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STRUCTURAL ENGINEERING- REF REPORT

HI24270 – Mount Druitt Hospital – Additional Beds Hospital

Prepared for: Health Infrastructure

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Revisions

Revision	Description	Date	Prepared by	Approved by	Signature
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2	Issue for REF	24/10/25	JY	BM	DL
3	Issue for REF	27/10/25	JY	BM	DL

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1 Introduction

NSW Health Infrastructure (HI) proposes to provide 30 additional beds at Mount Druitt Hospital at 75 Railway Street, Mount Druitt as part of their delivery of infrastructure solutions and services to support the healthcare needs of the NSW communities.

To facilitate the provision of the additional beds the following works are proposed:

- Extension of the existing main hospital building across two levels at its southern-most extent:
 - Level 1 – extension to existing building
 - Relocation and Expansion of Outpatient Department (OPD) accommodating 23 separate rooms or points of care as well as ancillary rooms and spaces of about 833m².
 - New enclosed lobby of about 75m².
 - Future expansion zone (assumed as cold shell for future clinical or non-clinical purposes) of about 235m².
 - Level 2 – extension to existing building
 - New 20 bed with ensuite in-patient unit (IPU) and support spaces of about 1,085m² in area with external fire / access stairs to Level 1 / ground.
 - The 20 beds are set out in a 10 x 1-bedroom; 3 x 2-bedroom; and 1 x 4-bedroom configuration.

The works will also involve the following ancillary or supplementary works:

- Selected tree removal to accommodate the proposed development and its ancillary works, as further set out below.
- Demolition of the existing decommissioned helipad and make-good works.
- Civil and flood mitigation works to manage overland flow paths in the vicinity of the proposed extension and car park.
- Extension of the existing at-grade car park P1.
- New oxygen compound adjacent to the existing oxygen compound.
- Augmentation of the existing fire hydrant ring main adjacent to the western edge of the main hospital building and relocation and partial upgrade of the existing hydrant booster.
- Offset planting and new landscaping.

1.1 Site Context

The subject site (Lot 11 in DP 1268736) is bounded by Luxford Road to the north-west, commercial precincts to the west, educational facilities to the south, and Railway Street and fire station to the north-east.

The site has a total area of approximately 12.83 ha; however, the proposed development is mainly within the east of the existing building and the surrounding area.

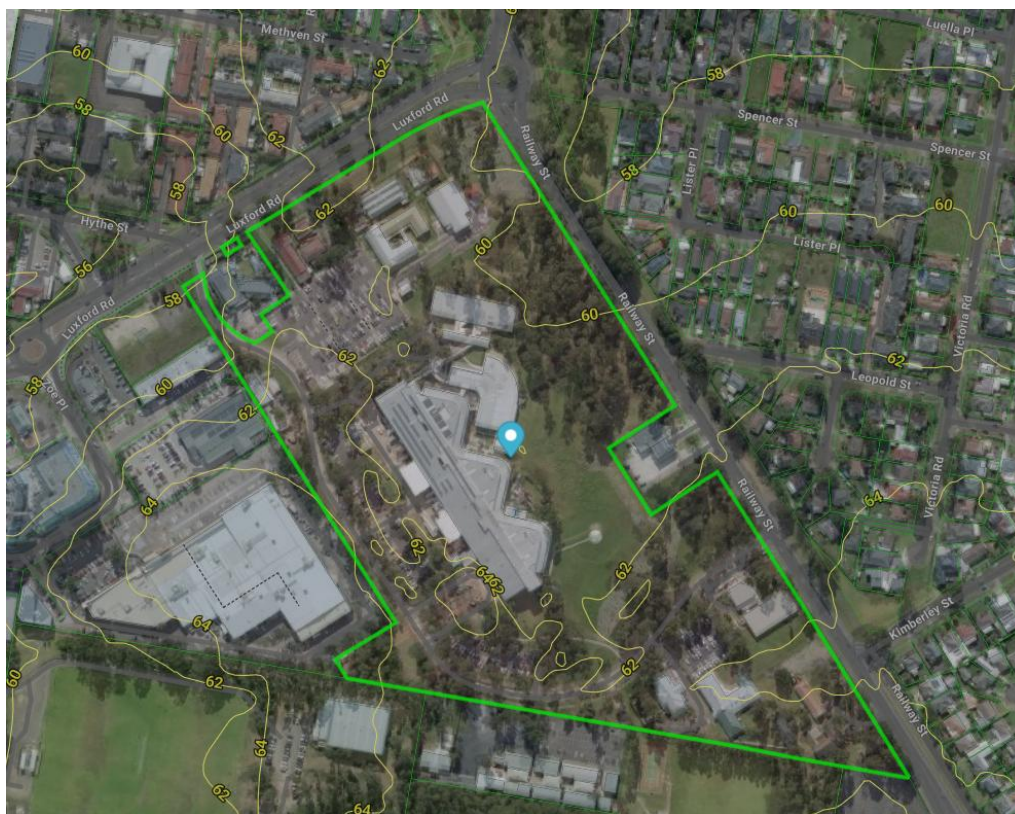


Figure 1 Site Aerial and Site Topography (Source: Nearmaps)

The existing hospital building was commissioned circa 1983 and has undergone two extensions, the latest of which we understand to have been the Stage 1 Urgent Care works undertaken in 2013.

The proposed two-storey new extension is located on the right wings of the existing hospital building.



Figure 2 Proposed location of the new extension (Source: Sixmap)

1.2 Site Survey

A detailed topographical survey and inground service location survey of the existing site has been completed on 17/07/2025 by RPS AAP Consulting Pty Ltd. This survey has been used to determine the existing topography and site features that will be impacted due to the site development.

The details of this survey are listed below:

Surveyor Contact Details:	RPS AAP Consulting Pty Ltd Level 13 420 George Street Sydney NSW 2000 Tel: 02 8270 8300
Job Reference:	SYD393209
Survey Date:	17/07/2025
Drawing Number:	SYD393209-DT-001 SYD393209-UT-001

1.3 Geotechnical Investigation and Site Geology

HI have commissioned JK Geotechnics to undertake detailed site investigations of geotechnical, groundwater, soil contamination and hazardous materials on the project site.

The details of this report are listed below;

Name: Proposed Mount Druitt Hospital Additional Beds Project

Contact Details: JK Geotechnics Pty Ltd
115 Wicks Rd, Macquarie Park Tel: (02) 9888 5000

Job Reference: 37665LFrpt2

Report Date: 24/10/2025

The boreholes disclosed a generalised subsurface profile comprising shallow to moderately deep fill overlying residual clays, with weathered siltstone bedrock at depth. The weathered siltstone bedrock was encountered in all boreholes at depths ranging from 3.8m to 4.5m below existing surface levels. This will result in limited bearing pressures. Better quality bedrock is expected to be present at a greater depth subjected to further investigation.

Table 1 – Geotechnical Design Parameter by JK Geotechnics

Rock Unit (Class)	Allowable End Bearing Pressure (kPa)	Allowable Shaft Friction (kPa) Compression	Ultimate End Bearing Pressure (kPa)	Ultimate Shaft Friction (kPa) Compression	Elastic Modulus (MPa)
Very Low to Low Strength Bedrock	1,000	100	3,000	100	200

Indicative borehole locations are shown on the plan below.

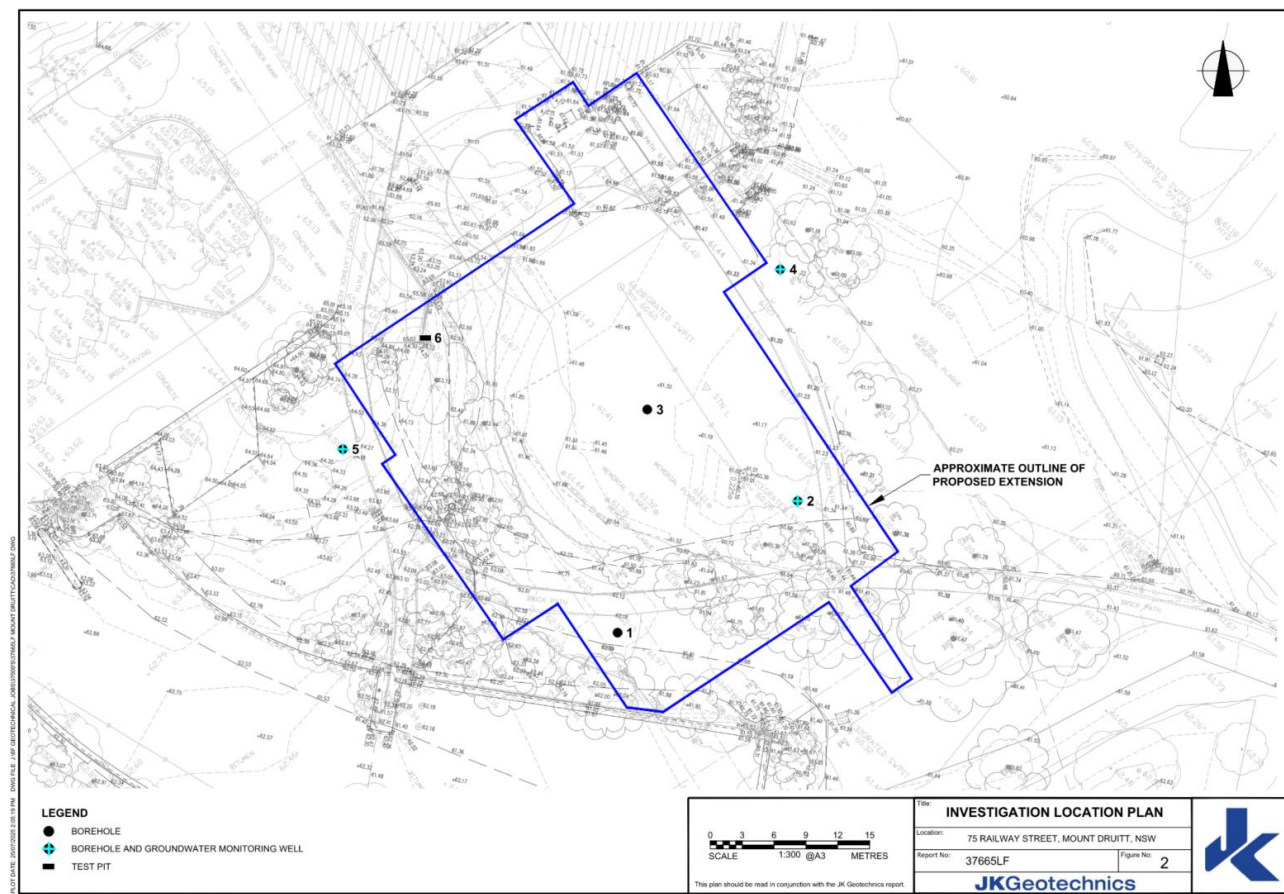


Figure 3 Bored hole locations by JK Geotechnics

1.4 Structural System for the New Build

The proposed new building will follow a standardised 8.4m grid in accordance with Health Infrastructures Design Guidelines. The vertical structural components are concrete columns and concrete shear walls. The suspended structure will be constructed with a post-tensioned flat floor plate. The foundations of the new building are anticipated to consist of suspended foundation raft slab, supported by reinforced concrete piles bearing on the underlying high strength bedrock. The roof structures are steel-framed structures with façade truss on the Northern side. The external façade system is proposed to be constructed from a combination of masonry veneer and lightweight cladding. Fire separation between the new building and the existing will be provided by a reinforced concrete wall or a similar construction type.

The proposed building location and external plant room locations will require the construction of a new retaining wall to the West of the building, adjacent to the emergency department drop-off.

1.5 Excavation

The lowest level of the proposed project will be founded at the natural grade with no major excavations excavation for basements or shoring proposed for the project.

Based on the geotechnical investigations, we understand that the natural soils will be readily excavated using standard earth-moving equipment. Temporary batters for excavation purposes are advised as being a minimum of 1H to 1V.

Excavation and regrading of the surface levels around the development footprint are detailed in the Civil report and in the pre/post-development flood study prepared by Northrop. Further details can be found within these reports.

1.6 Bulk Oxygen Storage

The proposed bulk oxygen storage compound is to be located to the west of the main hospital building. The construction of this new storage compound will require excavation into the existing embankment, and the construction of a new concrete slab on ground, with reinforced and core-filled block walls to 3 sides of the compound acting as both retaining walls and fire separation walls.

1.7 Disruption and Staging

Noise/dust/vibration issues have been identified as a construction risk. It is intended that the staging of works and isolation of disruptive activities will be coordinated with the hospital to control these risks. The New Build Works are to be constructed in a way that minimise the potential disruption to the hospital operations.

Existing services that may be impacted by the building works are to be diverted and relocated into a common services trench.

Construction traffic can disrupt hospital operations. The provision of construction access to the site will need to be carefully considered by the contractor.

2 Design Parameters

2.1 Design Standards

The following list indicates the relevant design guides and standards to be considered through the Structural Engineering design:

- DGN 001 - Structural Design Criteria Guidelines
- DGN 006 - General Design Principles
- DGN 024 - Building Importance Levels for NSW Health Projects
- DGN 030 - Site Investigations
- DGN 058 - Environmentally Sustainable Development
- AS/NZS 1170.0 - Structural Design Actions
- AS/NZS 1170.1 - Structural Design Actions – Permanent, Imposed and Other Action
- AS 1170.2 - Structural Design Actions – Wind Loading
- AS 1170.4 - Structural Design Actions – Earthquake actions in Australia
- AS 3600 – Concrete Structures
- AS 3700 – Masonry Structures
- AS 4100 – Steel Structures
- AS 4600 - Cold-formed Steel Structures
- AS 4678 - Earth-retaining Structures

2.2 Design Loadings

2.2.1 Floor Loads

Table 2 – Floor Loads

Floor Type	Uniform Imposed Load (kPa)	Imposed Point Load (kN)	Ceilings, Services Load, Partitions, Floor Finished (kPa)	40mm Sacrificial Concrete Toppings
Stairs, ramps	4.0	4.5	0.0	0.0
Corridors, circulation areas and foyer spaces	5.0	4.5	1.3	1.0
Wards typically	2.0	1.8	1.8	1.0
Clinical areas	3.0	4.5	1.8	1.0
Plant rooms	7.5	4.5	2.4	0.0
Roof typically	0.25	1.4	1.0	0.0
Shell space future expansion	4.0	4.5	3.0	0.0

2.2.2 Wind Load Parameters

Table 3 – Wind Load Parameters

Item	Value
Location	Region A3
Importance Level	4
Vu	48m/s
Vs	37m/s
Ms	1.0
Mt	1.0
Md	1.0
Terrain Category	2.5 – 3.0

2.2.3 Earthquake Load Parameters

Table 4 – Earthquake Load Parameters

Item	Value
Importance Level	4
Probability Factor, Kp	1.5
Hazard Factor, Z	0.08
Sub-Soil Class	Ce
Earthquake Design Category	II
Structural Ductility Factor, μ	1*
Structural Performance Factor, Sp	0.77