M+G Consulting

Northside Private Hospital Gosford

Structural Engineering DA Report

For
AA Crown Holdings Pty Ltd

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Project No:	**5056**

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REPORT STATUS						
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INTRODUCTION

M+G Consulting has been engaged by Donald Cants Watts Corke (DCWC), on behalf of the developer AA Crown Holdings, to assist in preparation of the Development Application for the proposed Northside Private Hospital project. As part of this process, we have reviewed various documentation and drawings, liaised with the architect and provided structural engineering advice with the view to develop the documentation and achieve the sufficient level of comfort in regard to the structural feasibility of the proposed development. This report summarises this process with the aim to demonstrate the viability of the proposed development from the structural perspective.

RELEVANT DOCUMENTATION

As part of the process we have reviewed the following documentation and reports:

- Architectural drawings by Health Projects International (Project Northside Private Hospital).
- Preliminary geotechnical investigation report by Douglas Partners (Reference 83574.00 dated March 2019).

COMMENTS AND ANALYSIS

The proposed development consists of the following:

Stage 1 Works:

- A 9-storey hospital building with hospital wards, medial tenancies and operating theatres.
- 3-level of basement parking and associated back-of-house facilities.

The ground floor of the hospital building is to be designed to contain a possible future emergency department.

Future Stage 2 Works include:

- Additional parking in the Basement B1 and B2 levels.
- New 4-storey medical tenancy building.

The development may also include possible further stages of expansion, involving a future clinical building over the ground floor podium slab and an extension of the wards between Level 5 and the roof.

The general configuration of the development is shown in Figures 1, 2 and 3.

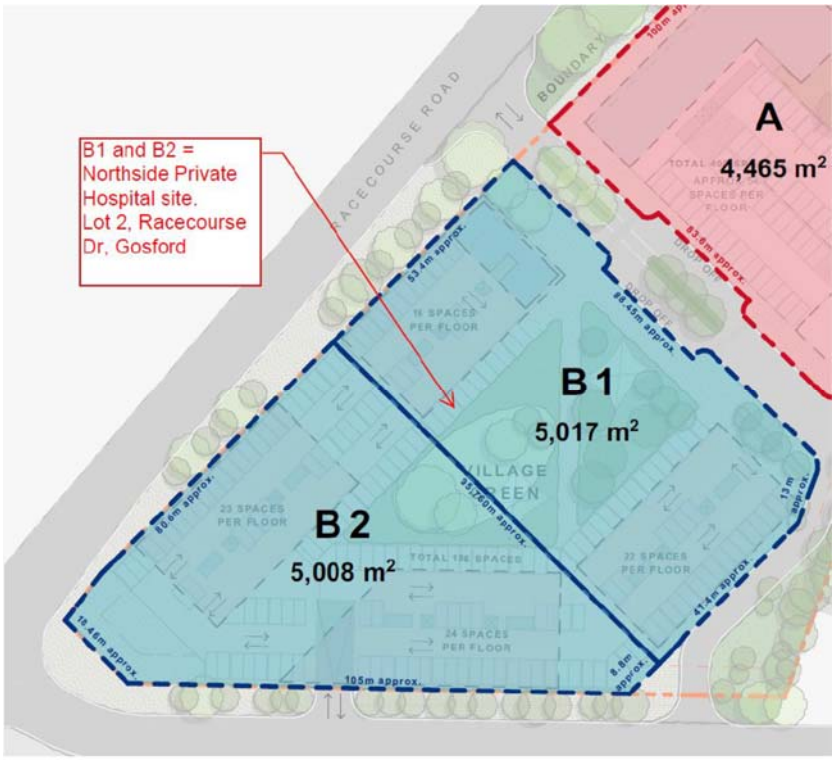

Figure 1: Development Site

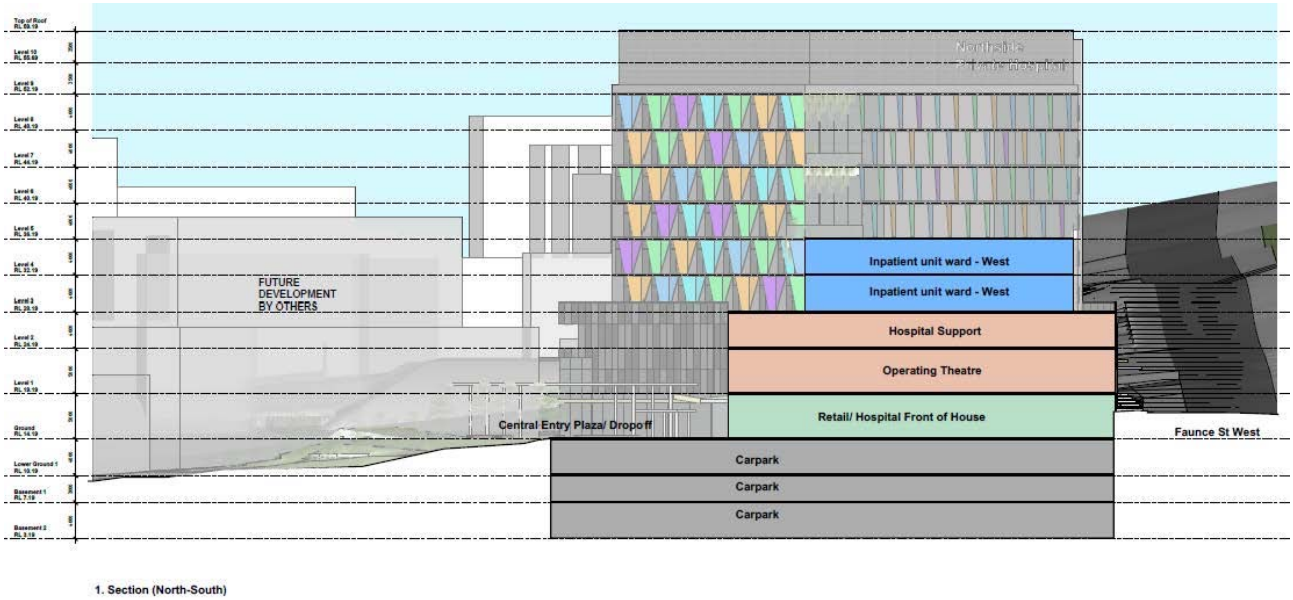

Figure 2: Building Section Stage 1 Development

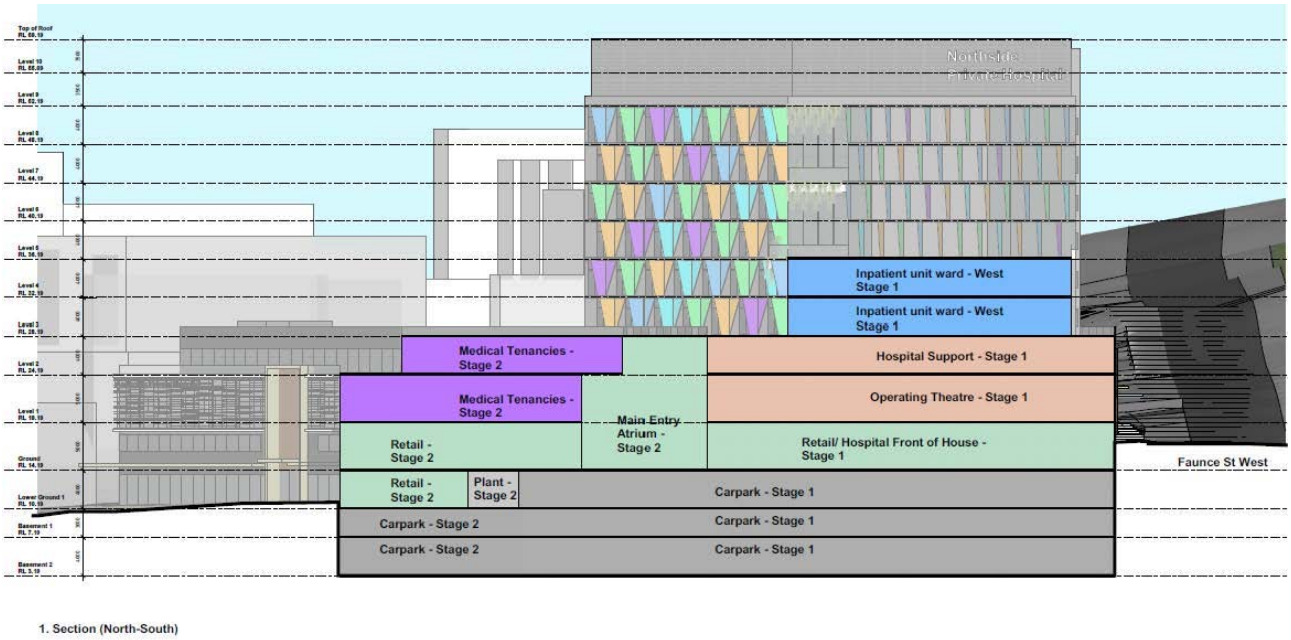

Figure 3: Building Section Stage 2 Development

Site Conditions

The development site is bounded by Racecourse Road and Faunce Street West, North Gosford. The nearby surrounding areas contain large open spaces consisting of Gosford Golf Club (north of the site), Gosford Racecourse (west of the site) and dense bushland (east of the site). The site is near the Brisbane Water. The site will therefore have limited shielding from winds in most directions.

Based on the information contained in the preliminary geotechnical investigation report, the site strata consists of fill and silty clay layers over sandstone/siltstone bedrock. The strength of the bedrock increases with depth. It is expected that the building will be founded on sandstone/siltstone. The strength of the founding material will need to be confirmed with a more detailed geotechnical site investigation, which we understand will be undertaken prior to the commencement of the future detailed design stage.

This more detailed investigation will also need to investigate any ground water issues and provide recommendations regarding basement walls and slab construction and methods for disposal of ground water (if encountered), including any potential effects of long-term dewatering on surrounding areas.

The advice from the civil engineer on the project has confirmed that the site is not in a flood prone area.

Structural Framing

Since it is possible that an emergency department may be incorporated into the hospital at a future date, the hospital will need to have a post-disaster function and will be designed to satisfy Importance Level 4 design requirements for wind and earthquake design actions.

The proposed architectural layout of the hospital contains several lift and stair cores located over the building footprint. The individual floor slabs will be designed as diaphragms to connect these cores. The cores will be used to provide the required lateral stability and to resist the lateral loads acting on the building resulting from wind and earthquakes.

The column layout of the hospital building is generally uniform and column alignment occurs at most of the floors. No difficulties with structural design are anticipated based on the proposed floor-to-floor heights (generally 4.0m). It is envisaged that the floor slabs will be post-tensioned concrete supported by concrete columns and walls.

Some localised areas of column transfers are likely to remain.

The areas of floors directly the operating theatres are situated, as well as those over operating theatres, or those supporting sensitive medical equipment, will be designed to ensure that floor vibrations will be within acceptable limits.

At the ground level and below, the building footprint widens considerably compared to the typical hospital floors. Again, no difficulties with the design of these floors are anticipated based on the proposed floor-to-floor heights. It is envisaged that the floor slabs will be post-tensioned concrete structures supported by concrete columns and walls.

The structure will be designed to accommodate the proposed future building extensions. In this regard, structural walls, columns and foundations will need to account for the increased loading from the proposed futures stages of expansion.

Furthermore, the Lower Ground, Ground and Level 5 slabs will need to be designed to support the weight of the proposed future floors extensions without the need for any back-propping. This will avoid disruptions in the operation of the hospital.

Excavation and Foundations

It is expected that a combination of shoring and temporary batters will be required for the basement excavation. The shoring will require the installation of temporary rock anchors to retain the soil. The lengths of these rock anchors may extend past the site boundaries. If this is the case, permission from the adjoining property owners will be required to allow the anchors to installed beneath their properties prior to their installation. In the permanent

condition, the temporary anchors will be decommissioned, and the shoring will be restrained by the basement and ground floor slabs.

The shoring method to be adopted will be dependant on the findings of the future detailed geotechnical and hydrogeological investigation and recommendations contained in the relevant report, when available.

At the base of the basement excavation, it is envisaged that sandstone/siltstone will be encountered. It is expected that the building foundations will consist of pad and strip footings. Footings will be sized to account for increased building loads resulting from possible future hospital expansion planned for future stages.

CONCLUSION

It is our opinion that the proposed development, comprising of a 9 floors hospital building and 3-floors of basement, is feasible from the structural perspective. The adopted layouts and configuration of the buildings are in harmony with efficient structural design practice and will provide a platform for an efficient and affordable project in terms of structural design.