use to monitor staff safety, including

- Use of Lead aprons
- Lead screening
- Badges are worn and regularly monitored.
- Limitation of exposure time

6.6 Built Form

6.6.1 Design Philosophy

In designing the MUPH, a number of competing objectives had to be considered:

- Constraints associated with the layout of the site
- Functional requirements of the hospital
- The visual impact of the height and mass of the structure

The proposed development is wholly contained within the site. Council's relevant site planning and guidelines, in association with the University Research Park Development Standards, have been considered as part of this development.

The overall design of the building:

- Aligns with Technology Place, and Talavera Road, thereby reinforcing the corner element, strengthens the streetscape and becomes an entry statement to the Research Park
- Has facades that are stepped back or articulated to provide a break up of scale, elevational relief and visual interest.
- Has height, scale and bulk which is compatible with the immediate context of the Research Park, and pays due reference to principle of providing an attractive and functional public domain for the use of all.
- Builds on the urban design aims of the Macquarie Research Park Masterplan, ie to "*promote good urban design through the provision of well-articulated buildings that contribute to a lively and aesthetically pleasing environment*".
- Provides public space in a positive way, by providing a colonnade walkway to the two street frontages (namely Technology Place and Talavera Road) which not only meets the requirement of having a setback from the site boundary but also provides a "sheltered" pedestrian walkway for weather protection and a positive connection to Research Park Drive and thence the soon to be completed railway station. It acts as a transitional zone between the private activities inside the building and the public domain located on the other side of Talavera Road.
- Has a level 3 landscaped courtyard to be used in association with the adjacent wards. The upper levels have been designed around the above courtyard, which allows a greater percentage of external wall area, thus providing natural light and views to patient areas.

6.6.2 Construction and Materials

The University Research Park Development Standards require that all new buildings should have characteristics of form scale and finishes compatible with one another and those of the adjacent campus.

To this end it is proposed that the exterior of the building is a combination of concrete, masonry and 9mm fibre cement cladding. The masonry generally forms a two level podium, with a number of small elements such as columns, blades, etc also reaching the first floor. The external stairs also incorporate concrete blades up to the roof. Apart from the fire stairs which are painted a dark charcoal colour, the exposed concrete is finished in a colour and texture resembling sandstone.

The balance of the typical façade is in 9mm FC cladding equal to Hardy DC-2000 system or metal cladding equal to Symonite Aluminium Composite Cladding System.

6.6.3 Landscaping

Taylor Brammer Landscape Architects have prepared a Landscape Plan (**Section 11.8**) and a Landscape Design Statement (**Appendix 7**). This includes landscaping to the Talavera Road frontage and Technology Place. New planting is proposed to address the loss of existing amenity and to create a streetscape that is in keeping with the character and use of the building and its surroundings.

Three existing Canary Island date palms, currently on Site 1 adjacent (**Figure 23**) are to be transplanted into the forecourt of the cafe on the ground level, and will form a positive entry statement to both the proposed development and to the Research Park as a whole.



An example of canary palm from Site 1 adjacent (**Figure 23**)

A coffee shop with both indoor and outdoor seating along the “veranda”, and two retail tenancies, will generate an “active” street frontage facing Technology Drive as required in the Draft DCP 55 for the Macquarie Park Corridor. On level 3, the landscaped courtyard will provide an open space for use by patients and visitors, with a pathway suitable for use in rehabilitation.

6.7 Services

In the design of the facility the following issues have been considered in relation to services.

6.7.1 Air and Noise

Mechanical ventilation and air conditioning systems will be designed by a qualified Consultant Mechanical Engineer and will comply with all relevant Standards and codes of practice. Generally there are no areas in the development where adjoining properties will be affected by air or noise emissions.

The proposed chillers will be air cooled, eliminating any potential for bacterial infections such as Legionella.

Construction noise and hours of operation will be monitored with respect to existing adjacent facilities. Tender requirements will call for management plans to control excessive noise levels.

6.7.2 Drainage

The site already includes a comprehensive drainage system, taking into account overland flows. These provisions have been made in accordance with the Council requirements covering the entire site. B & P (Coast) Pty Ltd were engaged to prepare a hydrological analysis for the site. The report found that the developments on Site 1 and Site 2 will not adversely affect the drainage or flooding situation previously developed during construction of Macquarie University Research Park. There will however need to be some modification to the existing stormwater pipework, to be undertaken prior to the construction of the two buildings on Site 1 and Site 2. (refer **Appendix 6**)

6.7.3 Environmental Systems

The consultants are conscious of the need for ecologically sustainable development and will keep the criteria at the forefront of design principles. Attention has been given to ecologically sensitive materials where feasible, and the design of a building that is efficient in energy consumption for thermal comfort.

The proposed building addition is predominantly of compressed FC with internal insulation to minimise heat absorption and loss. Windows to the north and west will incorporate high performance glass similar to Pilkington SS20 and TS31 to reduce heat gain. Clinical areas will have double glazing with internal Venetians for further heat and glare control in a dust free environment.

Environmental services in the building will incorporate appropriate conservation policies to conserve power and water usage. Internal lighting, except for special lighting requirements will be of energy efficient, long life type. (Refer **Appendix 4**)

6.7.4 Mechanical

Air conditioning is a requirement of modern hospitals, not only for the control of environmental conditions, but for infection control. As a result, a certain amount of redundancy is required beyond the average commercial or residential design. This is unavoidable. However, with the use of sophisticated Building Management Systems (BMS), environmental parameters are monitored and system settings are fine tuned for maximum efficiency and minimum energy use.

The air conditioning and mechanical ventilation systems proposed for Macquarie University Private Hospital would be modelled on the system arrangements successfully applied in the private hospitals at North Shore, Westmead and the Seventh Day Adventist Hospital at Wahroonga.

The air conditioning systems would provide a high level of occupant comfort whilst also incorporating energy efficient system and plant arrangements. The air conditioning systems for the Operating Theatres and sterile spaces would incorporate design features that exceed the nominal requirements of NSW Health Department for these spaces to ensure a higher standard of comfort and cleanliness for the staff and patients.

Design Criteria

The air conditioning and mechanical ventilation systems would be designed in accordance with the requirements of the BCA, Australian Standards and NSW Health Department Engineering Services and Sustainable Development Guidelines TS11. This would include the requirements of AS1668.2 and AS3666. The air conditioning and mechanical plant would be designed not to exceed the recommended noise levels as outlined in AIRAH Design Guidelines, AS2107 and as specified by the acoustic consultant.

Fire Safety

The Fire Safety features of the air conditioning and mechanical ventilation systems would be developed with the fire consultant and architect to form a coherent and effective fire management system.

Main Cooling & Heating Plant

The main cooling plant for each building would utilise a central chilled water system consisting of multiple water cooled chillers, chilled water pumps, cooling towers and condenser water pumps. These systems would incorporate energy efficient measures such as high efficiency chillers, variable speed drive pumps and cooling tower fans. Heating for the building would be provided by a gas fired hot water system utilising high efficiency heating units. These systems would be located in the roof mounted plant rooms.

Air Handling Plant

The air handling systems for the building would be arranged to provide thermal zoning for each of the perimeter areas and interior spaces. Further division for air handling systems would be based on the various different uses of the spaces including independent systems for specialist spaces such as the basement Radio Therapy areas. The air handling plant would incorporate outside air cycles where applicable to reduce energy consumption.

Operating Theatre Systems

Each Operating Theatre would be provided with a separate air handling unit so that close control of the temperature and the humidity can be achieved. Each of the air handling systems would incorporate a high efficiency two stage filtration system including pre filters, main deep bed filters and terminal HEPA filters in the Operating Theatres arranged to provide a near laminar flow environment over the operating table. High supply air temperatures would be used to ensure the comfort of the staff and patients in this environment.

The sterile store and associated areas would also be provided with a high efficiency two stage filtration system. To minimise cross contamination the pressure differential between spaces from high to low would be achieved by the use of all outside air supply systems and the use of multiple variable speed drive exhaust fans for each of the spaces.

Building Management Systems

The air conditioning and ventilation systems and other building services would be monitored and controlled by a direct digital control system. This system would provide full control of the central cooling and heating systems, the air handling systems and ventilation systems. The system would include fault and status monitoring and energy control and monitoring facilities.

Ventilation Systems

The ventilation systems would be in accordance with the ventilation standard AS1668.2. Exhaust systems would be provided for toilet areas, dirty clean up areas, kitchen hoods, recovery areas and other miscellaneous rooms. Supply systems would be provided where required for rooms such as switch rooms, pump rooms and miscellaneous spaces.

Car park Ventilation

The basement car park areas will be provided with supply and exhaust ventilation systems in accordance with AS1668.2.

6.7.5 Construction Management

A construction management plan has been prepared by Baulderstone Hornibrook. (Refer **Appendix 11**) The plan includes suitable construction traffic and site management procedures which will be put in place to minimize the impacts of construction on neighbouring buildings and the surrounding street network.

6.7.6 Maintenance

During the construction period, the Site Manager will be responsible for maintenance of the site (refer **Appendix 11**). During this period the public domain surrounding the site will be cleaned on a regular basis.

After occupation, ongoing maintenance will be undertaken by MURP.