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CIVIL AND STRUCTURAL ENGINEERING

Tender Issue

HI22291 SWMHIP – Concord Hospital

Prepared for: Health Infrastructure NSW

Document no: ACR-CIVSTR-RPT-005

Issue no: Rev B

Confidential & Commercial in Confidence

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Revisions

Revision	Description	Date	Prepared by	Approved by	Signature
F	Tender Issue	09.10.2023	Z. Pitt	T. Bosman	

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Appendices

1 Executive Summary

ACOR Consultants Pty Ltd, in the capacity of the project Civil and Structural Engineering Consultants for tender issue, has reviewed and analysed the environmental and functional requirements as well as performance standards to be met by the civil and structural design elements for the new Concord Hospital Forensic Mental Health Unit.

Concord Hospital is located on Hospital Road, Concord, within the Canada Bay LGA. The site is bounded by Nullawarra Avenue to the west and Yaralla Bay to the south and east. The new Forensic Unit will be located within the Concord Centre for Mental Health, in between building 28 and building 109 & 110. The site is approximately 0.4 ha, of which the main building occupies approximately half of the area and is located to the east of the site. A new driveway and road are to be built to the north and east portion of the site.

There is an existing building and car park in the middle of the site. These are to be demolished in order to build the new mental health unit and road.

1.1 Civil Engineering

The main entrance to the site is located through the existing internal road to the north of the site with a driveway access provided at the west of the site, which will be shared by logistics, ambulances, and the general public. The driveway grades down to the south and crosses an existing footpath. The surrounding existing hospital roads are also required to remain operational during the construction of the new buildings.

The Concord Hospital site has not been identified to be within a Flood Planning Area as assessed by the Canada Bay LGA and as such is considered not to be flood effected.

The new forensic health building is intended to be drained via a conventional roof drainage system connecting to a new inground pit and pipe network which is to discharge into the existing Council drainage system. The onsite in-ground drainage will be sized for the 20-year ARI storm event with overland flow paths designed to convey flows up to 100-year ARI storm event.

Under the Canada Bay DCP Engineering Specifications, the site has an exemption from providing on-site detention. The new development will discharge to the existing stormwater system which discharges directly to Parramatta River which is tide affected.

Stormwater discharging from the site at each of the discharge point will include Water Sensitive Urban Drainage (WSUD) measures, with a treatment train consisting of a gross pollutant trap (GPT) plus a proprietary tertiary treatment filter device. The treatment train at each discharge point will be designed to meet the stormwater quality targets outlined in the DCP. More stringent requirements may need to be considered to address the ESD goals for the project.

1.2 Structural Engineering

Column and core foundations will be piled to the underlying weathered rock (shale), with pile caps provided as required. To minimise excavation into contaminated fill, the ground floor slab will be designed as a suspended slab on ground supported by CFA piers to shale.

For tender issue we have adopted a PT slab as an economic form of construction as part of the whole of life analysis. A structural grid which does not exceed approximately 8m has been adopted to allow an efficient flat slab system to be utilised. In situ concrete or precast stair and lift cores have also been adopted.

The roof structure is to be of lightweight construction. The roof support is designed to correspond with the typical Type A grid arrangement to enable flexibility. An alternative cost-effective solution is to utilise light gauge steel trusses supported on steel stud load bearing walls should flexibility not be necessary.

2 Introduction

2.1 Project Scope

Concord Repatriation General Hospital (hereafter referred to as Concord Hospital) is a major hospital in Sydney, located within the Canada Bay Local Government Area (LGA).

In the 2018-19 NSW budget the NSW Government announced a $700m funding commitment to develop a State-wide Mental Health Infrastructure Program. The project announcement includes a new 42 bed Forensic Unit at Concord Hospital.

ACOR Consultants have been engaged by Health Infrastructure NSW as the Structural and Civil engineering consultants. This report has been prepared to outline the existing site conditions and the Civil and Structural engineering requirements applicable for the schematic design of the project.

The report will focus solely on the new Forensic Unit at Concord Hospital. Opportunities and constraints for this project have been reviewed and outlined with respect to the civil and structural engineering scope. Key design requirements and risks have also been highlighted for consideration.

3 Existing Site Conditions

3.1 Existing Site Overview

Concord Hospital is located on Hospital Road, Concord, within the Canada Bay LGA. The site is bounded by Nullawarra Avenue to the west and Yaralla Bay to the south and east. The new Forensic Unit will be located within the Concord Centre for Mental Health, in between building 28 and building 109 & 110. An existing site plan is provided in Figure 2.1 below, with the new development area highlighted in red.

The site is currently occupied by a 1 storey fibro and brick building (building 29) and an on-ground car park. The site slopes down to the south where it meets Yaralla Bay.

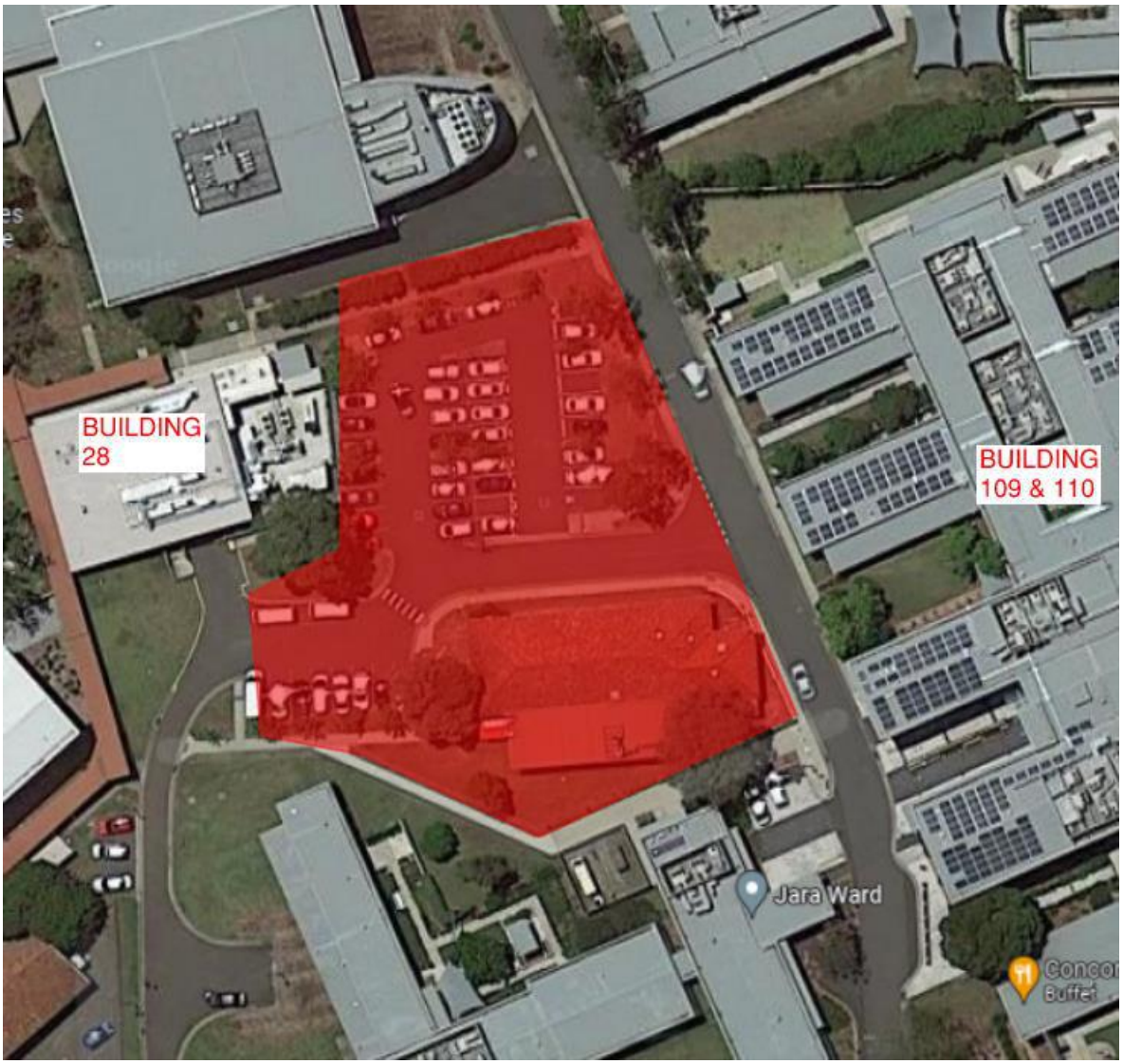


Figure 2.1 - Existing site plan (Source: Google Maps).

3.2 Geotechnical Investigation & Site Geology

A site-specific investigation was carried out by EI Australia Pty Ltd in August 2023 – report ref no E25996.G03. A copy of this report is provided in Appendix D. A plan view highlighting the location of boreholes is shown below in figure 2.2.

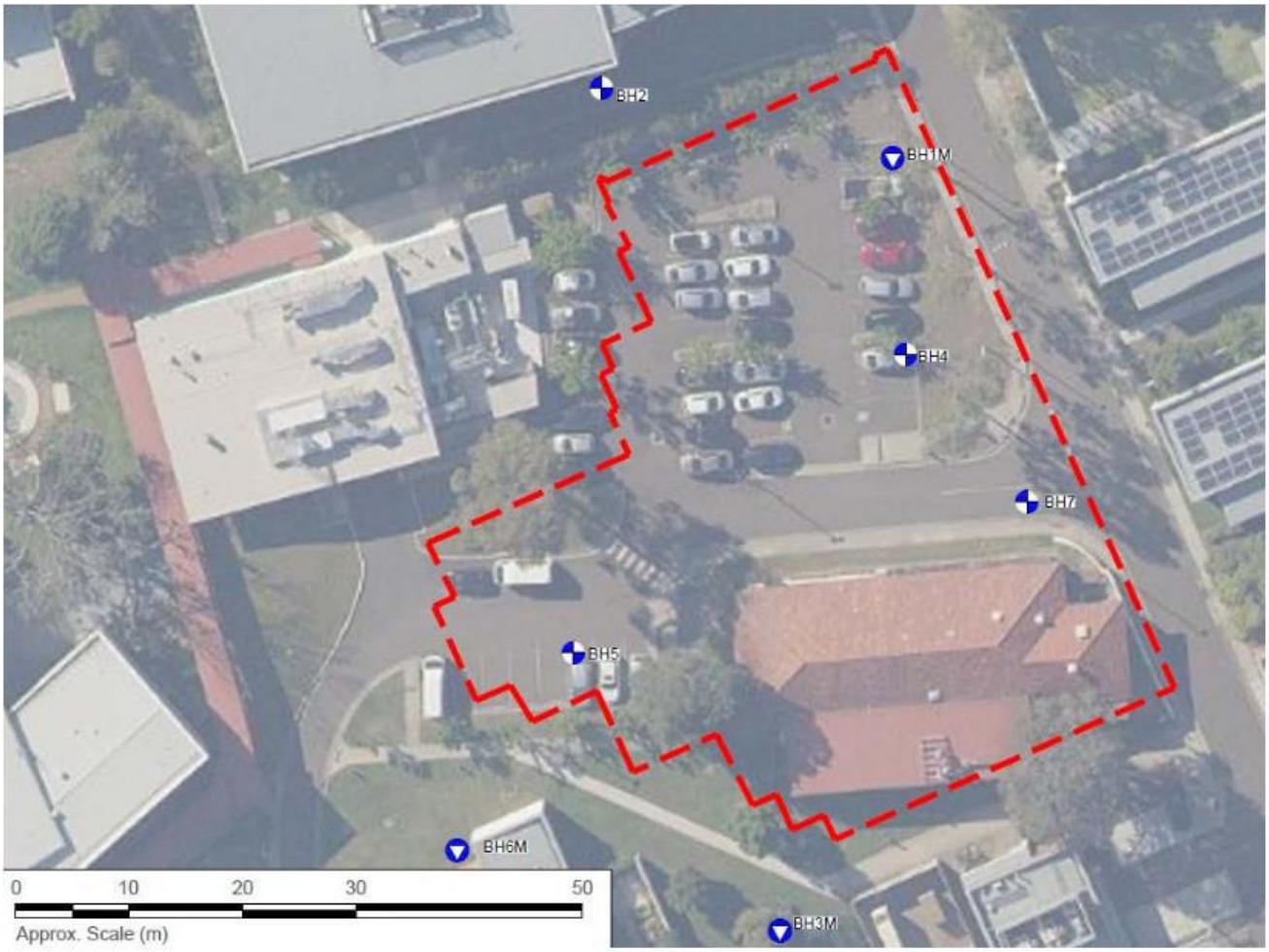


Figure 2.2: Coffey Bore Hole Locations

Results from all the borehole tests indicate that weathered sandstone is at depth varying between 1.5-2.5m. This rock is overlaid by fill and clay. Two of the borehole results are shown in figures 2.3 and 2,4 respectively. All remaining results of the borehole tests are shown in the Geotech report in appendix D.

eiaustralia

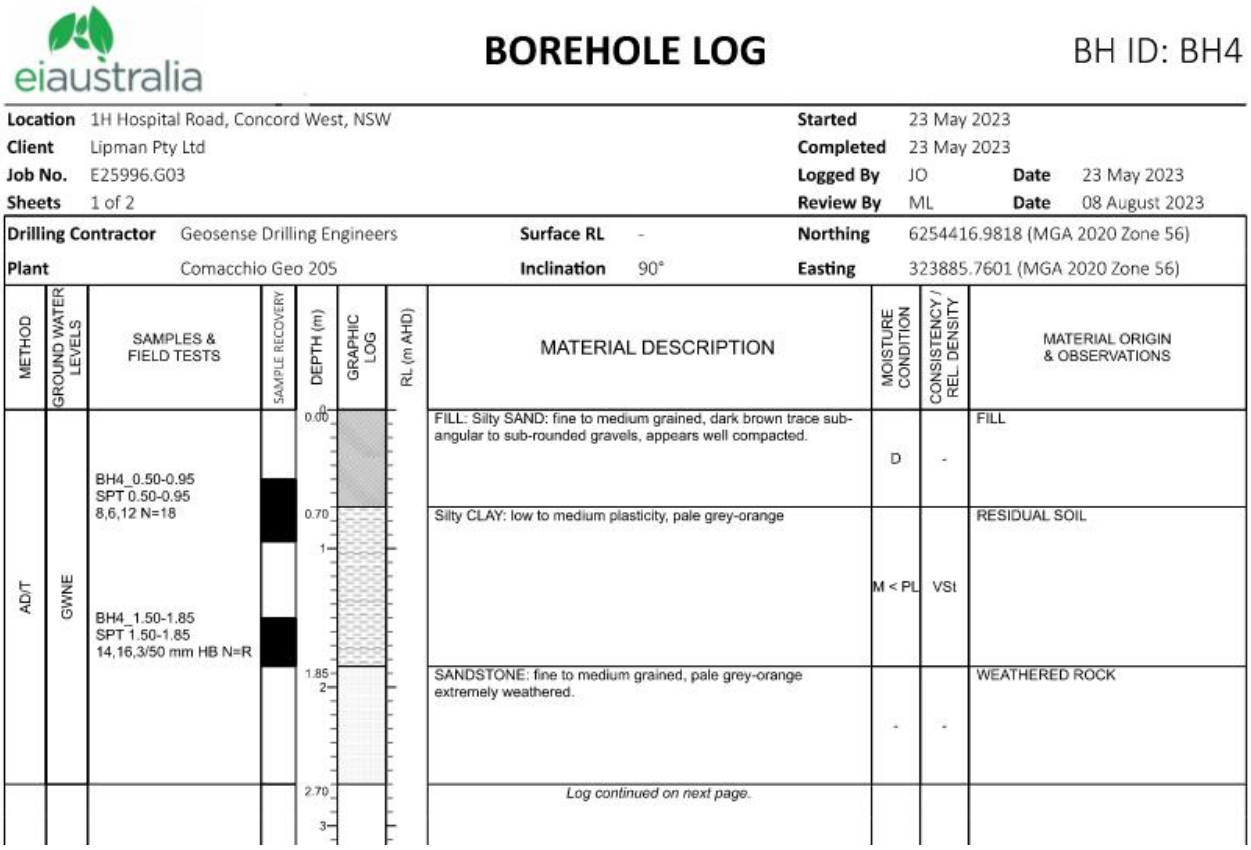
BOREHOLE LOG

BH ID: BH1M

Location	1H Hospital Road, Concord West, NSW			**Started**	24 May 2023
Client	Lipman Pty Ltd			**Completed**	24 May 2023
Job No.	E25996.G03			**Logged By**	JO **Date** 24 May 2023
Sheets	1 of 2			**Review By**	ML **Date** 08 August 2023
Drilling Contractor	Geosense Drilling Engineers	**Surface RL**	-	**Northing**	6254460.6730 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	323863.8164 (MGA 2020 Zone 56)

METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	SAMPLE RECOVERY	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / REL. DENSITY	MATERIAL ORIGIN & OBSERVATIONS
AD/T	7/25/2023 7:10:00 AM			0.00			ASPHALT: 100mm thick	-	-	ASPHALT
				0.10			FILL: Silty SAND: fine to medium grained, dark brown with sub-angular to sub-rounded gravels, appears well compacted.	D	-	FILL
		BH1M_0.50-0.95 SPT 0.50-0.95 8,15,30 N=45		0.60			Silty CLAY: low to medium plasticity, pale grey-orange	M < PL	H	RESIDUAL SOIL
		BH1M_1.50-1.65 SPT 1.50-1.65 18/150 mm HB N=R		1.65			SANDSTONE: fine to medium grained, pale grey-orange, extremely weathered.	-	-	WEATHERED ROCK
				3.00			*Log continued on next page.*			

Figure 2.3: Borehole BH1M



BOREHOLE LOG BH ID: BH4

Location	1H Hospital Road, Concord West, NSW	**Started**	23 May 2023
Client	Lipman Pty Ltd	**Completed**	23 May 2023
Job No.	E25996.G03	**Logged By**	JO **Date** 23 May 2023
Sheets	1 of 2	**Review By**	ML **Date** 08 August 2023
Drilling Contractor	Geosense Drilling Engineers	**Surface RL**	- **Northing** 6254416.9818 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90° **Easting** 323885.7601 (MGA 2020 Zone 56)

METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	SAMPLE RECOVERY	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / REL. DENSITY	MATERIAL ORIGIN & OBSERVATIONS
AD/T	GWNE	BH4_0.50-0.95 SPT 0.50-0.95 8,6,12 N=18		0.00			FILL: Silty SAND: fine to medium grained, dark brown trace sub-angular to sub-rounded gravels, appears well compacted.	D	-	FILL
				0.70			Silty CLAY: low to medium plasticity, pale grey-orange	M < PL	VSt	RESIDUAL SOIL
		BH4_1.50-1.85 SPT 1.50-1.85 14,16,3/50 mm HB N=R		1.85			SANDSTONE: fine to medium grained, pale grey-orange extremely weathered.	-	-	WEATHERED ROCK
				2.70			*Log continued on next page.*			

Figure 2.4: Borehole BH4M

3.3 Site Survey, Grading and Topography

A detailed topographical site survey and inground services survey has been undertaken by LTS. This has been used to inform the schematic design. Refer to Appendix A for site survey.

Name:	Concord Hospital
Contact Details:	LTS Tenancy 2, Level 6/205 Pacific Hwy, St Leonards NSW 2065
Job Reference:	33907 020DT
Date of Survey:	15/08/2022

The Campus is located on a peninsular in the Parramatta River with Yallah Bay to the Southeast. The campus is highly developed with buildings ranging in ages and construction form. The location for the Forensic Unit is in the centre of the campus within the mental health precinct. The site slopes to the southeast and is near the foreshore nature reserve. The site location is greater than 40m from the Mean High Water line.

3.4 Existing Stormwater Drainage

The site's current inground stormwater system connects to the Campus network. There are two main drainage lines to the North and South of the site. These pipes discharge into Yaralla Bay via headwalls as shown in figures 2.6 and 2.7.

Figure 2.6: Headwall into Yaralla Bay

Figure 2.7: Discharge Pipe into Yaralla Bay

A layout of the existing stormwater system is shown below in figure 2.8. This is based off site observations and should be confirmed with existing stormwater drawings.

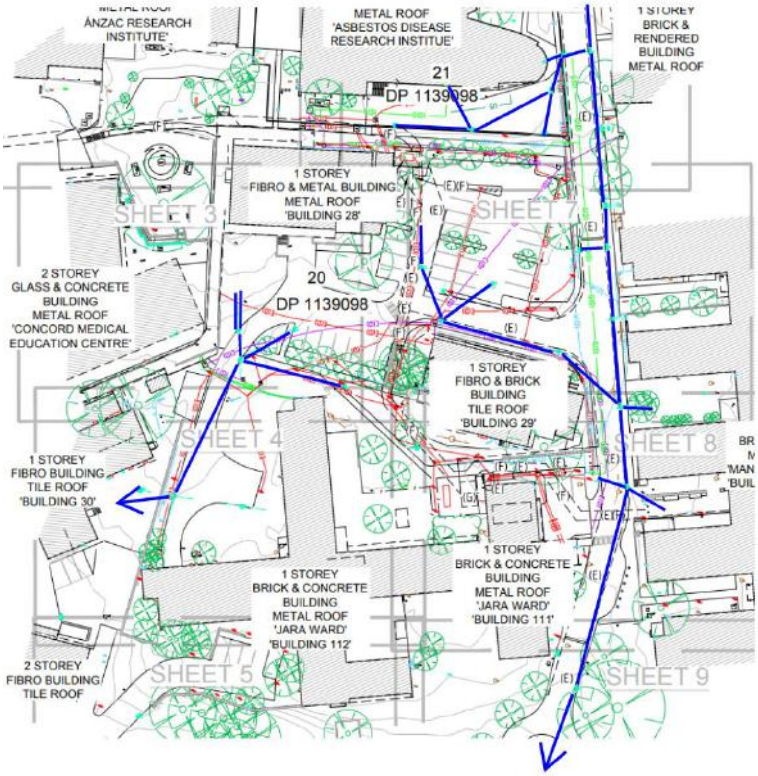


Figure 2.8 – Existing Stormwater System

3.5 Existing Easements and Constraints

The LTS survey drawing indicates that the site is burdened by a number of easements. In particular there is an easement for access placed over the existing roads within the site. The easements for access have been highlighted in figure 2.9, and the easements for electrical inground infrastructure have been highlighted in figure 2.10 below.

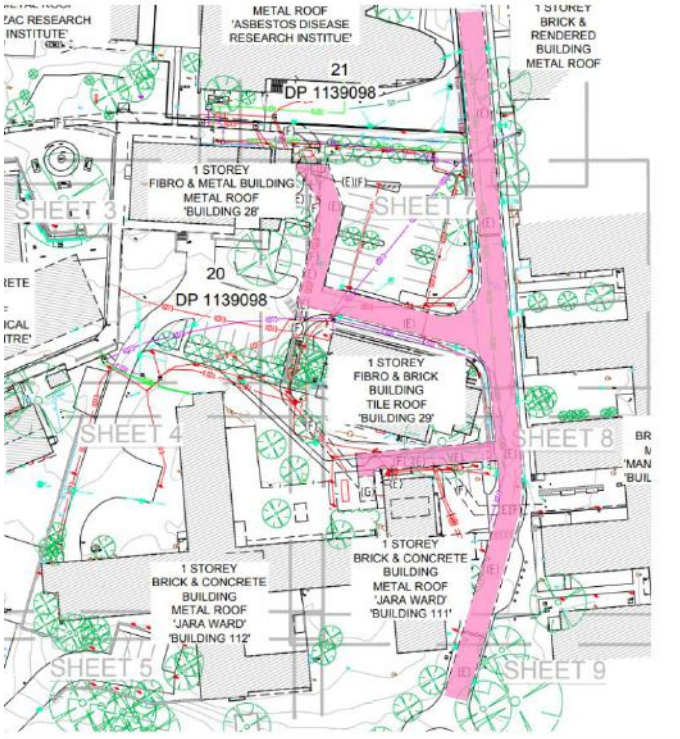


Figure 2.9: Easements for Access, LTS Survey

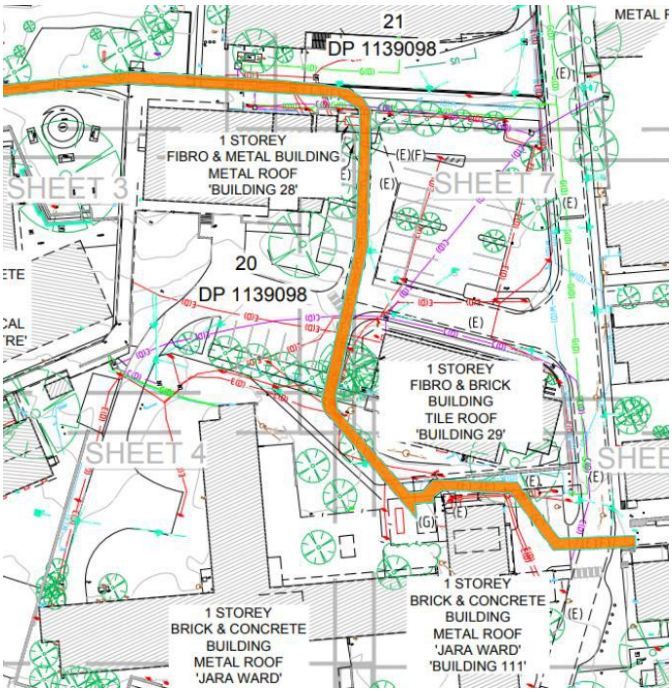


Figure 2.10: Easements for Electrical Inground Infrastructure, LTS Survey

3.6 Soil Contamination

Soil samples from site were collected and tested in the lab as part of the Geotech investigation by EI Australia. The results from these tests indicate that no contaminants of concern were reported at concentrations above the adopted health-based criteria. Asbestos was also not detected in any of the fill samples collected from each of the investigated locations.

3.7 Acid Sulphate Soils

The 1:25,000 Prospect/Parramatta River Acid Sulfate Soil (ASS) Risk Map indicates that there is no know occurrence of acid sulfate soil where the site is to be located, as per figure 2.11 below.

Figure 2.11: Acid Sulfate Map

3.8 Existing Site Access

Access to the site is through Gate 3 and Helipad Road, with some possible secondary access via the internal hospital roads. The intersection and internal road performance will need to be confirmed with the traffic consultant particularly how construction vehicles are to be manoeuvred and materials delivered and stored.

3.9 In ground Infrastructure

The site is surrounded and traversed by infrastructure which services the Campus, as outlined in the LTS survey. These items will need to be protected or relocated. In particular, the site is crossed by Ausgrid HV and LV cables linking substations 2 and 3. There is also campus water and medical gas which are within the site.

3.10 Functionality of the Existing Facilities

Building 28 is to be retained and the design will need to preserve access to the existing loading dock during construction and in the final design.

3.11 Top Risks

1. Inground services crossing site: Major services cross the site (HV/LV in particular). There is a risk to the program and approvals if a strategy to divert or protect is not developed.
2. Construction vibrations cause damage to existing buildings: From our experience in the location area, we are aware that the excavation into rock can cause damage to the existing buildings. If this is not considered in the design, there is a risk of unexpected costs and delays during construction. Vibration monitoring and mitigation is recommending during construction to limit vibration to building 28. To be confirmed by geotechnical engineer.
3. New services clash with existing: If the existing services are not identified and co-ordinated with new services and new diversion such as HV lines and gravity services, major delays could arise.
4. Existing foundations and inground structure: There have been significant structures occupying the site in the past (including a current building that is to be demolished). There is a risk that the substructures remain buried causing cost over runs.
5. Unexpected contamination encountered: Unexpected contamination can cause cost over runs and delays. No contaminates were found in the samples tests by EI Australia, however there is a possibility that contaminates may be buried on other locations on site.

4 Development Design and Requirements

4.1 Development Overview

The development is intended to sit on the western side of the existing access road. This will help to enable the continued operation of the surrounding buildings during the construction of the new Forensic Unit building. At the completion of the works, new vehicle access and pedestrian access will be available surrounding the Forensic Unit building. The new Forensic Unit development site plan is shown below in Figure 3.1 below.

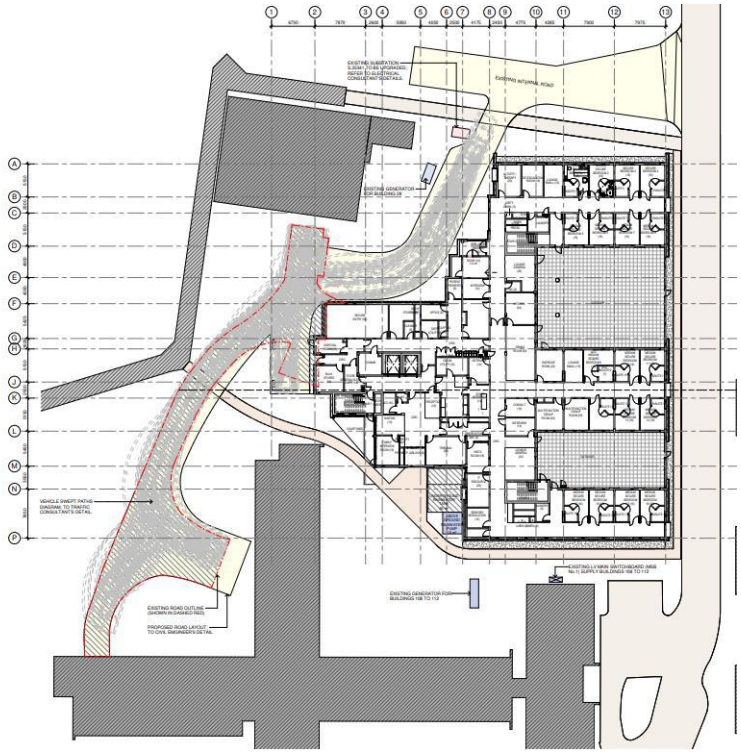


Figure 3.1 – Site Plan Prepared by NBRS Architecture

4.2 Civil Engineering

4.2.1 Design standards

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

- Austroads: Guide to Road Design
- Austroads: Guide to Pavement Technology
- Austroads: Guide to Traffic Engineering Practice Parts 1 – 14
- Austroads: Guide to the Geometric Design of Urban Roads
- AS1428.1 Design for Access & Mobility
- AS2890.1 Parking Facilities: Off–street car parking
- AS2890.2 Parking Facilities: Off-street commercial parking
- AS2890.5 Parking Facilities: On-street parking
- AS2890.6 Parking Facilities: Off-street for people with disabilities
- AS3798 Guidelines on Earthworks for Commercial and Residential Developments
- Canada Bay Council Development Control
- Health Infrastructure Guidance Notes

4.2.2 Site Access, Roads and Grading

The main entrance to the site is intended through the existing internal road to the north of the site with a driveway access provided at the west of the site, which will be shared by logistics, ambulances, and the general public. The driveway grades down to the south and crosses an existing footpath. The surrounding existing hospital roads are also required to remain operational during the construction of the new buildings.

Consideration has been given to the existing external road levels, where vehicular and pedestrian access points are intended, to allow for the extent of ramping required for access between existing road levels and new building floor levels. Similarly, the FFL has been raised to 8.00 to accommodate the surrounding natural ground levels.

All access roads are being designed in accordance with Australian Standards for parking and road designs as stated in section 4.2.1. Access roads within the site will typically grade between 1% and 10% longitudinal fall and will be designed to prevent scraping on the underside of vehicles including ambulances and trucks.

Cross fall for road lanes are generally between 2-3% to prevent ponding water and allow it to drain away to the kerbs for collection by the inground stormwater drainage.

The extent of new driveway and paving is shown in appendix B. Currently the driveway design has been narrowed at the entry to accommodate the substation clearance zone. This has been reviewed and approved by the traffic consultant.

Due regard needs to be given to accessibility requirements to ensure that equitable access is provided into and around the site to comply with AS1428.1 requirements.

4.3 Stormwater Drainage Design

The following list indicates the relevant infrastructure design guides and standards considered through the Stormwater design. The stormwater design, including new stormwater pipes and stormwater kerb inlet pits are shown in appendix B.

- Australian Rainfall and Runoff (2019) – with AR&R (2016) rainfall datasets sourced from BoM
- AS3500.3:2018 Plumbing and Drainage Part 3: Stormwater Drainage
- Bureau of Meteorology IFD data – sourced from http://www.bom.gov.au
- Austroads: Guide to Road Design, Part 5 Drainage Design 2008
- Managing Urban Stormwater: Soils and Construction, "The Blue Book" – 4th edition 2004
- Canada Bay Development Control Plan

4.3.1 Stormwater Quantity

Stormwater drainage design is to be in accordance with Canada Bay Council design criteria. Stormwater drainage network is generally to be designed for the 5% AEP (20-year ARI) storm event.

Under the Canada Bay DCP Engineering Specifications, the site has an exemption from providing on-site detention. *"Exemptions - OSD will be applied to the developments types as listed in the table under the Section Controls. Exemption from OSD would only apply in the following situations: … The runoff from the development is directly discharged into one of the bays or waterways and does not pass through any public drainage system*" The new development will discharge to the existing stormwater system which discharges directly to Parramatta River which is tide affected. A pollutant trap system, as outlined in section 3.3.2 will be implemented during construction.

To avoid adversely affecting the existing campus system, it is intended that the post development flows be maintained at or below the current predevelopment conditions. Ideally this will be provided through the provision of landscaped areas however if the areas of permeable surfaces are reduced then a provision of a small detention tank will be considered.

Typically, in-ground pit and pipe systems will be designed to capture and convey all runoff for up to and including a 20-year ARI storm event. Overland flow paths will be designed to convey flows from all storms above a 20-year ARI event up to and including the 100-year ARI storm event. The IFD data extracted from the Bureau of Meteorology's IFD tool for the Concord Hospital Site is presented in the Table below and will be used for future design development.

Table 3.1 – Concord Hospital Site IFD Data (Source: BOM)

Storm Duration	5-year ARI (mm/hr)	20-year ARI (mm/hr)	100-year ARI (mm/hr)
5 min	132	172	220
1 hour	37.8	49.2	62.7
12 hour	8.45	11.5	15.5

4.3.2 Stormwater Quality

Stormwater discharging from the site at each of the discharge point will include Water Sensitive Urban Drainage (WSUD) measures, with a treatment train consisting of a gross pollutant trap (GPT) plus a proprietary tertiary treatment filter device. Other measures which can be considered include vegetated swales, buffer strips and bioretention systems, however these may be difficult to implement due to the constrained nature of the site.

The treatment train at each discharge point will be designed to meet the stormwater quality targets outlined in the DCP. More stringent requirements may need to be considered to address the ESD goals for the project. A stormwater quality strategy will be implemented both during construction and post construction.

4.3.3 Flooding

It is not expected that any flood controls will be placed on the development at the Concord Hospital site as the hospital is not identified as subject to regional flooding as shown in figure 3.2 below.

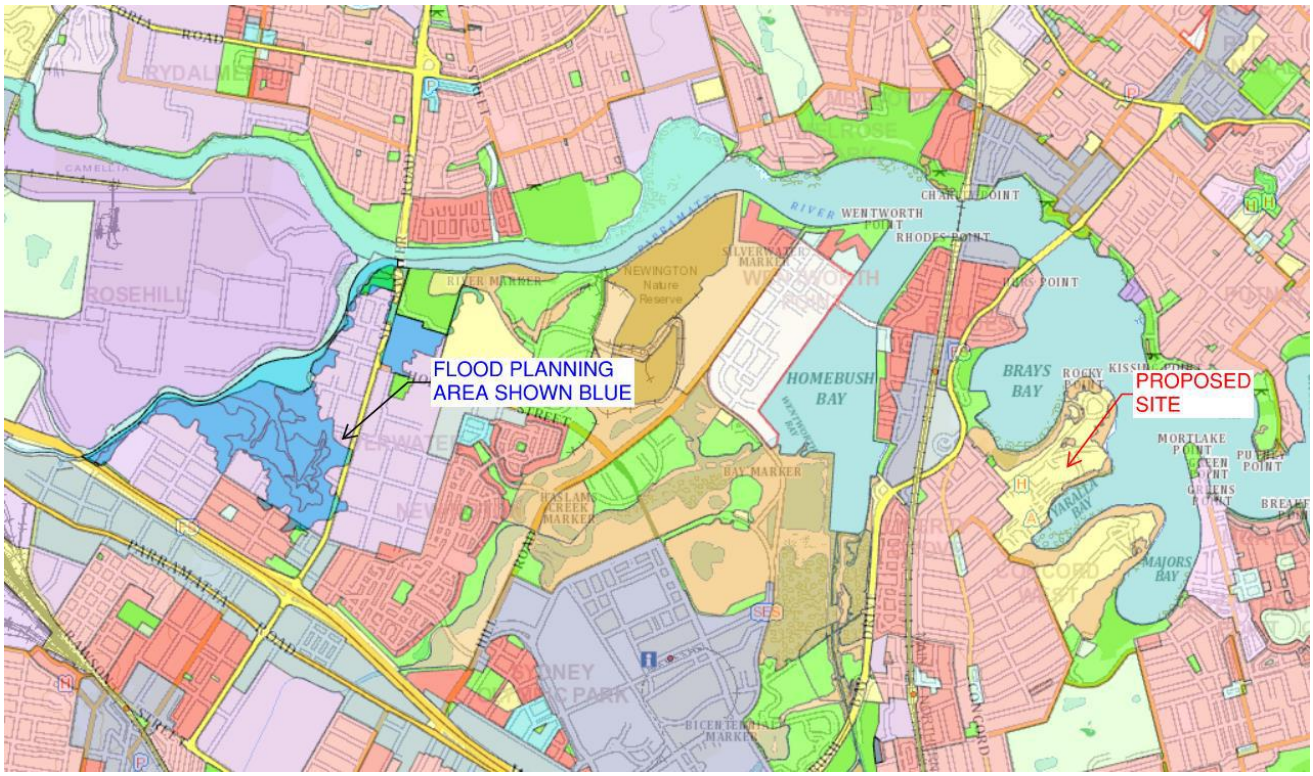


Figure 3.2 – Flooding Planning Area Map (source: NSW ePlanning Spatial Viewer)

Overland flow will occur in significant rainfall events as the existing system is unlikely to have the capacity to convey flows from major storm events.

The Canada Bay DCP specifies the following freeboard requirements:

Freeboard requirements above 1% AEP water surface level				
	Maximum Water Level in (A)			
Finished Floor Level (B)	Adopted Flood planning area	Overland flow path identified by Council as "Minor"	Overland flow paths other than ones identified by Council as "Minor	Mainstream flooding
Residential – Habitable rooms	As per the adopted Plan	300mm	500mm	500mm
Residential – Non-habitable rooms	As per the adopted Plan	300mm	300mm	500mm
Commercial or Industrial – All internal areas	As per the adopted Plan	300mm	500mm	500mm
Carport open on 3 or 4 sides (At Ground Level)	As per the adopted Plan	150mm*	150mm	300mm
Entrance to Basement	As per the adopted Plan	300mm*	Difference between the 100-yr ARI Level and the PMF Level	Difference between the 100-yr ARI Level and the PMF Level
Critical Infrastructure	As per the adopted Plan	300mm	Difference between the 100-yr ARI Level and the PMF Level	Difference between the 100-yr ARI Level and the PMF Level

For planning purposes we recommend that a minimum freeboard of 500mm be provided to any overland flow paths. For schematic design it should be assumed that the top of kerbs are the 1% AEP overland flow level.

4.4 Structural Engineering

4.4.1 Design standards

The structural design shall be in accordance with the latest revision of all relevant structural Australian Standards, relevant structural sections of the BCA and other statutory requirements.

In particular, the structural design will be in accordance with the following relevant Australian Standards and Guidelines:

- AS/NZS 1170.0 (2002) – Structural Design Actions Part 0 General Principles
- AS/NZS 1170.1 (2002) – Structural Design Actions Part 1 Permanent, Imposed and Other Actions
- AS/NZS 1170.2 (2011) – Structural Design Actions Part 2 Wind Loads
- AS 1170.4 (2007) – Structural Design Actions Part 4 Earthquake Actions in Australia
- AS 2159 (2009) – Piling – Design and Installation
- AS 3600 (2018) – Concrete Structures
- AS 3700 (2018) – Masonry Code
- AS 4100(2020) – Steel Structures
- AS 4678 (2002) – Earth Retaining Structures
- Health Infrastructure Guidance Notes

4.4.2 Structural Design Elements

4.4.2.1 Foundations

The building is to be no more than three stories in height, and the structure will be founded on weathered sandstone as per advice from Geotech report prepared by EI Australia. For tender issue, we propose to use 600mm and 450mm diameter piles. The foundation parameters outlined in the report are shown below in figure 3.2.

Rock Class	Serviceability End Bearing Pressure (kPa)[3]	Ultimate Shaft Adhesion - Compression (kPa)[2]
Class V Sandstone	700	100
Class IV Sandstone	2000	500
Class III Sandstone	4000	1000

Figure 3.3: Foundation Parameters from EI Australia Report

To minimise site excavation, the ground floor slab will be designed as a suspended slab on ground supported by bored piers to the underlying rock.

4.4.2.2 Superstructure

The superstructure is type A construction as it is maximum 3 stories. For the tender issue we have adopted a PT slab as an economic form of construction as part of the whole of life analysis in section 4.4.3. A structural grid which does not exceed approximately 8m has been adopted to allow an efficient flat slab system to be utilised. In situ concrete or precast stair and lift cores have also been adopted.

The design aims to align columns through the building to avoid structural transfers. The tender issue drawings are shown in Appendix C which indicate the location of columns. There are a number of columns which do not align due to the architectural wall arrangement, and as such, transfer beams have been designed to support

these columns. It has been confirmed that the fire water storage tank will be located on the western wing of L2. This has resulted in an uplift in structure to account for the additional loads.

A concrete slab has been designed to support the roof plant equipment. All other roof structure is to be of lightweight construction. The roof support corresponds with the typical Type A grid arrangement to enable flexibility. An alternative cost-effective solution is to utilise light gauge steel trusses supported on steel stud load bearing walls should flexibility not be necessary.

4.4.3 Whole of Life Analysis

By adopting a PT slab the slab thicknesses were reduced. Below is a summary of total concrete savings.

Level 1

	PT	R.C.
Reinforcement (tonnes)	30	55
PT (tones)	2.2	N/A
Concrete (tonnes)	915	1100

Level 2

	PT	R.C.
Reinforcement (tonnes)	27	50
PT (tones)	2	N/A
Concrete (tonnes)	815	980

4.4.4 Structural loads and design parameters

The following design loads and parameters will be applicable for the future development and will be used during the design phase of the structural elements.

4.4.5 Floor Loads

Table 3.2 – Floor Loads

Floor Type	Uniform Imposed Load (kPa)	Imposed Point Load (kN)	Ceilings, Services Load, Partitions, Floor Finished (kPa)
Corridors, circulation areas, foyers and stairs	4.0	4.5	1.3
Balcony/terrace	4.0	1.8	2.5
Garden/landscape	0.5	1.4	8.0

General floor areas	3.0	2.7	1.8
Plant rooms	7.5	4.5	2.4
Roof (non-accessible)	0.25	1.4	0.5
Roof (accessible)	3.0	2.7	1.0
PV	0.0	1.4	0.15
Fire Storage Tank	0.0	1.4	25

4.4.6 Floor Vibration

The Footfall response will be checked in accordance with the Concrete Centre Design Guide, with a further check based on the recommendations made within and Murray, Allen and Ungar in the AISC, 2003.

The footfall frequencies and corresponding response factors defined within the NSW Health Design Guidance Note No.1 which the different floor areas will be checked for compliance with the Concrete Centre Design Guide are given in table 3 below.

Table 1.3 - Footfall Response Factor Design Parameters – Concrete Centre Method

Facility/Equipment/Use	Design Response Factor	Footfall Frequency (Hz)
Generally	4	2.5

4.4.7 Earthquake Load Parameters

Table 3.4 – Earthquake Load Parameters

Item	Value
Importance Level	2
Probability Factor, Kp	1.0
Hazard Factor, Z	0.08
Sub-Soil Class	Be
Earthquake Design Category	II
Structural Ductility Factor, μ	1
Structural Performance Factor, Sp	0.77

4.4.8 Wind Load Parameters

Table 3.5 – Wind Load Parameters

Item	Value
Location	Region A2
Importance Level	2
Vu	45m/s
Vs	37m/s
Ms	1.0

Mt	1.0
Md	1.0 (West)
Terrain Category	Varies

Table 3.6 – Wind Site Speeds (ULS)

Direction	Site Speed (m/s)
North	37.11
Northeast	36.01
East	41.92
Southeast	42.32
South	44.64
Southwest	36.51
West	39.98
North West	46.46

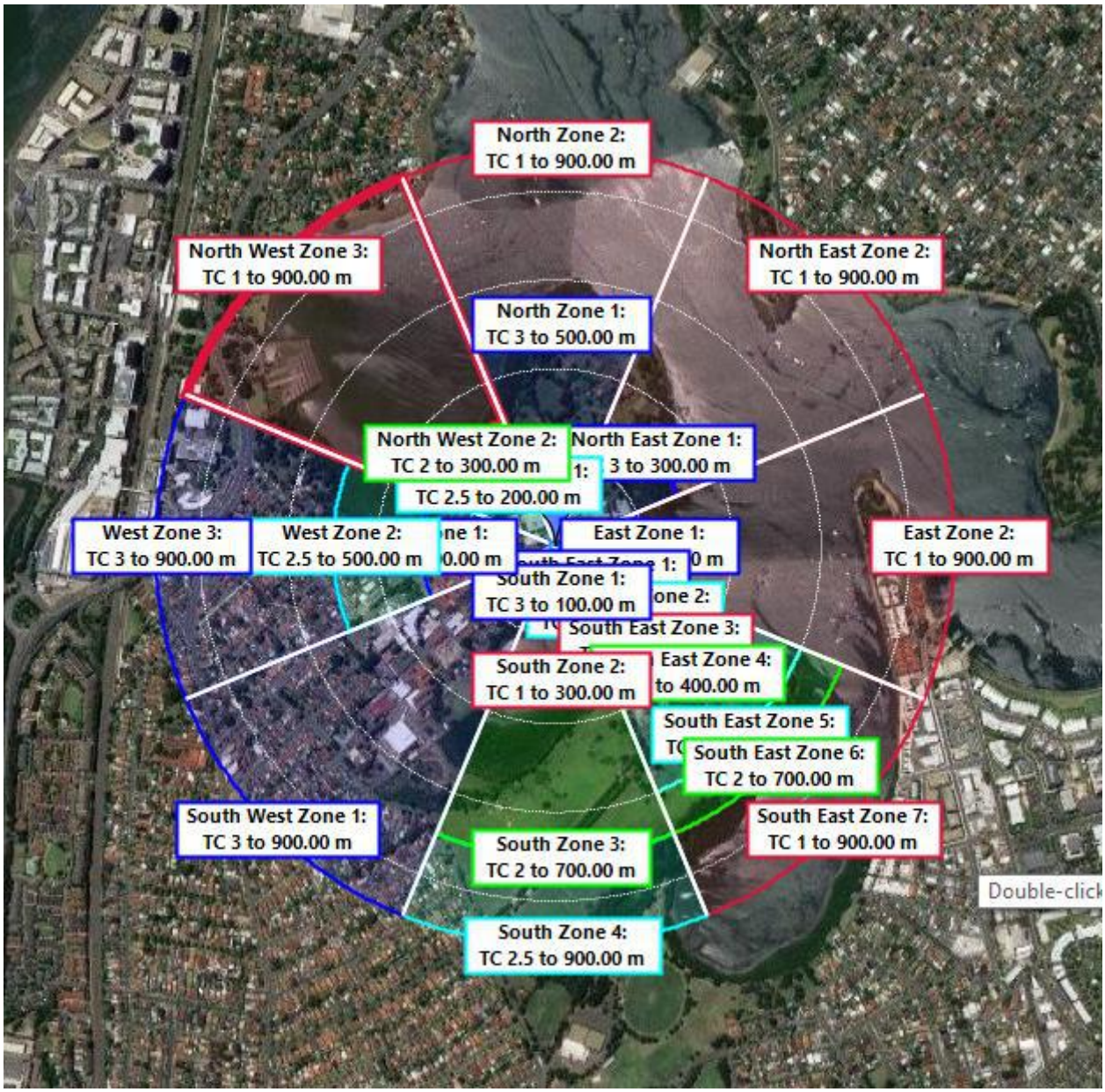


Figure 3.3 – Site Terrain Category Factor (Source: CheckWind)

4.4.9 Fire Rating

Table 3.6 – Fire Ratings

Building Element	FRL
External Walls (Load Bearing)	120/60/30
External Columns	120/-/-
Load Bearing Fire Walls	120/120/120
Shafts (Non-load Bearing)	-/-/-
Other Load Bearing Walls, Beams, Trusses, Columns	120/-/-
Floors	120/120/120

The architect proposed to reduce the column thickness to 200mm, however to achieve ire rating, the thickness of these columns was increased to minimum 250mm.

4.4.10 Waterproofing of concrete slabs

The schematic design allows for concrete slabs to act as roof structures at the eastern wings. The following principles may be adopted to limit the risk of roof leakage:

1. Non trafficable roofs

Either

- Construct a metal deck roof over the concrete slab to provide weather tightness.
- Rainwater is collected in eaves gutters.

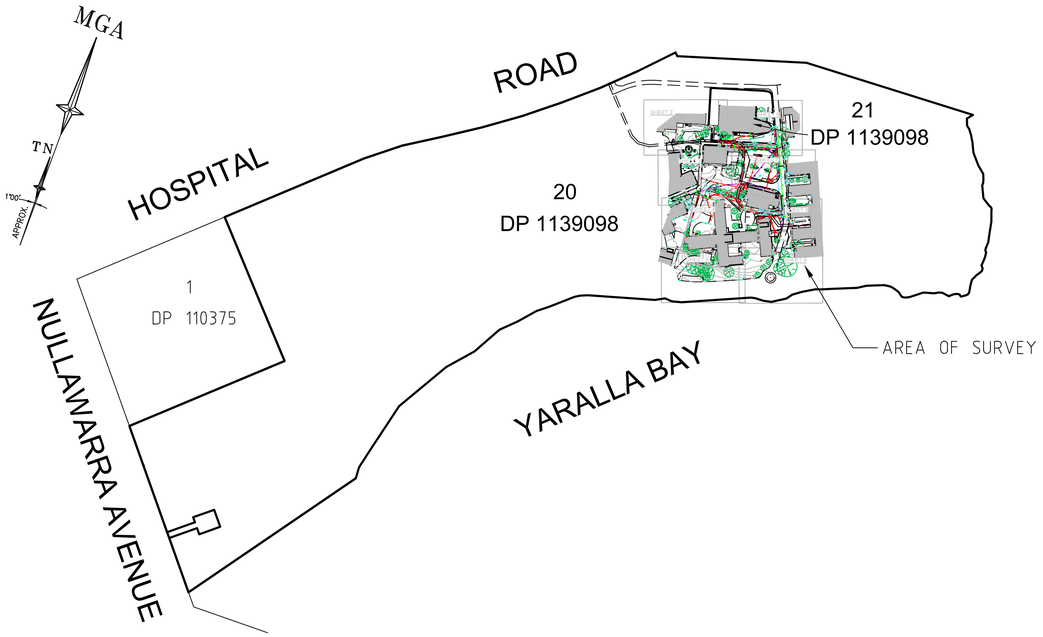
Or

- Provide a waterproof membrane adequately protected from damage and designed as per the requirements of a trafficable roof below. SLHD to advise in the next stage of design.

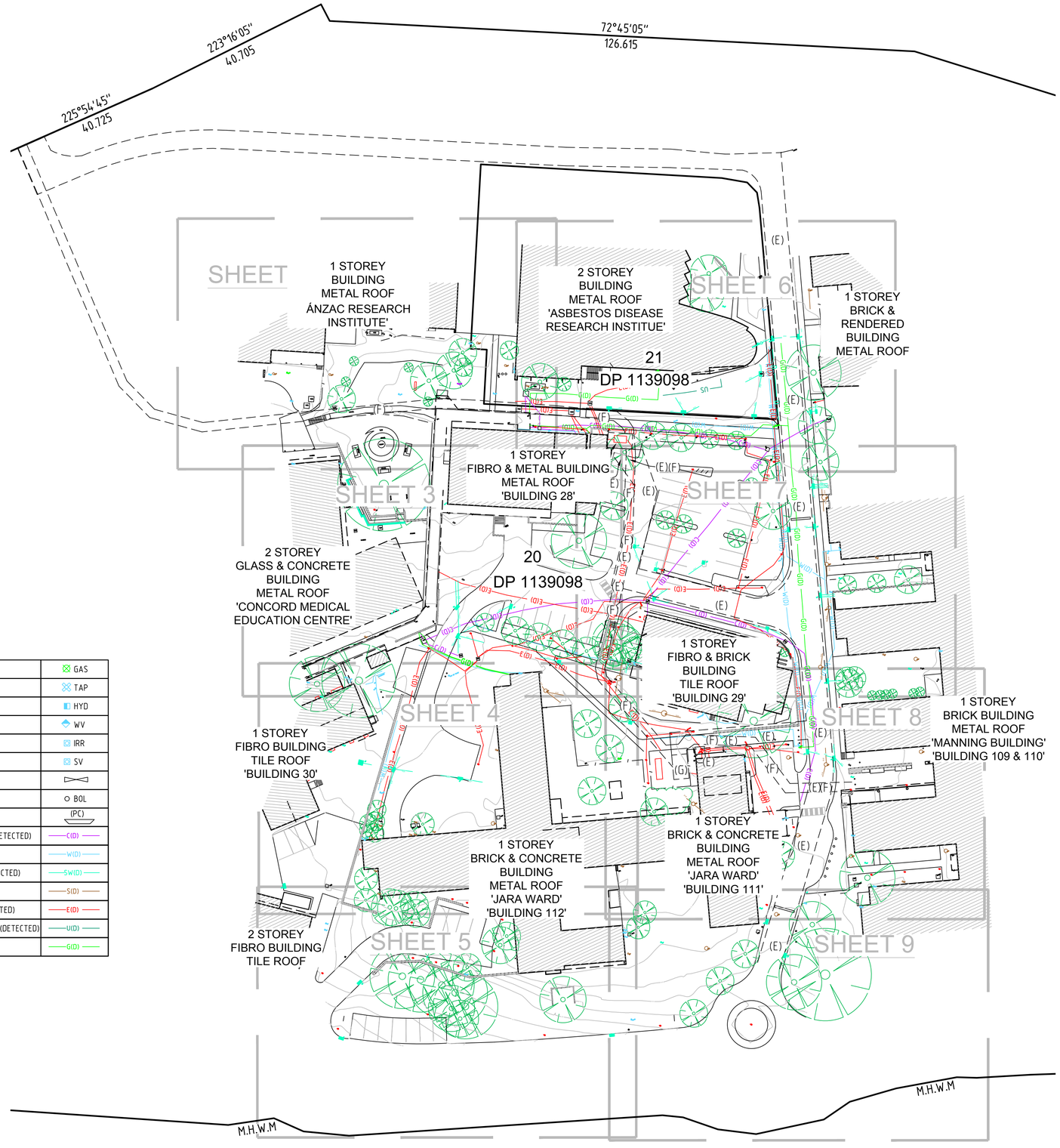
2. Courtyards and trafficable roofs

- Slabs are to be post tensioned to achieve a prestress after losses greater than 2.0 MPa.
- Slab curing is to be specified and monitored.
- Construction joints are to be avoided through these areas.
- Slabs are to fall to drainage points at grades no shallower than 1 in 80.
- Hobs are to be cast integrally with the slab.
- Warranted waterproof membranes are to be installed over the concrete slab.
- The site staff constructing the roof slabs are to be made aware of these prior to construction.

Appendix A - Survey



LOCATION DIAGRAM



EASEMENTS

(E) DENOTES RIGHT OF CARRIAGER WAY VARIABLE WIDTH (DP1158616)
(VIDE SURVEY BY MR SURVEYOR - STEPHEN R EMERY DATED 13-11-07)
(F) DENOTES EASEMENT FOR ELECTRICITY AND OTHER PURPOSES 2 WIDE AND VARIABLE WIDTH (DP1158616)
(VIDE SURVEY BY MR SURVEYOR - STEPHEN R EMERY DATED 13-11-07)
(G) DENOTES PROPOSED EASEMENT FOR ELECTRICITY AND OTHER OTHER PURPOSES 3.3 WIDE (DP1158616)
(VIDE SURVEY BY MR SURVEYOR - STEPHEN R EMERY DATED 13-11-07)

NOTES

1. THE BOUNDARIES HAVE NOT BEEN MARKED ON GROUND
2. THE BOUNDARY SURVEY (DIMENSIONS AND AREA) HAVE BEEN SURVEYED IN ACCORDANCE WITH SURVEYING AND SPATIAL INFORMATION REGULATION 2017 CLAUSE 10 "IDENTIFICATION SURVEYS" AND ARE SUBJECT TO FINAL SURVEY
3. ORIGIN OF **MGA2020** COORDINATES IS TAKEN FROM **SSM 114207** - E:**323428.773**, N:**6254260.312** IN HOSPITAL ROAD **(14/05/2021)**
4. ORIGIN OF LEVELS ON A.H.D. IS TAKEN FROM **SSM 114207** R.L. **11.775** (A.H.D.) IN HOSPITAL ROAD
5. CONTOUR INTERVAL **0.5 m**
6. CONTOURS ARE INDICATIVE ONLY. ONLY SPOT LEVELS SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION
7. KERB LEVELS ARE TO THE TOP OF KERB UNLESS SHOWN OTHERWISE
8. FLOOR LEVELS SHOWN ARE THRESHOLD LEVELS. NO INVESTIGATION OF INTERNAL FLOOR LEVELS HAS BEEN UNDERTAKEN
9. AN INVESTIGATION OF UNDERGROUND SERVICES HAS BEEN MADE. UNDERGROUND SERVICES HAVE BEEN DETECTED BY "QASAR " AND ARE APPROXIMATE ONLY. SOME SERVICES SUCH AS FIRE&WATER SUPPLY, GAS AND OPTICAL FIBRE CABLING DO NOT HAVE METALLIC TRACING WIRES OR METAL PIPES AND MAY NOT HAVE BEEN DETECTED.
10. 8/.4/7 DENOTES TREE SPREAD OF 8m, TRUNK DIAMETER OF 0.4m & APPROX HEIGHT OF 7m
11. SHOWS APPROXIMATE POSITION OF ROAD LINEMARKING AND IS INDICATIVE ONLY
12. BEARINGS SHOWN ARE MGA (MAP GRID OF AUSTRALIA) ADD APPROX. 1°00' FOR TRUE NORTH

LEGEND

BENCH MARK	▲	GAS VALVE	GAS
INSPECTION PIT	IP	WATER TAP	TAP
PIT WITH CONCRETE LID	CLID	HYDRANT	HYD
PIT WITH METAL LID	MLID	WATER VALVE	WV
COMMS PIT	COM	IRRIGATION	IRR
ELECTRICITY PIT	EPIT	STOP VALVE	SV
POWER POLE	PP	GATE	
ELECTRIC LIGHT BOLLARD	LB	BOLLARD	BOL
ELECTRIC LIGHT POLE	ELP	PRAM CROSSING	(PC)
SEWER MANHOLE	SMH	COMMUNICATIONS (DETECTED)	C(D)
SEWER INSPECTION POINT	SIP	WATER (DETECTED)	W(D)
GIPD DRAIN		STORMWATER (DETECTED)	SW(D)
GIPD DRAIN	GD	SEWER (DETECTED)	S(D)
GIPD INLET PIT	GIP	ELECTRICITY (DETECTED)	E(D)
DOWNPIPE	DP	UNKNOWN SERVICE (DETECTED)	U(D)
		GAS (DETECTED)	G(D)

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GDA2020

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Client - HEALTH INFRASTRUCTURE
Drawing title
PLAN OF DETAIL AND LEVELS OVER PART LOT 20 IN DP1139098 KNOWN AS CONCORD HOSPITAL, CONCORD WEST

datum AHD
site Area N/A
LGA CANADA BAY

reference number 33907 020DT
scale 1:500 @A1
date of survey 15/08/2022
SHEET 1 OF 11

MGA

TN

100° APPROX.

1 STOREY
BUILDING
METAL ROOF
ÁNZAC RESEARCH INSTITUTE'

20
DP 1139098

20
DP 1139098

PLANT
CONCRETE PLINTH

CONCRETE LOADING DOCK

STEPS

GRASS

CONCRETE

BITUMEN TURNING BAY

GRAVEL

FOOTPATH

BOTTOM OF BANK

TOP OF BANK

CLID

MLID

SWITCHB

METAL AWNING

METAL FENCE

PARAPET 17.66

PARAPET 16.84

PAVERS

BLOCK

TILED

FIREPIT

SEAT

GRAVEL

CONCRETE

TOP OF GUTTER 11.95

METAL AWNING OVER

1 STOREY
FIBRO &
METAL
BUILDING
METAL ROOF
'BUILDING 28'

ADJOINS

ADJOINS

SHEET 6

SHEET 3

SEE SHEET 1 FOR LEGEND & NOTES

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date of survey 15/08/2022
SHEET 2 OF 11

ADJOINS

SHEET 2

MGA

TN

APPROX.

2 STOREY
GLASS & CONCRETE BUILDING
METAL ROOF
'CONCORD MEDICAL EDUCATION CENTRE'

20
DP 1139098

1 STOREY
FIBRO &
METAL
BUILDING
METAL ROOF
'BUILDING 28'

PLANT
INACCESIBLE

PLANT
INACCESIBLE

METAL
SHED

METAL
SHED

GARAGE

SEE ELEVATIONS FOR PARAPET LEVELS

SEE SHEET 1 FOR LEGEND & NOTES

ADJOINS

SHEET 4

SHEET 7

ADJOINS

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Drawing title
PLAN OF DETAIL AND LEVELS OVER PART LOT 20 IN DP1139098 KNOWN AS CONCORD HOSPITAL, CONCORD WEST

datum	AHD	reference number	33907 020DT
site Area	N/A	scale	1:100 @A1
LGA	CANADA BAY	date of survey	15/08/2022
		SHEET OF	3 11

ADJOINS SHEET 3

ADJOINS SHEET 5

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LGA CANADA BAY
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scale 1:100 @A1
date of survey 15/08/2022
SHEET 4 OF 11

ADJOINS

SHEET 4

CONTAINER

TOP OF GUTTER 10.88

RIDGE 14.11

2 STOREY FIBRO BUILDING TILE ROOF

GARDEN

BRICK RET WALL

KERB

GRASS

ROAD

ACCESS

BITUMEN

PAVED

FOOTPATH

BRICK RET

WALL

GARDEN

SIGN

PAVED

PARKING

(PC)

GARDEN

GARDEN

MGA

TN

APPROX. 1°00'

METAL AWNING

RETAIN WALL

GARDEN

PARAPET 11.59

GRASS

WALL

TIMBER RET

GRASS

BITUMEN

PARKING

TOP

OF

KERB

ROAD

ACCESS

BITUMEN

SHEET 9

ADJOINS

20

DP 1139098

H.W.M

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reference number 33907 020DT

scale 1:100 @A1

date of survey 15/08/2022

SHEET 5 OF 11

MGA

TN

APPROX. 1000

SHEET 2

ADJOINS

2 STOREY
BUILDING
METAL ROOF
'ASBESTOS DISEASE RESEARCH INSTITUE'

21

DP 1139098

1 STOREY
BRICK &
RENDERED
BUILDING
METAL ROOF

1 STOREY
FIBRO &
METAL
BUILDING
METAL ROOF
'BUILDING 28'

METAL
SHED

PLANT

(E)

(F)

(G)

WALL

FOOTPATH

GRAVEL

GARDEN

CONCRETE

BITUMEN

ACCESS

METAL FENCE

PARAPET 14.36

PARAPET 14.60

PARAPET 14.70

CONCRETE FOOTPATH

AWNING OVER

AWNING 13.21

RENDERED WALL

PARAPET 14.61

PARAPET 14.38

GATE

STEPS

PARAPET 17.66

TOP REND WALL 17.66

GRASS

LOADING

DOCK

ROAD

BRICK RET WALL

SUBSTATION KIOSK

TOP OF GUTTER 12.23

TOP OF GUTTER 12.69

BITUMEN CARPARK

FOOTPATH

KERB

TOP

OF

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ADJOINS

SHEET 7

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datum AHD
site Area N/A
LGA CANADA BAY

reference number 33907 020DT
scale 1:100 @A1
date of survey 15/08/2022
SHEET 6 OF 11

ADJOINS
SHEET 6

MGA
TN
1°00'
APPROX.

PLANT INACCESIBLE
METAL SHED
BITUMEN CARPARK
GRASS
CONCRETE
FOOTPATH
ROAD
ACCESS
PAVED
RENDERED WALL
FENCE
GATE
METAL
KERB
TOP OF GUT
BANK
EDGE OF BITUMEN
BIKE RACKS
SPEED BUMP
SIGN
AWNING
RAMP
STEPS
WALL
PALING FENCE
CONCRETE DISH DRAIN
PALING TOP OF GUTTER 11.75
CONCRETE TOP OF GUTTER 11.77
RIDGE 15.13
RIDGE 14.05
AWNING 11.15
PARAPET 12.59

1 STOREY
FIBRO & BRICK
BUILDING
TILE ROOF
'BUILDING 29'

1 STOREY
BRICK BUILDING
METAL ROOF
'MANNING BUILDING'
'BUILDING 109 & 110'

20
DP 1139098

SHEET 3
ADJOINS
SHEET 8

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datum	AHD
site Area	N/A
LGA	CANADA BAY
reference number	33907 020DT
scale	1:100 @A1
date of survey	15/08/2022
SHEET	7
OF	11

ADJOINS

SHEET 7

SHEET 4

ADJOINS

1 STOREY FIBRO & BRICK BUILDING TILE ROOF 'BUILDING 29'

1 STOREY BRICK & CONCRETE BUILDING METAL ROOF 'JARA WARD' 'BUILDING 111'

1 STOREY BRICK BUILDING METAL ROOF 'MANNING BUILDING' 'BUILDING 109 & 110'

1 STOREY BRICK BUILDING METAL ROOF 'MANNING BUILDING' 'BUILDING 109 & 110'

1 STOREY BRICK BUILDING METAL ROOF 'MANNING BUILDING' 'BUILDING 109 & 110'

20
DP 1139098

MGA

TN

APPROX

SEE SHEET 1 FOR LEGEND & NOTES

ADJOINS

SHEET 9

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scale 1:100 @A1
date of survey 15/08/2022
SHEET 8 OF 11

ADJOINS

SHEET 8

SHEET 5

ADJOINS

METAL AWNING

REND WALL

GRASS

GRASS

GRASS

GARDEN

GARDEN

(E)

ROAD

KERB

SPEED BUMP

CONCRETE

PAVERS

ACCESS

SIGN

TOP

BITUMEN

FENCE

1 STOREY
BRICK BUILDING
METAL ROOF
'MANNING BUILDING'
'BUILDING 109 & 110'

20

DP 1139098

M.H.W.M

MGA

TN

APPROX. 10.0°

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SCALE 1:100 @ A1

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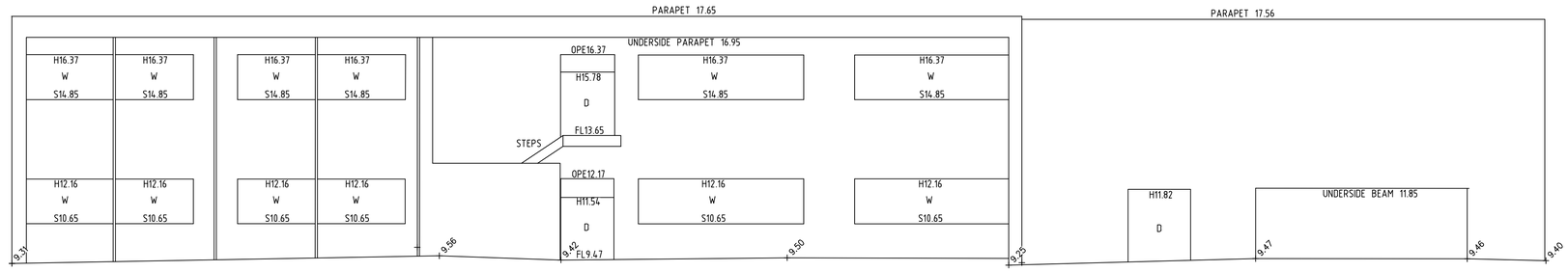
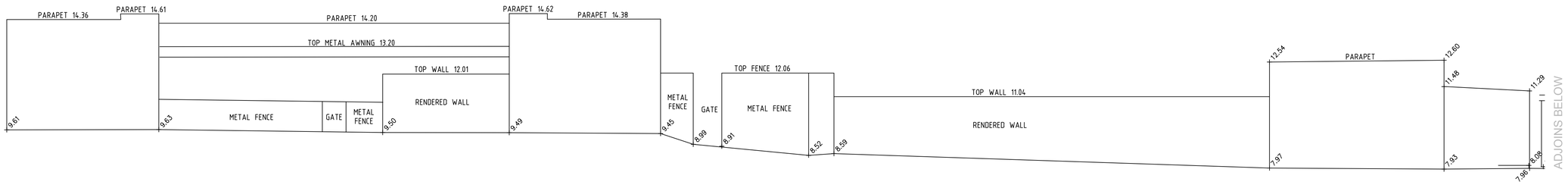
site Area N/A
LGA CANADA BAY

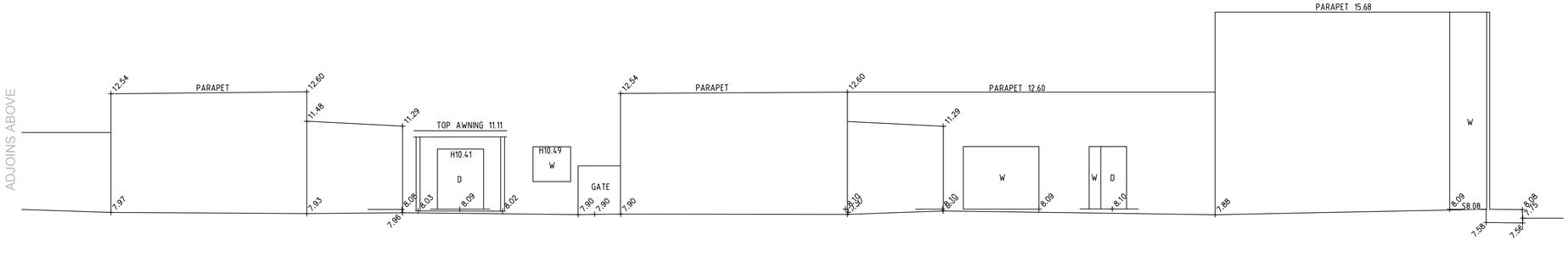
reference number 33907 020DT
scale 1:100 @A1
date of survey 15/08/2022
SHEET 9 OF 11



ASBESTOS DISEASE RESEARCH INSTITUTE
SOUTHERRN ELEVATION



MANNING BUILDING & STREETSCAPE - BUILDING No. 109 & 110
WESTERN ELEVATION



MANNING BUILDING & STREETSCAPE - BUILDING No. 109 & 110
WESTERN ELEVATION

DIAL BEFORE YOU DIG www.1100.com.au

GDA2020

0 10 20 30 40 50

SCALE 1:500 @ A1

Revision	Date	Description	Reference
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Revision	Date	Description	Reference
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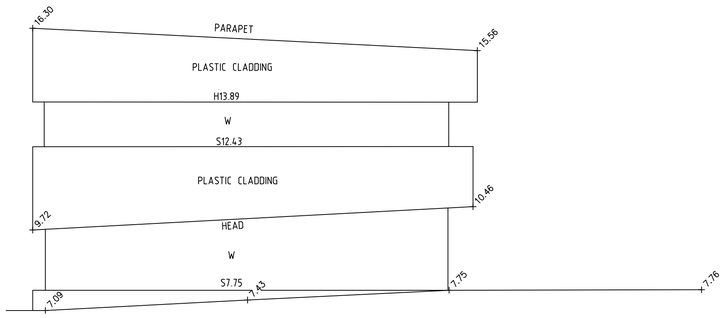
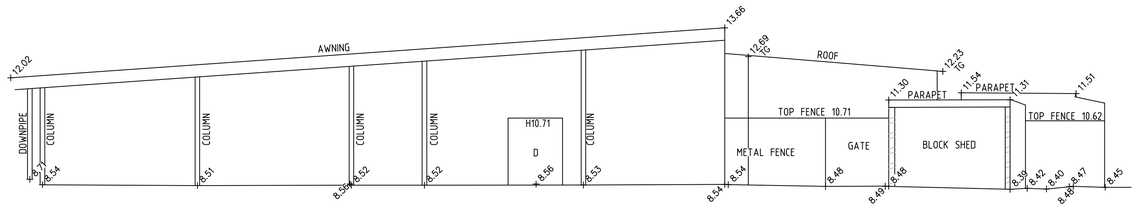
datum AHD
site Area N/A
LGA CANADA BAY

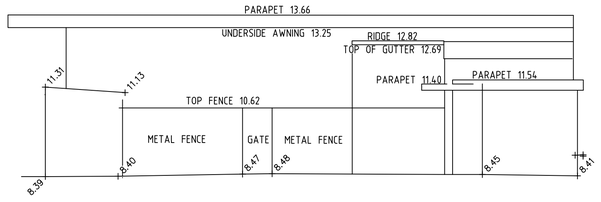
reference number 33907 020DT
scale 1:100 @A1
date of survey 15/08/2022
SHEET 10 OF 11



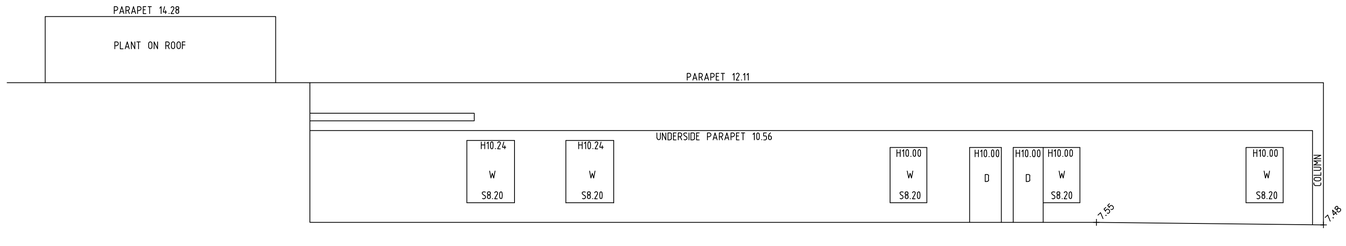
CONCORD MEDICAL EDUCATION CENTRE
EASTERN ELEVATION



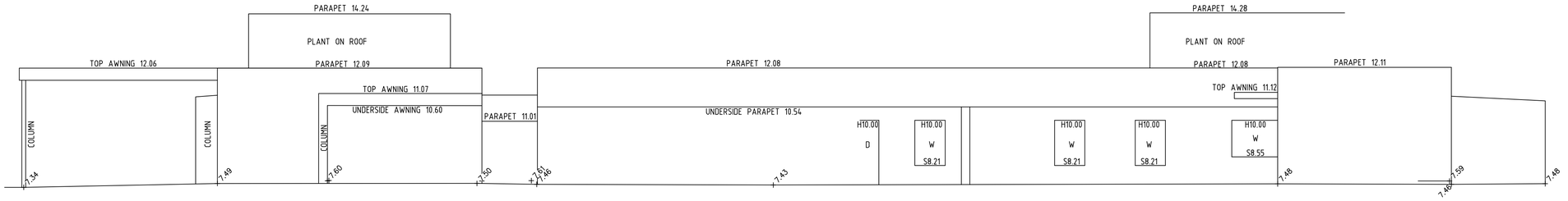
BUILDING No 28
SOUTHERN ELEVATION



BUILDING No 28
SOUTHERN ELEVATION



JARA WARD BUILDING No 112)
EASTERN ELEVATION



JARA WARD BUILDING No 111 + 112)
NORTHERN ELEVATION

DIAL BEFORE YOU DIG www.1100.com.au

GDA2020

0 10 20 30 40 50

SCALE 1:500 @ A1

Revision	Date	Description	Reference
H	00/00/00	-	00
G	00/00/00	-	00
F	00/00/00	-	00
E	00/00/00	-	00
D	00/00/00	-	00
C	00/00/00	-	00
B	00/00/00	-	00
A	00/00/00	-	00

LTS CONFIDENCE TOGETHER
www.ltsl.com.au | P 1300 587 000

THIS IS THE PLAN REFERRED TO IN MY LETTER DATED:

.....
Registered Surveyor NSW

Client - HEALTH INFRASTRUCTURE

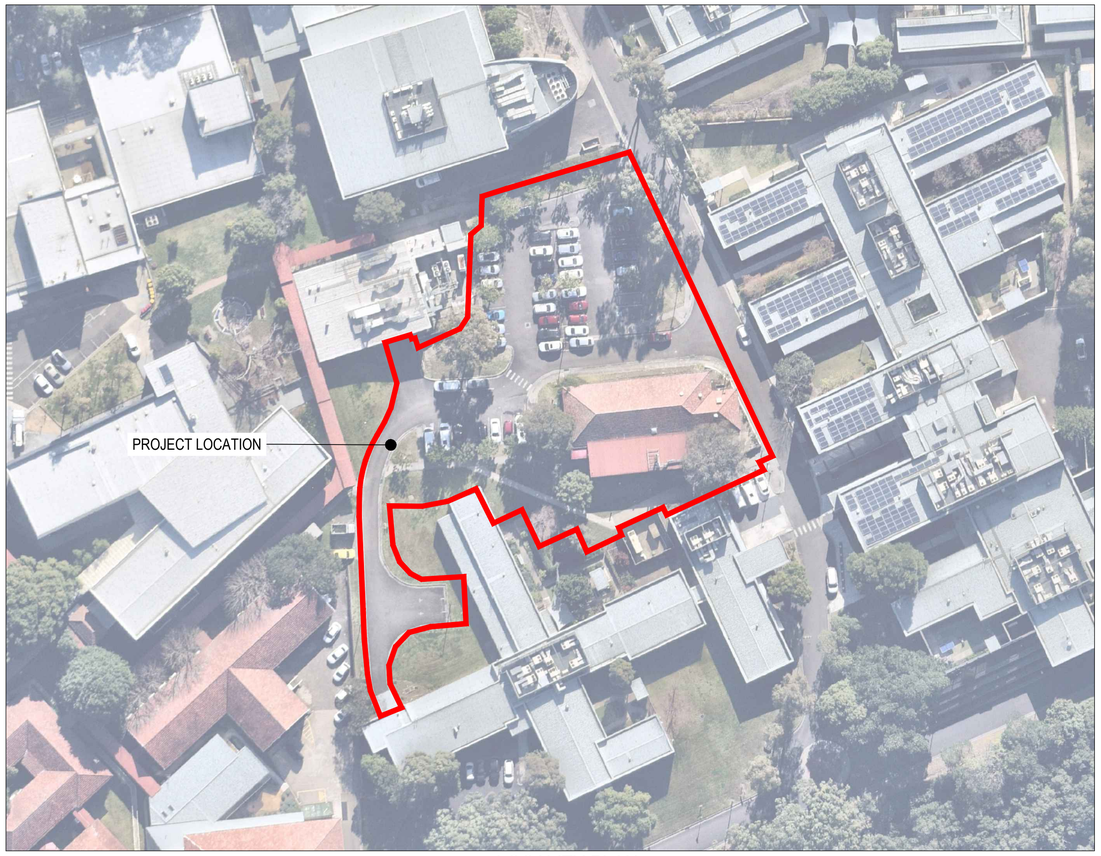
Drawing title
PLAN OF DETAIL AND LEVELS OVER PART LOT 20 IN DP1139098 KNOWN AS CONCORD HOSPITAL, CONCORD WEST

datum AHD
site Area N/A
LGA CANADA BAY

reference number 33907 020DT
scale 1:100 @A1
date of survey 15/08/2022
SHEET 11 OF 11

Appendix B - Civil 100% Design Development

CONCORD FMH
109 HOSPITAL RD, CONCORD, NSW, 2139
CIVIL ENGINEERING SERVICES



LOCALITY PLAN
NOT TO SCALE

DRAWING INDEX	
DWG No.	DESCRIPTION
221192_0001	COVER SHEET AND DRAWING INDEX
221192_0111	ENABLING WORKS CONSTRUCTION NOTES
221192_0115	ENABLING WORKS DETAILS - SHEET 1
221192_0116	ENABLING WORKS DETAILS - SHEET 2
221192_0450	SEDIMENT AND EROSION CONTROL PLAN
221192_1000	SITE WORKS AND STORMWATER PLAN

North

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by: Approver

Issue.	Description	Date	Drawn	Approved
0	100% ISSUE	06.09.2023	MD	SN

-1 0 1m at full size 250m

Client
HEALTH INFRASTRUCTURE

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ENGINEERS |MANAGERS |INFRASTRUCTURE PLANNERS |DEVELOPMENT CONSULTANTS

Drawing Title
COVER SHEET AND DRAWING INDEX

Drawn	Date	Scale A1	Q.A. Check	Date
MD	06/09/2023	N.T.S.	SC	06/09/2023
Designed	Project No.		Dwg No.	Issue
SN	221192		0001	0

Autodesk Docs://SC152 Health Translation Hub/RH/ACOR-ST-rvt
25/11/2022 11:42:08 AM

SITEWORKS NOTES

1. ORIGIN OF LEVELS :- AUSTRALIAN HEIGHT DATUM (A.H.D.)

2. CONTRACTOR MUST VERIFY ALL DIMENSIONS AND EXISTING LEVELS ON SITE PRIOR TO COMMENCEMENT OF WORK.

3. ALL WORK IS TO BE UNDERTAKEN IN ACCORDANCE WITH THE DETAILS SHOWN ON THE DRAWINGS, THE SPECIFICATIONS AND THE DIRECTIONS OF THE PRINCIPAL'S REPRESENTATIVE.

4. EXISTING SERVICES HAVE BEEN PLOTTED FROM SUPPLIED DATA AND AS SUCH THEIR ACCURACY CANNOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE PRINCIPAL'S REPRESENTATIVE. CLEARANCES SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY.

5. WHERE NEW WORKS ABUT EXISTING THE CONTRACTOR SHALL ENSURE THAT A SMOOTH EVEN PROFILE, FREE FROM ABRUPT CHANGES IS OBTAINED.

6. THE CONTRACTOR SHALL ARRANGE ALL SURVEY SETOUT TO BE CARRIED OUT BY A REGISTERED SURVEYOR.

7. CARE IS TO BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES. NO MECHANICAL EXCAVATIONS ARE TO BE UNDERTAKEN OVER COMMUNICATIONS OR ELECTRICAL SERVICES. HAND EXCAVATE IN THESE AREAS.

8. ALL SERVICE TRENCHES UNDER VEHICULAR PAVEMENTS SHALL BE BACKFILLED WITH AN APPROVED NON-NATURAL GRANULAR MATERIAL AND COMPACTED TO 98% STANDARD MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS.1289.5.1.1.

9. ALL TRENCH BACKFILL MATERIAL SHALL BE COMPACTED TO THE SAME DENSITY AS THE ADJACENT MATERIAL.

10. ON COMPLETION OF PIPE INSTALLATION ALL DISTURBED AREAS MUST BE RESTORED TO ORIGINAL, INCLUDING KERBS, FOOTPATHS, CONCRETE AREAS, GRAVEL AND GRASSED AREAS AND ROAD PAVEMENTS.

11. PROVIDE 10mm WIDE EXPANDING CORK JOINTS BETWEEN CONCRETE PAVEMENTS AND ALL BUILDINGS , WALLS, FOOTINGS, COLUMNS, KERBS, DISH DRAINS, GRATED DRAINS, BOLLARD FOOTINGS ETC

12. CONTRACTOR TO OBTAIN ALL AUTHORITY APPROVALS.

13. ALL BATTERS TO BE GRASSED LINED WITH MINIMUM 100 TOPSOIL AND APPROVED COUCH LAID AS TURF.

14. MAKE SMOOTH TRANSITION TO EXISTING SERVICES AND MAKE GOOD.

15. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY DIVERSION DRAINS AND MOUNDS TO ENSURE THAT AT ALL TIMES EXPOSED SURFACES ARE FREE DRAINING AND WHERE NECESSARY EXCAVATE SUMPS AND PROVIDE PUMPING EQUIPMENT TO DRAIN EXPOSED AREAS.

16. THESE PLANS SHALL BE READ IN CONJUNCTION WITH APPROVED ARCHITECTURAL, STRUCTURAL, HYDRAULIC AND ELECTRICAL DRAWINGS AND SPECIFICATIONS.

17. TRENCHES THROUGH EXISTING ROAD AND CONCRETE PAVEMENTS SHALL BE SAWCUT TO FULL DEPTH OF CONCRETE AND A MIN 50mm IN BITUMINOUS PAVING.

18. ALL BRANCH GAS AND WATER SERVICES UNDER DRIVEWAYS AND BRICK PAVING SHALL BE LOCATED IN Ø80 uPVC SEWER GRADE CONDUITS EXTENDING A MIN OF 500mm PAST PAVING.

19. ON COMPLETION OF WORKS ALL DISTURBED AREAS MUST BE RESTORED TO ORIGINAL INCLUDING, BUT NOT LIMITED TO, KERBS, FOOTPATHS, CONCRETE AREAS, GRASS AND LANDSCAPED AREAS.

EROSION AND SEDIMENT CONTROL NOTES

GENERAL INSTRUCTIONS

1. THIS SOIL AND WATER MANAGEMENT PLAN IS TO BE READ IN CONJUNCTION WITH OTHER ENGINEERING PLANS RELATING TO THIS DEVELOPMENT.

2. CONTRACTORS WILL ENSURE THAT ALL SOIL AND WATER MANAGEMENT WORKS ARE UNDERTAKEN AS INSTRUCTED IN THIS SPECIFICATION AND CONSTRUCTED FOLLOWING THE GUIDELINES OF "MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION", DEPT OF HOUSING, 2004 (BLUE BOOK).

3. ALL SUBCONTRACTORS WILL BE INFORMED OF THEIR RESPONSIBILITIES IN REDUCING THE POTENTIAL FOR SOIL EROSION AND POLLUTION TO DOWNSLOPE AREAS.

LAND DISTURBANCE INSTRUCTIONS

1. DISTURBANCE TO BE NO FURTHER THAN 5 (PREFERABLY 2) METRES FROM THE EDGE OF ANY ESSENTIAL ENGINEERING ACTIVITY AS SHOWN ON APPROVED PLANS. ALL SITE WORKERS WILL CLEARLY RECOGNISE THESE ZONES THAT, WHERE APPROPRIATE, ARE IDENTIFIED WITH BARRIER FENCING (UPSLOPE) AND SEDIMENT FENCING (DOWNSLOPE) OR SIMILAR MATERIALS.

2. ACCESS AREAS ARE TO BE LIMITED TO A MAXIMUM WIDTH OF 10 METRES THE SITE MANAGER WILL DETERMINE AND MARK THE LOCATION OF THESE ZONES ON-SITE. ALL SITE WORKERS WILL CLEARLY RECOGNISE THESE BOUNDARIES THAT, WHERE APPROPRIATE, ARE IDENTIFIED WITH BARRIER FENCING (UPSLOPE) AND SEDIMENT FENCING (DOWNSLOPE) OR SIMILAR MATERIALS.

3. ENTRY TO LANDS NOT REQUIRED FOR CONSTRUCTION OR ACCESS IS PROHIBITED EXCEPT FOR ESSENTIAL THINNING OF PLANT GROWTH.

4. WORKS ARE TO PROCEED IN THE FOLLOWING SEQUENCE:

   a. INSTALL ALL BARRIER AND SEDIMENT FENCING WHERE SHOWN ON THE PLAN.
   b. CONSTRUCT THE STABILISED SITE ACCESS.
   c. CONSTRUCT DIVERSION DRAINS AS REQUIRED.
   d. INSTALL MESH AND GRAVEL INLETS FOR ANY ADJACENT KERB INLETS.
   e. INSTALL GEOTEXTILE INLET FILTERS AROUND ANY ON-SITE DROP INLET PITS.
   f. CLEAR SITE AND STRIP AND STOCKPILE TOPSOIL IN LOCATIONS SHOWN ON THE PLAN.
   g. UNDERTAKE ALL ESSENTIAL CONSTRUCTION WORKS ENSURING THAT ROOF AND/OR PAVED AREA STORMWATER SYSTEMS ARE CONNECTED TO PERMANENT DRAINAGE AS SOON AS PRACTICABLE.
   h. GRADE LOT AREAS TO FINAL GRADES AND APPLY PERMANENT STABILISATION (LANDSCAPING) WITHIN 20 DAYS OF COMPLETION OF CONSTRUCTION WORKS.
   i. REMOVE TEMPORARY EROSION CONTROL MEASURES AFTER THE PERMANENT LANDSCAPING HAS BEEN COMPLETED.

5. ENSURE THAT SLOPE LENGTHS DO NOT EXCEED 80 METRES WHERE PRACTICABLE. SLOPE LENGTHS ARE DETERMINED BY SILTATION FENCING AND CATCH DRAIN SPACING.

6. ON COMPLETION OF MAJOR WORKS LEAVE DISTURBED LANDS WITH A SCARIFIED SURFACE TO ENCOURAGE WATER INFILTRATION AND ASSIST WITH KEYING TOPSOIL LATER.

EROSION AND SEDIMENT CONTROL NOTES

SITE INSPECTION AND MAINTENANCE INSTRUCTIONS

1. THE SITE PRINCIPAL'S REPRESENTATIVE WILL INSPECT THE SITE AT LEAST WEEKLY AND AT THE CONCLUSION OF EVERY STORM EVENT TO:

   a. ENSURE THAT DRAINS OPERATE PROPERLY AND TO EFFECT ANY NECESSARY REPAIRS.
   b. REMOVE SPILLED SAND OR OTHER MATERIALS FROM HAZARD AREAS, INCLUDING LANDS CLOSER THAN 5 METRES FROM AREAS OF LIKELY CONCENTRATED OR HIGH VELOCITY FLOWS ESPECIALLY WATERWAYS AND PAVED AREAS.
   c. REMOVE TRAPPED SEDIMENT WHENEVER THE DESIGN CAPACITY OF THAT STRUCTURE HAS BEEN EXCEEDED.
   d. ENSURE REHABILITATED LANDS HAVE EFFECTIVELY REDUCED THE EROSION HAZARD AND TO INITIATE UPGRADING OR REPAIR AS NECESSARY.
   e. CONSTRUCT ADDITIONAL EROSION AND/OR SEDIMENT CONTROL WORKS AS MIGHT BECOME NECESSARY TO ENSURE THE DESIRED PROTECTION IS GIVEN TO DOWNSLOPE LANDS AND WATERWAYS. MAKE ONGOING CHANGES TO THE PLAN WHERE IT PROVES INADEQUATE IN PRACTICE OR IS SUBJECTED TO CHANGES IN CONDITIONS ON THE WORK-SITE OR ELSEWHERE IN THE CATCHMENT.
   f. MAINTAIN EROSION AND SEDIMENT CONTROL STRUCTURES IN A FULLY FUNCTIONING CONDITION UNTIL ALL EARTHWORK ACTIVITIES ARE COMPLETED AND THE SITE IS REHABILITATED.

2. THE PRINCIPAL'S REPRESENTATIVE WILL KEEP A LOGBOOK MAKING ENTRIES AT LEAST WEEKLY, IMMEDIATELY BEFORE FORECAST RAIN AND AFTER RAINFALL. ENTRIES WILL INCLUDE:

   a. THE VOLUME AND INTENSITY OF ANY RAINFALL EVENTS.
   b. THE CONDITION OF ANY SOIL AND WATER MANAGEMENT WORKS.
   c. THE CONDITION OF VEGETATION AND ANY NEED TO IRRIGATE.
   d. THE NEED FOR DUST PREVENTION STRATEGIES.
   e. ANY REMEDIAL WORKS TO BE UNDERTAKEN. THE LOGBOOK WILL BE KEPT ON-SITE AND MADE AVAILABLE TO ANY AUTHORISED PERSON UPON REQUEST. IT WILL BE GIVEN TO THE PROJECT MANAGER AT THE CONCLUSION OF THE WORKS.

SEDIMENT CONTROL INSTRUCTIONS

1. SEDIMENT FENCES WILL BE INSTALLED AS SHOWN ON THE PLAN AND ELSEWHERE AT THE DISCRETION OF THE PRINCIPAL'S REPRESENTATIVE TO CONTAIN SOIL AS NEAR AS POSSIBLE TO THEIR SOURCE.

2. SEDIMENT FENCES WILL NOT HAVE CATCHMENT AREAS EXCEEDING 900 SQUARE METRES AND HAVE A STORAGE DEPTH OF AT LEAST 0.6 METRES.

3. SEDIMENT REMOVED FROM ANY TRAPPING DEVICES WILL BE RELOCATED WHERE FURTHER POLLUTION TO DOWNSLOPE LANDS AND WATERWAYS CANNOT OCCUR.

4. STOCKPILES ARE NOT TO BE LOCATED WITHIN 5 METRES OF HAZARD AREAS INCLUDING AREAS OF HIGH VELOCITY FLOWS SUCH AS WATERWAYS, PAVED AREAS AND DRIVEWAYS.

5. WATER WILL BE PREVENTED FROM DIRECTLY ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS THE CATCHMENT AREA HAS BEEN PERMANENTLY LANDSCAPED AND/OR WATER HAS BEEN TREATED BY AN APPROVED DEVICE.

6. TEMPORARY SEDIMENT TRAPS WILL REMAIN IN PLACE UNTIL AFTER THE LANDS THEY ARE PROTECTING ARE COMPLETELY REHABILITATED.

7. ACCESS TO SITES SHOULD BE STABILISED TO REDUCE THE LIKELIHOOD OF VEHICLES TRACKING SOIL MATERIALS ONTO PUBLIC ROADS AND ENSURE ALL-WEATHER ENTRY/EXIT.

EROSION AND SEDIMENT CONTROL NOTES

SOIL EROSION CONTROL INSTRUCTIONS

1. EARTH BATTERS WILL BE CONSTRUCTED WITH AS LOW A GRADIENT AS PRACTICABLE BUT NO STEEPER, UNLESS OTHERWISE NOTED, THAN:

   a. 2(H):1(V) WHERE SLOPE LENGTH LESS THAN 12 METRES
   b. 2.5(H):1(V) WHERE SLOPE LENGTH BETWEEN 12 AND 16 METRES.
   c. 3(H):1(V) WHERE SLOPE LENGTH BETWEEN 16 AND 20 METRES.
   d. 4(H):1(V) WHERE SLOPE LENGTH GREATER THAN 20 METRES.

2. ALL WATERWAYS, DRAINS, SPILLWAYS AND THEIR OUTLETS WILL BE CONSTRUCTED TO BE STABLE IN AT LEAST THE 1:20 YEAR ARI, TIME OF CONCENTRATION STORM EVENT.

3. WATERWAYS AND OTHER AREAS SUBJECT TO CONCENTRATED FLOWS AFTER CONSTRUCTION ARE TO HAVE A MAXIMUM GROUNDCOVER C-FACTOR OF 0.05 (70% GROUND COVER) WITHIN 10 WORKING DAYS FROM COMPLETION OF FORMATION. FLOW VELOCITIES ARE TO BE LIMITED TO THOSE SHOWN IN TABLE 5-1 OF "MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION", DEPT OF HOUSING 2004 (BLUE BOOK). FOOT AND VEHICULAR TRAFFIC WILL BE PROHIBITED IN THESE AREAS.

4. STOCKPILES AFTER CONSTRUCTION ARE TO HAVE A MAXIMUM GROUND-COVER C-FACTOR OF 0.1 (60% GROUND-COVER) WITHIN 10 WORKING DAYS FROM COMPLETION OF FORMATION.

5. ALL LANDS, INCLUDING WATERWAYS AND STOCKPILES, DURING CONSTRUCTION ARE TO HAVE A MAXIMUM GROUND-COVER C-FACTOR OF 0.15 (50% GROUND COVER) WITHIN 20 WORKING DAYS FROM INACTIVITY EVEN THOUGH WORKS MAY CONTINUE LATER.

6. FOR AREAS OF SHEET FLOW USE THE FOLLOWING GROUND COVER PLANT SPECIES FOR TEMPORARY COVER: JAPANESE MILLET 20 KG/HA AND OATS 20 KG/HA.

7. PERMANENT REHABILITATION OF LANDS AFTER CONSTRUCTION WILL ACHIEVE A GROUND-COVER C-FACTOR OF LESS THAN 0.1 AND LESS THAN 0.05 WITHIN 60 DAYS. NEWLY PLANTED LANDS WILL BE WATERED REGULARLY UNTIL AN EFFECTIVE COVER IS ESTABLISHED AND PLANTS ARE GROWING VIGOROUSLY. FOLLOW-UP SEED AND FERTILISER WILL BE APPLIED AS NECESSARY.

8. RE-VEGETATION SHOULD BE AIMED AT RE-ESTABLISHING NATURAL SPECIES. NATURAL SURFACE SOILS SHOULD BE REPLACED AND NON-PERSISTANT ANNUAL COVER CROPS SHOULD BE USED.

WASTE CONTROL INSTRUCTIONS

1. ACCEPTABLE BINS WILL BE PROVIDED FOR ANY CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHING, LIGHTWEIGHT WASTE MATERIALS AND LITTER. CLEARANCE SERVICES WILL BE PROVIDED AT LEAST WEEKLY. DISPOSAL OF WASTE WILL BE IN A MANNER APPROVED BT THE PRINCIPAL'S REPRESENTATIVE.

2. ALL POSSIBLE POLLUTANT MATERIALS ARE TO BE STORED WELL CLEAR OF ANY POORLY DRAINED AREAS, FLOOD PRONE AREAS, STREAMBANKS, CHANNELS AND STORMWATER DRAINAGE AREAS. STORE SUCH MATERIALS IN A DESIGNATED AREA UNDER COVER WHERE POSSIBLE AND WITHIN CONTAINMENT BUNDS.

3. ALL SITE STAFF AND SUB-CONTACTORS ARE TO BE INFORMED OF THEIR OBLIGATION TO USE WASTE CONTROL FACILITIES PROVIDED.

4. ANY DE-WATERING ACTIVITIES ARE TO BE CLOSELY MONITORED TO ENSURE THAT WATER IS NOT POLLUTED BY SEDIMENT, TOXIC MATERIALS OR PETROLEUM PRODUCTS.

5. PROVIDE DESIGNATED VEHICULAR WASHDOWN AND MAINTENANCE AREAS WHICH ARE TO HAVE CONTAINMENT BUNDS.

North

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by: Approver

Issue.	Description	Date	Drawn	Approved
0	ISSUED FOR INFORMATION	10.02.2023	JE	SN
1	ISSUED FOR INFORMATION	17.05.2023	AL	SN
2	50% ISSUE	16.06.2023	PC	SN
3	100% ISSUE	06.09.2023	MD	SN

-1 0 1m at full size 250m

Client
HEALTH INFRASTRUCTURE

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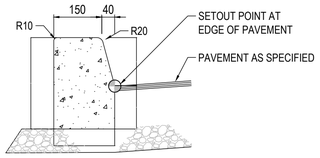
ENGINEERS |MANAGERS |INFRASTRUCTURE PLANNERS |DEVELOPMENT CONSULTANTS

Drawing Title
ENABLING WORKS CONSTRUCTION NOTES

Drawn	Date	Scale	Q.A. Check	Date
MD	06/09/2023	1:250 A1	SC	06/09/2023

Designed	Project No.	Dwg No.	Issue
SN	221192	0111	3

Autodesk Docs://CNC Health Translation North-ACOR.rvt
29/11/2022 11:42:08 AM



KERB ONLY (KO)

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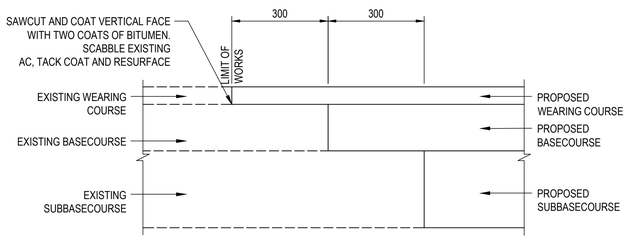

FULL DEPTH AC PAVEMENT CONNECTION TO EXISTING PAVEMENT

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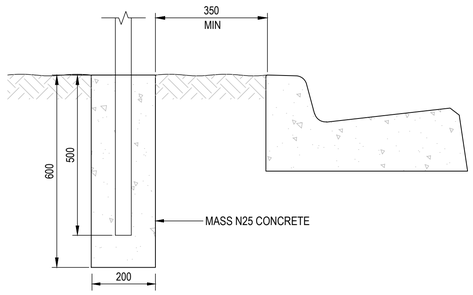

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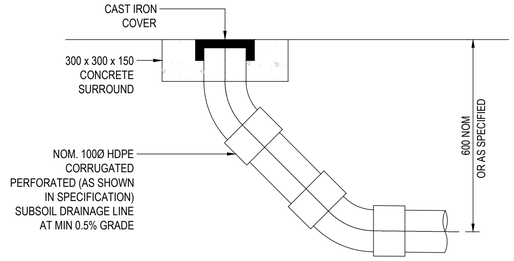
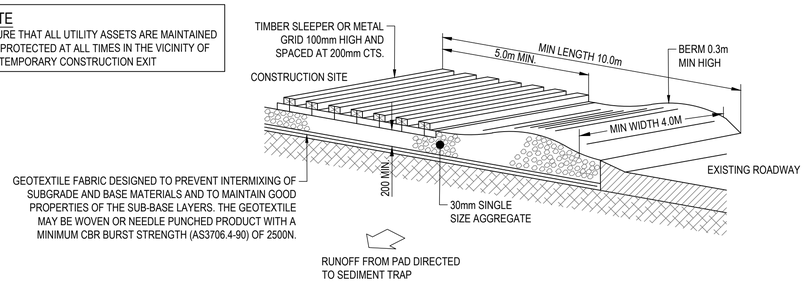


HIGH END RISER - HER

SCALE 1:10

NOTE
ENSURE THAT ALL UTILITY ASSETS ARE MAINTAINED AND PROTECTED AT ALL TIMES IN THE VICINITY OF THE TEMPORARY CONSTRUCTION EXIT



CONSTRUCTION NOTES

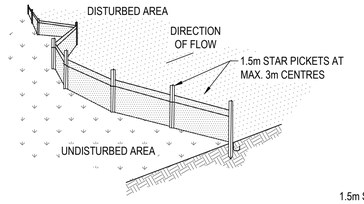
1. STRIP TOPSOIL AND LEVEL SITE.
2. COMPACT SUBGRADE.
3. COVER AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
4. CONSTRUCT 200mm THICK PAD OVER GEOTEXTILE USING 30mm SINGLE SIZE AGGREGATE.
5. CONSTRUCT HUMP IMMEDIATELY WITHIN BOUNDARY TO DIVERT WATER TO A SEDIMENT FENCE OR OTHER SEDIMENT TRAP WHERE THE SEDIMENT IS COLLECTED AND REMOVED.

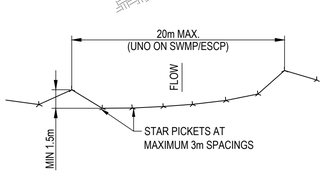
MAINTENANCE NOTES

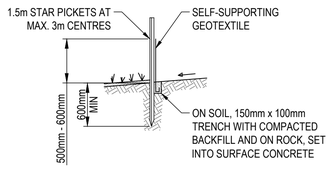
THE EXIT SHALL BE MAINTAINED IN A CONDITION WHICH PREVENTS TRACKING OR FLOWING OF SEDIMENT OFF THE CONSTRUCTION SITE. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL GRAVEL AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED OFF THE CONSTRUCTION SITE MUST BE REMOVED IMMEDIATELY.

TEMPORARY STABILISED CONSTRUCTION EXIT

N.T.S.







SECTION DETAIL

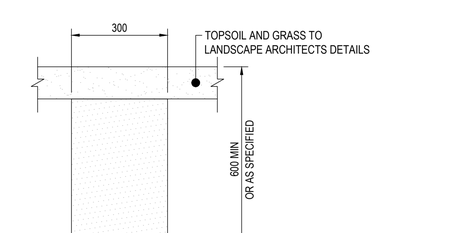
CONSTRUCTION NOTES

1. CONSTRUCT SEDIMENT FENCE AS CLOSE AS POSSIBLE TO PARALLEL TO THE CONTOURS OF THE SITE.
2. DRIVE 1.5m LONG STAR PICKETS INTO GROUND, 3 METRES APAR
3. DIG A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
4. BACKFILL TRENCH OVER BASE OF FABRIC.
5. FIX SELF-SUPPORTING GEOTEXTILE TO UPSLOPE SIDE OF POSTS WITH WIRE TIES OR AS RECOMMENDED BY GEOTEXTILE MANUFACTURER.
6. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.

PLAN

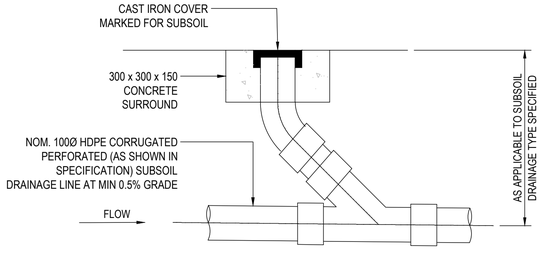
SEDIMENT CONTROL FENCE

N.T.S.



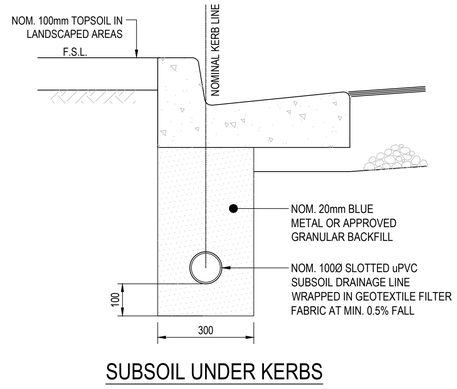
SUBSOIL DRAINAGE - TYPICAL

SCALE 1:10



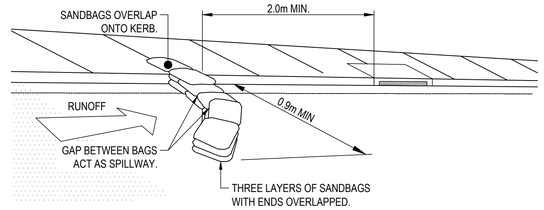
INTERMEDIATE RISER - IO

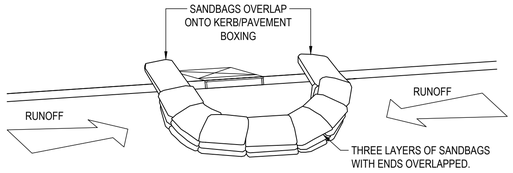
SCALE 1:10



SUBSOIL UNDER KERBS

SCALE 1:10



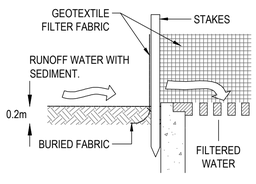


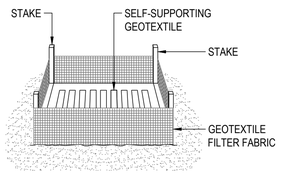
SANDBAG SEDIMENT TRAP - AT ON GRADE PIT

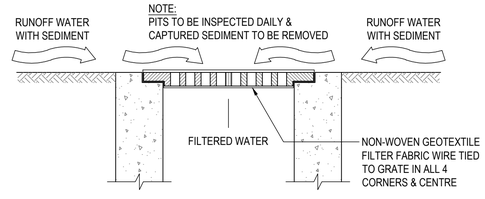
SANDBAG SEDIMENT TRAP - AT KERB SAG PIT

SANDBAG SEDIMENT TRAP.

N.T.S.







GEOTEXTILE FILTER FABRIC DROP INLET SEDIMENT TRAP.

N.T.S.

INLET TRAP

N.T.S.

NOTE
TO BE USED IN PAVED AREAS WHERE TRAFFIC ACCESS IS REQUIRED

North

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by: Approver

Issue.	Description	Date	Drawn	Approved
0	ISSUED FOR INFORMATION	10.02.2023	JE	SN
1	ISSUED FOR INFORMATION	17.05.2023	AL	SN
2	50% ISSUE	16.06.2023	PC	SN
3	100% ISSUE	06.09.2023	MD	SN

A1 0 1m at full size 250m

Client
HEALTH INFRASTRUCTURE

Architect
NBRS

4 Glen St,
Milsons Point, NSW 2061
(02) 9922 2344

Project
CONCORD FMH

109 Hospital Rd,
Concord,
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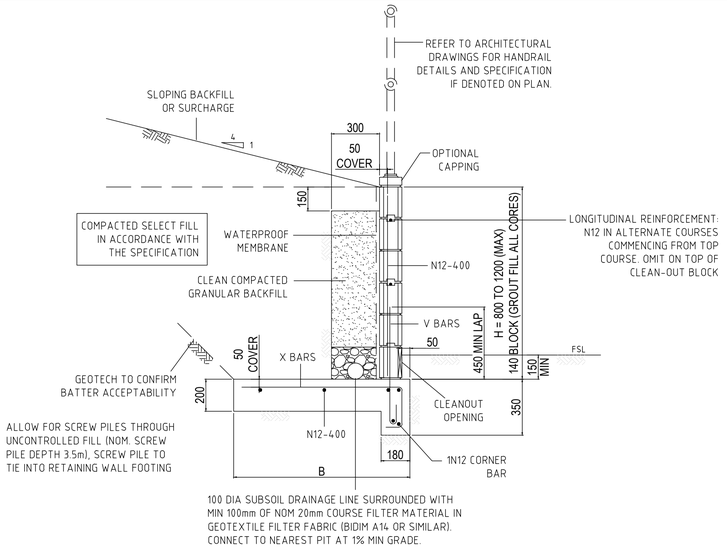
Drawing Title
ENABLING WORKS DETAILS - SHEET 1

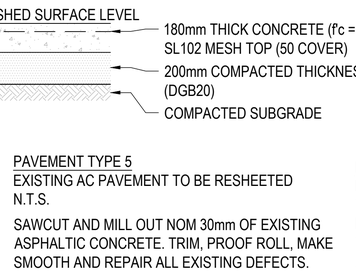
Drawn	Date	Scale A1	Q.A. Check	Date
MD	06/09/2023	AS SHOWN	SC	06/09/2023
Designed	Project No.		Dwg No.	Issue
SN	221192		0115	3

Autodesk Docs://221192 Health Transition Hub/HTH-ACO-ST-V.rvt
25/11/2022 11:42:08 AM



RW - BLOCK RETAINING WALL (MAX 1200 HIGH)

SCALE 1:20

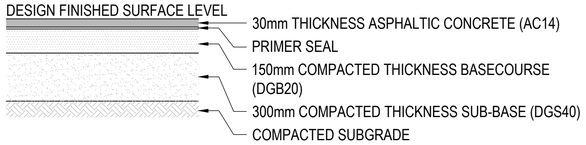


TYPICAL RETAINING WALL FOOTING STEP

BLOCK RETAINING WALL BASE							
WALL HEIGHT				REINFORCEMENT		BASE DIMENSIONS	
TOTAL HEIGHT (mm) H	HEIGHT OF BLOCKWORK			X-BARS AND V-BARS	K-BARS	WIDTH, B (mm) WITH FOLLOWING BACKFILL CONDITIONS	
	150 SERIES	200 SERIES	300 SERIES			LEVEL	MAX 1:4 SLOPE
800	800	-	-	N12-400	-	800	1000
1000	1000	-	-	N12-400	-	1000	1200

PAVEMENT TYPE 1
HEAVY DUTY AC PAVEMENT
N.T.S

DESIGN FINISHED SURFACE LEVEL



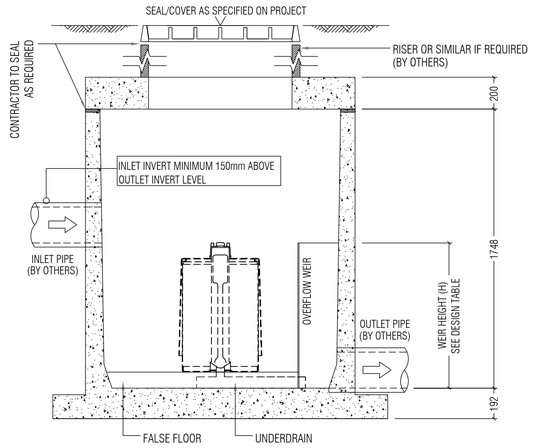
PAVEMENT TYPE 3
HEAVY DUTY CONCRETE PAVEMENT
N.T.S.

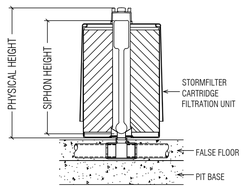
DESIGN FINISHED SURFACE LEVEL

PAVEMENT TYPE 5
EXISTING AC PAVEMENT TO BE RESHEETED
N.T.S.

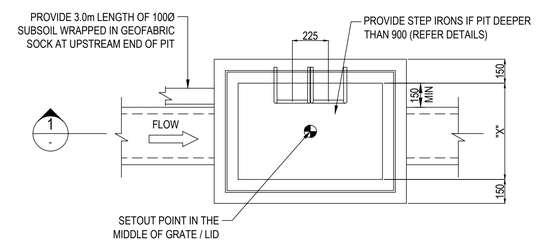
SAWCUT AND MILL OUT NOM 30mm OF EXISTING ASPHALTIC CONCRETE. TRIM, PROOF ROLL, MAKE SMOOTH AND REPAIR ALL EXISTING DEFECTS. REPLACE WITH NOM 30mm AC10

NOTE:
PAVEMENT AS SHOWN "EXISTING AC PAVEMENT TO BE RESHEETED" WILL BE REQUIRED TO BE BORE HOLED AND TESTED TO ASCERTAIN PAVEMENT CONDITION. CONTRACTOR IS TO ALLOW FOR PAVEMENT TO BE REMOVED AND REPLACED WITH NEW HEAVY DUTY PAVEMENT AC PAVEMENT TYPE 1, SUBJECT TO RESULTS OF BORE HOLE TESTING





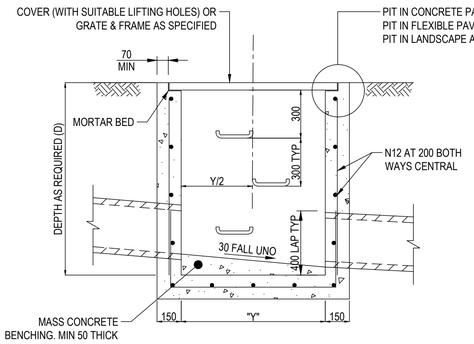
STORMFILTER CARTRIDGE DETAIL



PLAN

SURFACE INLET/JUNCTION PIT TYPE "A"

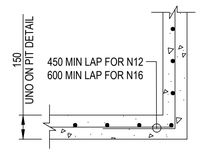
SCALE 1:20



SECTION 1 / - SCALE 1:20

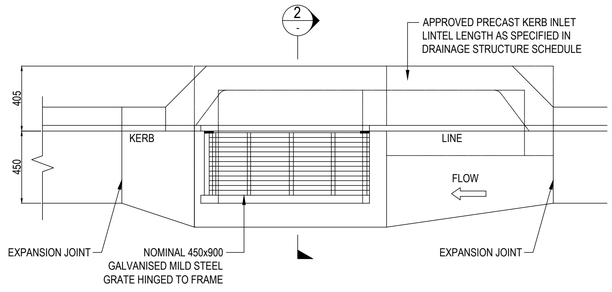
MINIMUM INTERNAL PIT DIMENSIONS		
"D"	"X"	"Y"
D ⩽ 600	450	450*
D ⩽ 900	600	600*
D ⩽ 1200	600	900
D > 1200	900	900

NOTE
PITS DENOTED * SHALL BE USED ONLY WHERE SPECIFIED IN DRAINAGE SCHEDULE OR ON PLAN.



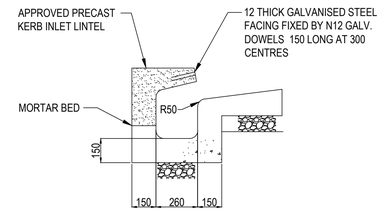
TYPICAL PIT CORNER DETAIL

SCALE 1:20



KERB INLET PIT TYPE "B" PLAN

SCALE 1:20



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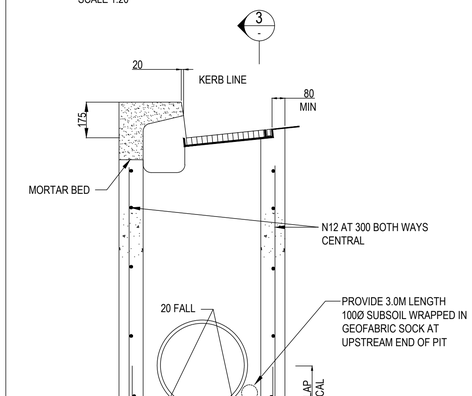

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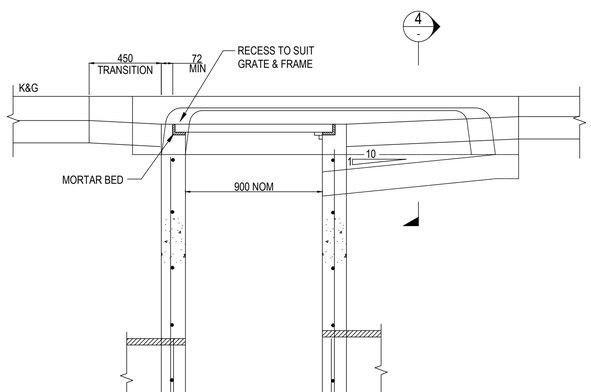

SECTION 3 / - SCALE 1:20

North

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Issue.	Description	Date	Drawn	Approved
0	50% ISSUE	16.06.2023	PC	SN
1	100% ISSUE	06.09.2023	MD	SN

0 1m at full size 250m

Client
HEALTH INFRASTRUCTURE

Architect
NBRS

4 Glen St,
Milsons Point, NSW 2061
(02) 9922 2344

Project
CONCORD FMH

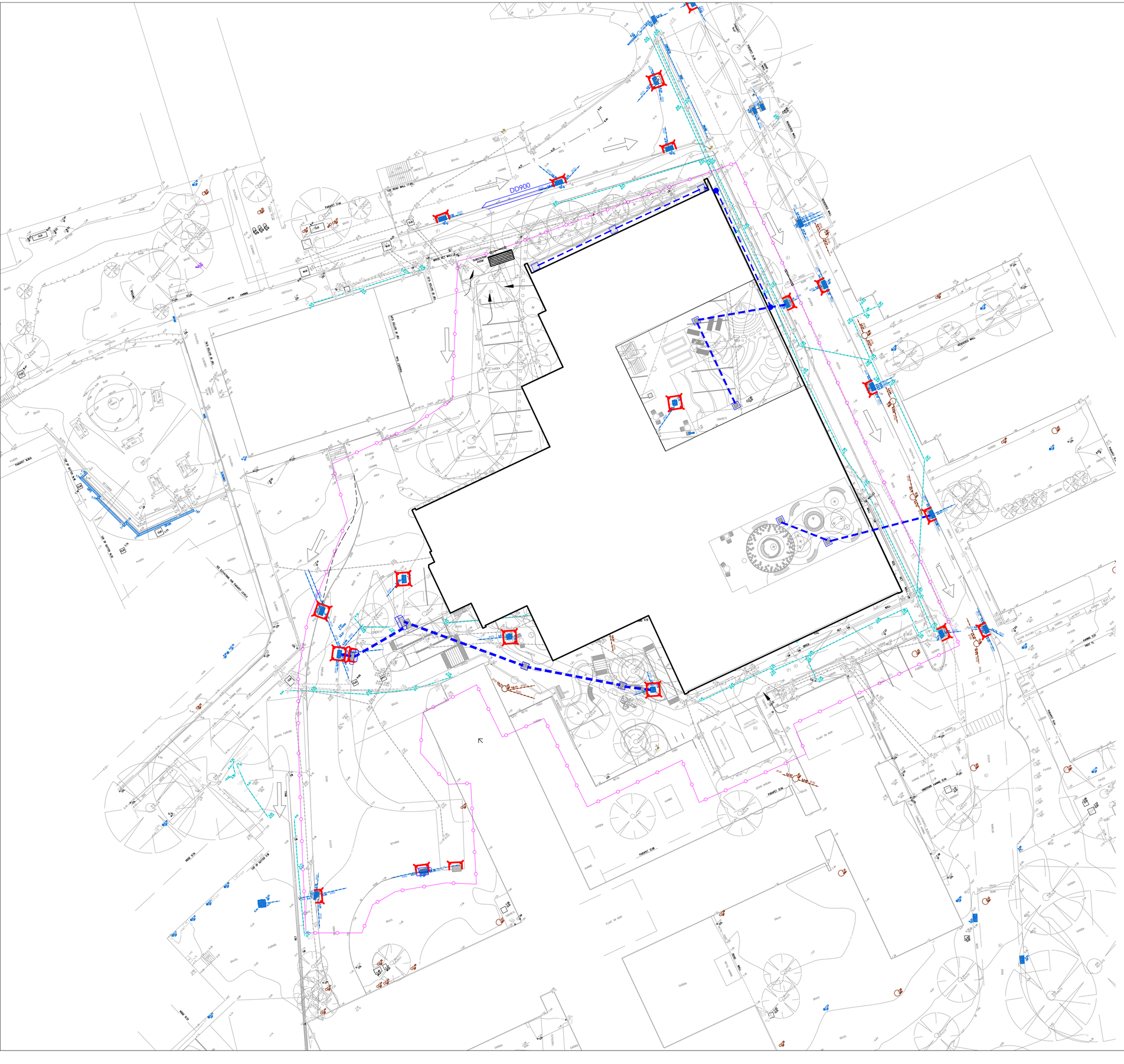
109 Hospital Rd,
Concord,
NSW 2139

ACOR Consultants Pty Ltd
Suite 2, Level 1, 33 Herbert Street
St Leonards NSW 2065
T +61 2 9438 5098
ENGINEERS |MANAGERS |INFRASTRUCTURE PLANNERS |DEVELOPMENT CONSULTANTS

Drawing Title
ENABLING WORKS DETAILS - SHEET 2

Drawn	Date	Scale A1	Q.A. Check	Date
MD	06/09/2023	AS SHOWN	MD	06/09/2023
Designed	Project No.		Dwg No.	Issue
SN	221192		0116	1

Autodesk Docs://SC122 Health Transition Hub/HTH-ACO-ST-V.rvt
25/11/2022 11:42:08 AM



North

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Issue.	Description	Date	Drawn	Approved
0	ISSUED FOR INFORMATION	10.02.2023	JE	SN
1	ISSUED FOR INFORMATION	17.05.2023	AL	SN
2	50% ISSUE	16.06.2023	PC	SN
3	100% ISSUE	06.09.2023	MD	SN

SOIL AND WATER MANAGEMENT LEGEND

- GEOTEXTILE PIT FILTER / SEDIMENT SANDBAG TRAP INSTALLED ON EXISTING PIT
- OVERLAND FLOW
- SEDIMENT FENCE / HOARDING
- SITE ACCESS GATE
- TEMPORARY SHAKER RAMP FOR ENTRY/EXIT

SURVEY LEGEND

- x 24.50 — EX SURFACE LEVEL
- 5.00 — EX SURFACE CONTOUR
- EX TREE TO BE RETAINED. REFER TO LANDSCAPE AND ARBORIST REPORT FOR DETAILS.
- EX TREE TO BE REMOVED REFER TO LANDSCAPE AND ARBORIST REPORT FOR DETAILS.
- EXISTING STORMWATER DRAINAGE LINE
- EXISTING SEWER LINE
- EXISTING WATER MAIN
- EXISTING STORMWATER PIT

0 5 1m at full size 250m

Client
HEALTH INFRASTRUCTURE

Architect
NBRS

4 Glen St,
Milsons Point, NSW 2061
(02) 9922 2344

Project
CONCORD FMH

109 Hospital Rd,
Concord,
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Suite 2, Level 1, 33 Herbert Street
St Leonards NSW 2065
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ENGINEERS |MANAGERS |INFRASTRUCTURE PLANNERS |DEVELOPMENT CONSULTANTS

Drawing Title
SEDIMENT AND EROSION CONTROL PLAN

Drawn	Date	Scale A1	Q.A. Check	Date
MD	06/09/2023	1:250	SC	06/09/2023
Designed	Project No.		Dwg No.	Issue
SN	221192		0450	3

Autodesk Docs://SC152 Health Transaction Hub/TH-ACO-ST-XX-M3-C-0450.rvt
25/11/2022 11:42:08 AM

TRANSITION FROM KG TO FLUSH AT FOOTPATH TO ALLOW FOR PEDESTRIAN MOVEMENT. PROVIDE PEDESTRIAN CROSSING SIGNAGE.

RECONSTRUCT FOOTPATH TO GRADE TO NEW ROAD

DD900

I/O

UIL 6.92
DIL 6.35
Ø150@3.1%

UIL 7.04
DIL 6.92
Ø150@1%

I/O

HOB UP TO 200mm HIGH

UIL 6.51
DIL 6.33
Ø225@1.5%

UIL 7.15
DIL 7.04
Ø150@1%

RETAINING WALL UP TO 700mm HIGH

PROVIDE CRASH BARRIER TO PROTECT BUILDING

STORMWATER UNDER EXISTING WATER MAIN & POWER

UIL 7.00
DIL 6.88
Ø225@1%

BATTER SHOWN INDICATIVELY ONLY

STORMWATER FILTER CARTRIDGE CHAMBER PIT
APPROXIMATE 30m TO CARTRIDGES, FALL AT 0.3m AT 1.5%.
INVERT RL 6,35 APPROX. TO PROVIDE COVER. DROP FOR CARTRIDGES WILL BE OKAY AS DOWNSTREAM INVERT IS SIGNIFICANTLY LOWER.

UIL 7.00
DIL 6.70
Ø225@4.65%

STORMWATER UNDER EXISTING GAS & COMMS

DEMOLISH EXISTING KERB INLET PIT AND CONSTRUCT NEW CLASS D KERB INLET PIT. CONNECT TO EXISTING

UIL 5.14
DIL 4.97
Ø300@1%

UIL 5.26
DIL 5.14
Ø300@1%

UIL 6.65
DIL 6.07
Ø225@4.24%

STORMWATER UNDER EXISTING WATER & POWER

DEMOLISH AND RECONSTRUCT EXISTING PIT AS CLASS D JUNCTION PIT. CONSTRUCT NEW CLASS D KERB INLET PIT.

UIL 5.30
DIL 5.26
Ø300@1.2%

DOWNTURN/DEEP EDGE BEAM TO STRUCTURE. EDGE BEAM TO EXTEND BELOW EXTERNAL CONCRETE PAVEMENT.

EXISTING INVERT RL 4.91

UIL 4.97
DIL 4.95
Ø300@0.27%

CONCRETE PAVEMENT FOR SUBSTATION ACCESS.

UIL 4.95
DIL 4.93
Ø300@1.5%

RAINWATER TANK LOCATION TO BE CONFIRMED. TO HYDRAULIC'S ENGINEERS DRAWINGS.

RECONSTRUCT EXISTING PIT AS CLASS D JUNCTION PIT

DEMOLISH AND RECONSTRUCT EXISTING PIT AS CLASS D KERB INLET PIT

LEGEND:

- PAVEMENT TYPE 1 FULL DEPTH
- PAVEMENT TYPE 2 MILL AND RE-SHEET
- LANDSCAPE AREA COURTYARD
- PAVING / LANDSCAPE TO LANDSCAPE ARCHITECT DETAILS
- PAVEMENT TYPE 3 HEAVY DUTY CONCRETE
- 8.00 DESIGN SURFACE LEVEL
- EX8.36 EXISTING SURFACE LEVEL
- IK 6.70 INVERT OF KERB LEVEL
- TK6.55 TOP OF KERB LEVEL
- TW8.65 TOP OF RETAINING WALL
- TH8.70 TOP OF HOB
- KO CONSTRUCT NEW KERB ONLY
- KG CONSTRUCT NEW KERB & GUTTER
- INSTALL NEW STORMWATER PIT
- INSTALL NEW STORMWATER KERB INLET PIT
- INSTALL NEW STORMWATER PIPE
- SS INSTALL SUBSOIL DRAINAGE
- DD CONSTRUCT NEW DISH DRAIN
- CONSTRUCT NEW HOB
- RW CONSTRUCT NEW RETAINING WALL
- I/O INSPECTION OPENING

North

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Issue.	Description	Date	Drawn	Approved
0	ISSUED FOR INFORMATION	10.02.2023	JE	SN
1	ISSUED FOR INFORMATION	17.05.2023	AL	SN
2	50% ISSUE	16.06.2023	PC	SN
3	50% ISSUE	17.06.2023	PC	SN
4	50% ISSUE	11.08.2023	MD	SN
5	100% ISSUE	06.09.2023	MD	SN

1:1 0 1m at full size 250m

Client
HEALTH INFRASTRUCTURE

Architect
NBRS

4 Glen St,
Milsons Point, NSW 2061
(02) 9922 2344

Project
CONCORD FMH

109 Hospital Rd,
Concord,
NSW 2139

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Suite 2, Level 1, 33 Herbert Street
St Leonards NSW 2065
T +61 2 9438 5098

ENGINEERS |MANAGERS |INFRASTRUCTURE PLANNERS |DEVELOPMENT CONSULTANTS

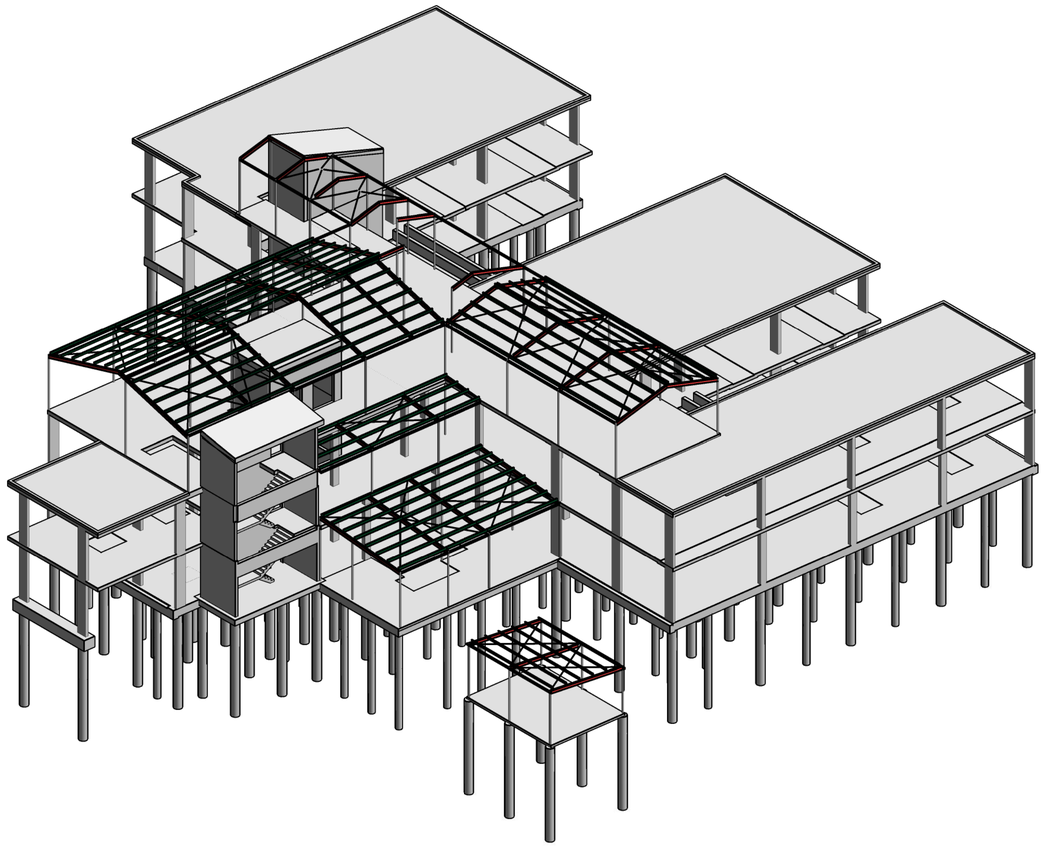
Drawing Title
SITE WORKS AND STORMWATER PLAN

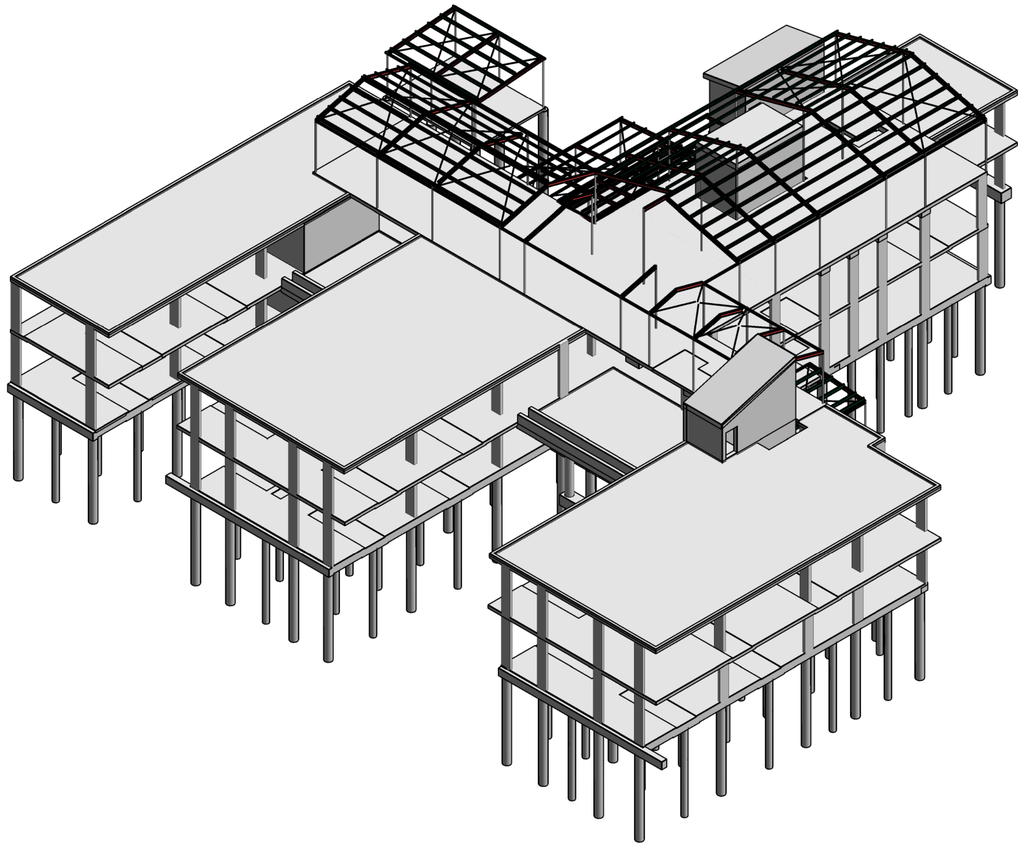
Drawn	Date	Scale A1	Q.A. Check	Date
MD	06/09/2023	1:250	SC	06/09/2023
Designed	Project No.	Dwg No.	Issue
SN	B-ACO-CEC	1000	5

Autodesk Docs://2103 Health Translation Hub/R19 ACO-ST.rvt
25/11/2022 11:42:08 AM

Appendix C - Structural 100% Design Development

CONCORD REPATRIATION GENERAL HOSPITAL
109 HOSPITAL ROAD, NSW 2139
STRUCTURAL SERVICES





DRAWING LIST	
DRAWING №	DRAWING TITLE
S-00.00	COVER SHEET
S-00.01	NOTES - SHEET 1
S-00.02	NOTES - SHEET 2
S-00.03	NOTES - SHEET 3
S-02.00	CORE WALL PART PLANS AND ELEVATIONS - SHEET 1
S-02.01	CORE WALL PART PLANS AND ELEVATIONS - SHEET 2
S-02.10	TYPICAL CONCRETE WALL DETAILS - SHEET 1
S-02.11	TYPICAL CONCRETE WALL DETAILS - SHEET 1
S-03.00	TYPICAL STAIR DETAILS - SHEET 1
S-05.00	TYPICAL FOOTING DETAILS - SHEET 1
S-05.01	TYPICAL FOOTING DETAILS - SHEET 2
S-06.00	FOOTING OVERALL PLAN
S-06.01	FOOTING GA PLAN - PART 1
S-06.02	FOOTING GA PLAN - PART 2
S-07.00	GROUND FLOOR OVERALL PLAN
S-07.01	GROUND FLOOR GA PLAN - PART 1
S-07.02	GROUND FLOOR GA PLAN - PART 2
S-07.10	LEVEL 1 OVERALL PLAN
S-07.11	LEVEL 1 GA PLAN - PART 1
S-07.12	LEVEL 1 GA PLAN - PART 2
S-07.20	LEVEL 2 OVERALL PLAN
S-07.21	LEVEL 2 GA PLAN - PART 1
S-07.22	LEVEL 2 GA PLAN - PART 2
S-07.30	ROOF OVERALL PLAN
S-07.31	ROOF GA PLAN - PART 1
S-07.32	ROOF GA PLAN - PART 2
S-13.01	TYPICAL SUSPENDED SLAB DETAILS - SHEET 1
S-14.00	TYPICAL STEEL DETAILS - SHEET 1
S-14.01	TYPICAL STEEL DETAILS - SHEET 2

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ENGINEERS | MANAGERS | INFRUSTUCTURE PLANNERS | DEVELOPMENT CONSULTANTS

Issue

No.	Date	Description	Chkd
1	13.02.2023	SCHEMATIC DESIGN	ZP
2	15.06.2023	50% DESIGN DEVELOPMENT	TB
3	15.09.2023	80% DESIGN DEVELOPMENT	TB
4	22.09.2023	100% DESIGN DEVELOPMENT DRAFT ISSUE	TB

THESE DRAWINGS REPRESENT 100% DETAILED DESIGN OPTION ONLY

Arcitect
NBRS
+61 2 9922 2344 nbrs.com.au
Nominated Architect:
Andrew Duffin NSW 5602
NBRS & Partners Pty Ltd VIC 51197 ABN 16 002 247 565

Client
NSW GOVERNMENT Health Infrastructure

Project
CONCORD REPATRIATION GENERAL HOSPITAL
at
109 HOSPITAL ROAD, NSW 2139

for
NSW GOVERNMENT HEALTH & INFRUSTRUCTURE

Drawing Title
COVER SHEET

Date 25/09/2023 6:21:29 AM
Scale @ A1

Drawing Reference
22071-S-00.00

Revision
4

GENERAL NOTES

G1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL AND OTHER CONSULTANTS DRAWINGS, SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ANY DISCREPANCY SHALL BE REFERRED TO THE STRUCTURAL ENGINEER BEFORE PROCEEDING WITH THE WORK.

G2. DO NOT COMMENCE CONSTRUCTION USING THESE STRUCTURAL DRAWINGS UNTIL A CONSTRUCTION CERTIFICATE IS ISSUED BY THE PRINCIPLE AUTHORITY.

G3. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE RELEVANT CURRENT STANDARDS AUSTRALIA CODES AND WITH THE BUILDING CODE OF AUSTRALIA.

G4. ALL DIMENSIONS RELEVANT TO SETTING OUT AND OFF-SITE WORK SHALL BE VERIFIED BY THE CONTRACTOR BEFORE CONSTRUCTION AND FABRICATION IS COMMENCED

G5. DIMENSIONS SHALL NOT BE OBTAINED BY SCALING THE STRUCTURAL DRAWINGS.

G6. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE. ALL LEVELS ARE EXPRESSED IN METRES. THE RL'S SHOWN ON THESE DRAWINGS ARE FOR THE SOLE PURPOSE OF ASSISTING THE STRUCTURAL DOCUMENTATION. THEY MUST NOT BE USED FOR CONSTRUCTION. REFER TO THE ARCHITECT'S DRAWINGS FOR ALL CONSTRUCTION RL'S.

G7. DURING CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE STRUCTURE IN A STABLE CONDITION AND ENSURING NO PART SHALL BE OVER STRESSED UNDER CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL PROVIDE TEMPORARY BRACING, SHORING AND PROPPING IN ORDER TO KEEP THE BUILDING WORKS AND EXCAVATIONS STABLE AT ALL TIMES.

G8. THE BUILDER IS RESPONSIBLE FOR THE ADEQUACY OF ALL TEMPORARY WORKS INCLUDING SHORING, PROPPING AND BRACING. WHERE NECESSARY THE CONTRACTOR IS TO ENGAGE A STRUCTURAL ENGINEER TO DESIGN AND CERTIFY THE TEMPORARY WORKS

G9. THE METHOD OF CONSTRUCTION AND THE MAINTENANCE OF SAFETY DURING CONSTRUCTION ARE THE RESPONSIBILITY OF THE BUILDER. IF ANY STRUCTURAL ELEMENT PRESENTS DIFFICULTY IN RESPECT OF CONSTRUCTABILITY OR SAFETY, THE MATTER SHALL BE REFERRED TO THE STRUCTURAL ENGINEER FOR RESOLUTION BEFORE PROCEEDING WITH THE WORK.

G10. IF THERE IS A DISCREPANCY IN MEMBER SIZES FOR ANY COMPONENT, ASSUME FOR PRICING PURPOSE ONLY THAT THE LARGER OR MORE EXPENSIVE SIZE IS CORRECT. REFER TO STRUCTURAL ENGINEER FOR DECISION BEFORE DETAILING OR CONSTRUCTION.

G11. THE APPROVAL OF A SUBSTITUTION SHALL BE SOUGHT FROM THE ENGINEER BUT IS NOT AN AUTHORISATION FOR A VARIATION. ANY VARIATIONS INVOLVED MUST BE TAKEN UP WITH THE ARCHITECT OR PROJECT MANAGER BEFORE THE WORK COMMENCES.

G12. ANY DISCREPANCIES OR OMISSIONS SHALL BE REFERRED TO THE ENGINEER FOR A DECISION BEFORE PROCEEDING WITH THE WORK

G13. THE WRITTEN CONSENT OF ADJOINING PROPERTY OWNERS SHALL BE OBTAINED BEFORE INSTALLATION OF UNDERPINNING, ANCHORING WORKS, DRAINAGE LINES OR ANY OTHER WORKS BEYOND THE PROPERTY BOUNDARY.

G14. UNLESS AGREED OR SPECIFIED OTHERWISE, THE BUILDER IS REQUIRED TO NOTIFY AND ALLOW TIME FOR THE STRUCTURAL ENGINEER TO INSPECT THE WORKS AT THE FOLLOWING POINTS, COMPLETED EXCAVATION, FORMWORK, REINFORCEMENT, MEMBRANES AND EMBEDMENT'S PRIOR TO PLACEMENT OF CONCRETE, COMPLETED ERECTED STRUCTURAL ELEMENTS PRIOR TO COVERING

G15. THE BUILDER SHALL GIVE 48 HOURS NOTICE FOR ALL ENGINEERING INSPECTIONS.

G16. SITE INSPECTIONS DO NOT RELIEVE THE BUILDER OF RESPONSIBILITY FOR THE COMPLETENESS AND CORRECTNESS OF THEIR WORK.

G17. WHERE STRUCTURAL ELEMENTS ARE DESIGNED AND CERTIFIED BY OTHER PARTIES, THE CONTRACTOR SHALL OBTAIN WRITTEN CERTIFICATION PRIOR TO PROCEEDING WITH ANY CONSTRUCTION WORK WHICH WOULD PREVENT INSPECTION OR REMEDIAL WORKS TO BE UNDERTAKEN. ALL CERTIFICATIONS ARE TO BE ISSUED TO THE STRUCTURAL ENGINEER FOR REVIEW PRIOR TO WORK PROCEEDING.

G18. THE WORD 'ENGINEER' USED IN THESE NOTES REFERS TO AN EMPLOYEE OR NOMINATED REPRESENTATIVE OF ACOR CONSULTANTS PTY.LTD.

FOUNDATIONS

F1. BEARING MATERIAL AT BASES OF PIERS TO BE CONFIRMED BY AN EXPERIENCED GEOTECHNICAL ENGINEER OR ENGINEERING GEOLOGIST.

F2. EXCAVATION NEAR FOOTINGS SHALL NOT EXTEND BELOW FOUNDATION LEVEL WITHOUT THE ENGINEERS APPROVAL.

F3. ALL FOOTINGS SHALL BE LOCATED CENTRALLY UNDER WALLS AND COLUMNS UNLESS NOTED OTHERWISE

F4. DO NOT BACKFILL RETAINING WALLS (OTHER THAN CANTILEVER WALLS) UNTIL FLOOR CONSTRUCTION AT TOP AND BOTTOM IS COMPLETED.

F5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ANY EXCAVATION IN A STABLE CONDITION WITHOUT ADVERSELY AFFECTING SURROUNDING PROPERTY INCLUDING SERVICES. THIS INCLUDES OBTAINING ALL NECESSARY APPROVALS FOR SHORING AND ANCHOR SYSTEMS.

F6. ANY OVER EXCAVATION SHALL BE BACKFILLED WITH CONCRETE GRADE N15.

F7. FOUNDATIONS ADJACENT TO SERVICES ETC. SHALL BE EXTENDED DOWN SUCH THAT THE INFLUENCE LINE OF THE FOUNDATION IS BELOW THE ADJACENT SERVICE.

F8. ALL PILES TO BE FOUNDED INTO SANDSTONE CLASS IV TO LIMIT DIFFERENTIAL SETTLEMENT AS NOTED IN THE GEOTECHNICAL REPORT. ALL BORED HOLES TO BE INSPECTED BY A GEOTECHNICAL ENGINEER TO CONFIRM.

GEOTECH REPORT No: E25966.G03 PREPARED BY: EIAustralia

CONCRETE NOTES

C1. ALL WORKMANSHIP AND MATERIALS SHALL COMPLY WITH AS 3600 CURRENT EDITIONS WITH AMENDMENTS, EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.

C2. ALL CONCRETE SUPPLY SHALL COMPLY WITH AS1379. CONCRETE PROPERTIES AND COVER TO REINFORCING.

ELEMENT		COVER (mm)		fc (MPa) (28 DAYS)	MAX 56 DAY SHRINKAGE
BORED PILES		70		40	800
SLAB ON GROUND	EXTERNAL	T 40	B 50	32	800
	INTERNAL	T 20	B 50	32	
STRIP FOOTINGS		50		40	800
PAD FOOTINGS		50		40	800
SUSPENDED SLABS	EXTERNAL	T 40	B 40	40	650
	INTERNAL	T 20	B 20	40	
BEAMS	EXTERNAL	T	B		
	INTERNAL	T	B		
COLUMNS	EXTERNAL	40		32	800
	INTERNAL	40		32	
CONCRETE WALLS	EXTERNAL	40		40	800
	INTERNAL	20		40	
PRECAST WALLS	EXTERNAL	N/A		N/A	N/A
	INTERNAL	N/A		N/A	

MAXIMUM AGGREGATE SIZE = 20
SLUMP DURING PLACEMENT = 80
EXPOSURE CLASSIFICATION = A1 INTERNAL
= B1 EXTERNAL

C3. CEMENT TO BE TYPE SL TO AS 3972 UNLESS NOTED OTHERWISE THIS IS A MODIFIED TYPE 'GP' CEMENT. SEE ACSE CONCRETE SPECIFICATION.

C4. NO 'BRECCIA' TYPE AGGREGATE IS TO BE USED.

C5. NO ADMIXTURES SHALL BE USED IN CONCRETE UNLESS APPROVED IN WRITING BY THE ENGINEER.

C6. PROJECT ASSESSMENT OF CONCRETE SHALL BE CARRIED OUT IN ACCORDANCE WITH AS1379.

C7. PROJECT CONTROL TESTING SHALL BE CARRIED OUT IN ACCORDANCE WITH AS1379 BY A NATA REGISTERED TESTING LABORATORY. SAMPLES SHALL BE TAKEN FOR TESTING OF SLUMP, COMPRESSIVE STRENGTH AND ANY OTHER TEST SPECIFIED.

SLUMP SHALL BE SAMPLED FOR EACH TRUCK AT THE TIME OF POURING.

THE MINIMUM FREQUENCY OF SAMPLING FOR COMPRESSIVE TESTING OF EACH TYPE AND GRADE SHALL BE IN ACCORDANCE WITH THE FOLLOWING TABLE:

NUMBER OF BATCHES PER DAY	NUMBER OF SAMPLES 1 SAMPLE = 3 CYLINDERS (4 CYLINDERS FOR POST TENSIONED CONCRETE)
1	1 SAMPLE
1 TO 5	2 SAMPLES
6 TO 10	3 SAMPLES
11 TO 20	4 SAMPLES
FOR EACH ADDITIONAL 10	1 ADDITIONAL SAMPLE

SAMPLES SHALL BE TESTED FOR COMPRESSIVE STRENGTH AS FOLLOWS:
ONE CYLINDER AT 3 DAYS (POST TENSIONED CONCRETE ONLY)
ONE CYLINDER AT 7 DAYS
TWO CYLINDERS AT 28 DAYS

C8. BEAM DEPTHS ARE WRITTEN FIRST AND INCLUDE SLAB THICKNESS.

C9. SIZES OF CONCRETE ELEMENTS DO NOT INCLUDE THICKNESS OF APPLIED FINISHES.

C10. NO HOLES, CHASES OR EMBEDMENT OF PIPES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS WITHOUT PRIOR APPROVAL OF THE ENGINEER.

C11. CONSTRUCTION JOINTS SHALL BE PROPERLY FORMED AND USE ONLY WHERE SHOWN OR SPECIFICALLY APPROVED BY THE ENGINEER.

C12. ALL CONCRETE COLUMNS ARE TO BE POURED A MINIMUM OF 4 HOURS PRIOR TO SLAB OR BEAM OVER.

C13. DRIP GROOVES ARE TO BE PROVIDED AT ALL EXPOSED EDGES. COVER TO REINFORCEMENT IS TO BE MAINTAINED.

C14. CONDUITS, PIPES AND THE LIKE SHALL NOT BE PLACED WITHIN THE CONCRETE COVER

C15. ALL CONCRETE (INCLUDING FOOTINGS AND SLABS ON GROUND) SHALL BE MECHANICALLY VIBRATED TO ACHIEVE FULL COMPACTION.

C16. SAWN CUT JOINTS ARE TO BE CUT AFTER THE CONCRETE HAS SUFFICIENTLY HARDENED THAT WILL NOT BE DAMAGED BY THE SAWING BUT BEFORE SHRINKAGE CRACKING CAN OCCUR.

C17. CURING OF ALL CONCRETE SHALL BE IN ACCORDANCE WITH AS3600 AND SHALL COMMENCE WITHIN 2 HOURS OF FINISHING OPERATIONS. CURING SHALL BE BY CONTINUAL SATURATION WITH POTABLE WATER FOR 3 DAYS FOLLOWED BY PREVENTION OF MOISTURE LOSS FOR THE NEXT 4 DAYS USING POLYTHENE SHEETING OR WET HESSIAN PROTECTED FROM WIND OR TRAFFIC AND THEN ALLOWING GRADUAL DRYING OUT. CURING COMPOUNDS MAY BE USED PROVIDED THAT THEY COMPLY WITH AS3799 AND DO NOT AFFECT FLOOR FINISHES. THE COMPATIBILITY OF CURING COMPOUNDS WITH PROPOSED APPLIED FINISHES SHALL BE VERIFIED PRIOR TO APPLICATION. CURING COMPOUNDS ARE TO BE APPLIED UNIFORMLY IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION. PVA BASED CURING COMPOUNDS ARE NOT ACCEPTABLE.

C18. ALIPHATIC ALCOHOL:-
WHEN SHADE TEMPERATURE EXCEEDS 35° C SPRAY THE EXPOSED SURFACE OF CONCRETE SLAB DURING THE PLACING AND FINISHING OPERATION WITH A FINE FILM OF APPROVED ALIPHATIC ALCOHOL. REPEAT THE SPRAY IF THE SPRAYED SURFACE HAS BEEN RE-WORKED.

C19. ENSURE ADEQUATE SUPPLY OF ALIPHATIC ALCOHOL ON SITE BEFORE COMMENCING CONCRETE WORK.

CONCRETE CONT'

C20. SLIP JOINTS ARE TO BE USED ON ALL LOAD BEARING MASONRY WALLS. USE TWO LAYERS OF GALVANIZED FLAT STEEL WITH GRAPHITE GREASE BETWEEN IN INTERNAL SKIN & TWO LAYERS OF STAINLESS STEEL WITH GRAPHIC GREASE BETWEEN IN EXTERNAL SKINS. PROVIDE MORTAR LEVELLING STRIP AS REQUIRED.

C21. NON LOAD BEARING MASONRY SHALL BE SEPARATED FROM THE SOFFIT OF SLABS AND BEAMS BY 20mm.

C22. MASONRY WALLS MUST NOT BE CONSTRUCTED ON SUSPENDED CONCRETE UNTIL ALL TEMPORARY SUPPORTS ARE REMOVED AND ALL MASONRY TO BE LAID HAS BEEN STACKED ADJACENT TO PROPOSED POSITION.

TYPICAL OPENINGS IN SLABS

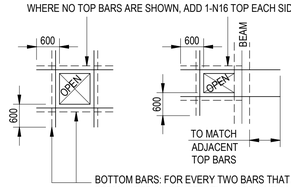
C23. LOCATION OF ALL OPENINGS TO BE TO THE APPROVAL OF ACOR.

C24. FOR OPENINGS LESS THAN 300 x 300mm BARS TO BE RE-ARRANGED AROUND HOLE.

C25. FOR PENETRATIONS GREATER THAN 300 x 300mm BUT LESS THAN 1000 x 1000mm USE DETAILS BELOW.

C26. FOR PENETRATIONS GREATER THAN 1000 x 1000mm REFER TO ENGINEER'S PLANS. WHERE OPENINGS ARE NOT DETAILED, CONTACT ENGINEER IMMEDIATELY.

C27. TOP BARS: FOR EVERY TWO BARS THAT ARE TERMINATED BY OPENINGS, ADD ONE BAR EACH SIDE USING SAME GRADE AND SIZE OF REINFORCEMENT. WHERE NO TOP BARS ARE SHOWN, ADD 1-N16 TOP EACH SIDE OF OPENING.



BOTTOM BARS: FOR EVERY TWO BARS THAT ARE TERMINATED BY PENETRATION, ADD ONE BAR EACH SIDE USING SAME GRADE AND SIZE OF REINFORCEMENT.

PIPE PENETRATION THROUGH BEAM

C28. LOCATION OF ALL OPENINGS TO BE TO THE APPROVAL OF THE STRUCTURAL ENGINEER.

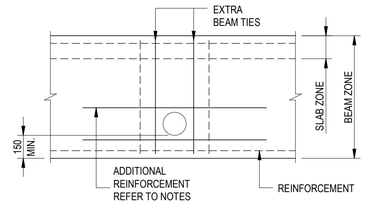
C29. MINIMUM DISTANCE FROM BEAM SOFFIT TO PIPE SOFFIT TO BE 150mm.

C30. FOR PIPES UP TO Ø90, ADD ONE ROW OF TIES EACH SIDE OF PIPE.

C31. FOR PIPES Ø91 TO Ø150, ADD TWO ROWS OF TIES EACH SIDE OF PIPE AND 1-N16 HORIZONTAL BAR 1200 LONG TOP AND BOTTOM OF PIPE AT EVERY VERTICAL TIE LEG.

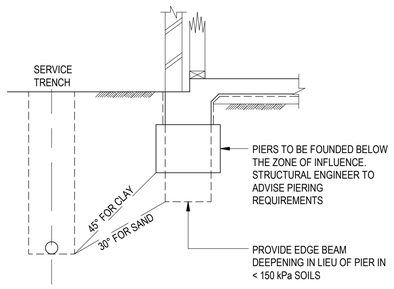
C32. FOR HOLES GREATER THAN Ø150 REFER TO ENGINEER'S DETAILS. WHERE PENETRATIONS ARE NOT DETAILED, CONTACT STRUCTURAL ENGINEER IMMEDIATELY.

C33. LOCATION OF HOLES TO BE TO THE APPROVAL OF THE STRUCTURAL ENGINEER.



PIERING REQUIREMENT

C34. WHERE A SERVICE TRENCH IS PARALLEL TO A SIDE OF THE SLAB, WHETHER THE SLAB BE IN AN EXCAVATED OR FILLED AREA, THEN PIERING TO SUPPORT THE SLAB BESIDE THE SERVICE TRENCH IS ONLY REQUIRED IF THE SERVICE LINE IS BELOW A LINE OF INFLUENCE DRAWN FROM THE BOTTOM OF THE EDGE BEAM. REFER TO DIAGRAM BELOW.



C35. THESE NOTES ARE INTENDED AS A GUIDE. THERE IS ALWAYS A POSSIBILITY OF SITE CONDITIONS REQUIRING VARIATION TO THESE PROCEDURES. IN SUCH CASES, THE STRUCTURAL ENGINEER MUST BE CONSULTED.

CONCRETE PAVEMENT NOTES

CP1. ALL WORK TO BE BROOM FINISHED.

CP2. JOINTS AS DETAILED.

CP3. A) IN CASE OF DOUBT - ASK.

B) BOND BREAKER TO BE TWO (2) UNIFORM COATS OF BITUMEN EMULSION ALL OVER THE EXPOSED SURFACE AND ON ENDS.

C) DOWELS AND TIE BARS TO MEET STRENGTH REQUIREMENTS OF STRUCTURAL GRADE STEEL IN ACCORDANCE WITH AS 1302. DOWELS AND TIE BARS SHALL BE:

- STRAIGHT
- TO LENGTH SPECIFIED
- CLEAN AND FREE FROM MILL SCALE, RUST AND OIL
- SAWN TO LENGTH NOT CROPPED

CP4. JOINT TO BE SAWN AS SOON AS CONCRETE HAS HARDENED SUFFICIENTLY THAT IT WILL NOT BE DAMAGED BY SAWING. IF AN UNPLANNED CRACK OCCURS THE CONTRACTOR SHALL REPLACE THE WHOLE SLABS EITHER SIDE OF THE CRACK, UNLESS DIRECTED OTHERWISE.

CP5. DIMENSIONS OF SEALANT RESERVOIR DEPENDENT ON THE SEALANT TYPE ADOPTED. ENGINEER'S APPROVAL TO BE OBTAINED FOR SEALANT, RESERVOIR DIMENSIONS AND DETAIL PROPOSED BY THE CONTRACTOR. REFER TO DETAILS 'A AND 'B' FOR TYPICAL ARRANGEMENT AND SEALANT.

CP6. REFER TO COMPACTING NOTES FOR PREPARATION OF SUB-BASE AND SUB-GRADE.

CONCRETE PILE NOTES

CP1. PILES SHALL COMPLY WITH AS2159 - PILING DESIGN AND INSTALLATION AND ALL OTHER RELEVANT STANDARDS AND CODES OF PRACTICE.

CP2. REFER TO LATEST GEOTECHNICAL REPORT FOR DETAIL OF SOIL CONDITIONS.

CP3. THE PILES HAVE BEEN DESIGNED FOR BOTH THE LOADS AS SHOWN ON THE DRAWINGS, AND ANY LOADS DUE TO INSTALLATION. THE DESIGN LOADS PROVIDED HAVE BEEN DETERMINED IN ACCORDANCE WITH AS1170. PILES ARE TO BE DESIGNED FOR ALL RELEVANT LOAD COMBINATIONS IDENTIFIED IN AS1170 AND AS2159-2009. THE PILES SHALL BE DESIGN TO LIMIT DIFFERENTIAL SETTLEMENT. THE ABSOLUTE DIFFERENTIAL PILE SETTLEMENT AT ANY TIME BETWEEN ANY TWO ADJACENT PILES IS NOT TO EXCEED PILE SPACING (mm) / 1000. E.G. WHERE TWO PILE ARE LOCATED 8.4m APART THE MAXIMUM ABSOLUTE DIFFERENTIAL SETTLEMENT AT ANY TIME IS 8.4mm. THE MEASURE OF PILE SETTLEMENT IS TO INCLUDE ELASTIC SHORTENING OF THE PILE.

CP4. PILE DESIGN CALCULATIONS ARE TO BE PROVIDED THAT INDICATE THE DESIGN LOADS AND ALL ASSUMED PARAMETERS. THE PILE DESIGN CALCULATIONS ARE TO BE CERTIFIED BY AN NPER STRUCTURAL OR GEOTECHNICAL ENGINEER COMPETENT IN PILE DESIGN. THESE CALCULATIONS ARE TO BE SUBMITTED TO THE STRUCTURAL AND GEOTECHNICAL ENGINEER FOR REVIEW. THIS REVIEW SHALL NOT RELIEVE THE PILING CONTRACTOR FROM ANY OBLIGATIONS AND THE PILING CONTRACTOR SHALL REMAIN COMPLETELY LIABLE FOR THE PILE WORKS. THE CONTRACTOR IS TO ALLOW FOR ANY COST AND TIME IMPLICATIONS FOR THIS REVIEW.

CP5. PILES SHALL BE CUT OFF AT THE LEVELS REQUIRED TO ACHIEVE CONSTRUCTION OF THE PILE CAPS AS INDICATED ON THE DRAWINGS. ALLOW REINFORCEMENT TO PROTRUDE INTO PILE CAPS.

CP6. SETS, PLAN LOCATION, BEARING CAPACITY REACHED AND ANY PROBLEMS ENCOUNTERED.

CP7. AT THE COMPLETION OF PILE WORKS, THE PILING CONTRACTOR IS TO ISSUE CERTIFICATION BY A REGISTERED NPER STRUCTURAL ENGINEER THAT THE INSTALLED PILES ARE SATISFACTORY TO CARRY THE DESIGN LOADS AS SHOWN ON THE DRAWINGS FOR THE SPECIFIED DESIGN LIFE OF 50 YEARS.

CP8. ALL FOUND MATERIAL SHALL BE INSPECTED, APPROVED AND CERTIFIED AT THE PILING CONTRACTORS EXPENSE BY A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF CONCRETE AND REINFORCEMENT CAGES. THE PILE CONTRACTOR SHALL CONDUCT ALL NECESSARY TESTING AS REQUIRED BY AS2159-2009 TO DEMONSTRATE THAT THE PILES ARE ABLE TO RESIST ALL LOADS NOMINATED ON THE STRUCTURAL DRAWINGS.

CP9. PILES ARE TO BE FOUNDED AT A DEPTH WHERE SUITABLE TO SATISFY STRUCTURAL DESIGN INTENT. ALL PILES TO BEAR ON SIMILAR FOUNDATION STRATA. SOCKET LENGTHS ON PILE DRAWINGS INDICATE MINIMUM EMBEDMENT INTO REQUIRED ROCK STRATA AS PER GEOTECHNICAL REPORT.

CP10. PLACING OF CONCRETE IN PILES SHALL BE IN ACCORDANCE WITH THE SPECIFICATION AND ANY REQUIREMENTS OF AS2159-2009.

CP11. CONCRETE STRENGTH AND COVER TO REINFORCING IS TO BE IN ACCORDANCE WITH AS2159-2009 AND AS3600. THE PILE DESIGNER IS TO DETERMINE ALL DURABILITY REQUIREMENTS AND DESIGN ALL PILES TO SATISFY THE REQUIREMENTS OF AS2159-2009 AND AS3600 AND THE DESIGN LIFE NOMINATED.

CP12. THE TOLERANCE ON THE INSTALLATION OF PILES SHALL BE IN ACCORDANCE WITH AS2159-2009. THE PILE & ITS CONNECTION TO THE FOOTING MUST BE DESIGNED FOR THESE CONSTRUCTION TOLERANCES & ANY ECCENTRICITIES AS A RESULT. THE STRUCTURAL ENGINEER IS TO BE NOTIFIED OF ANY PILES WHICH DO NOT SATISFY THE ABOVE CRITERIA, FOR ANY POSSIBLE FOOTING RECTIFICATION DESIGN. THE CONTRACTOR SHALL PAY FOR ANY COSTS FOR THIS REASSESSMENT, REDESIGN & CONSTRUCTION.

CP13. THE BUILDING OWNER SHOULD BE ADVISED THAT IN CARRYING OUT SHORING WORKS, IT IS VIRTUALLY IMPOSSIBLE TO ENTIRELY PREVENT ANY MOVEMENT OF THE EXCAVATION, AND THAT EXCAVATION MOVEMENT MAY LEAD TO DAMAGE TO ADJOINING PROPERTIES. IT IS RECOMMENDED THAT CONSULTING ENGINEERS, WITH THE APPROPRIATE ADVICE FROM THE GEOTECHNICAL CONSULTANT, ADVISE OWNERS OF THE POSSIBLE RISK ASSOCIATED WITH THE WORKS AND THE POTENTIAL FOR DAMAGE TO ADJOINING PROPERTIES, WHICH AY SUBSEQUENTLY NEED REPAIRS (eg. THE DAMAGE MAY BE IN THE FORM OF CRACKS THAT WOULD NEED TO BE REPAIRED AT THE DEVELOPERS EXPENSE) THIS COURSE OF ACTION IS NOT INTENDED TO BE OR APPEAR TO BE ALARMIST, BUT SIMPLY A PROPER DISCHARGE OF THE ENGINEERS RESPONSIBILITIES. THE BUILDING OWNER SHOULD BE ADVISED TO ALLOW A SUM OF MONEY AS A CONTINGENCY FOR ANY REPAIRS TO ADJOINING BUILDINGS.

CP14. CENTRE-LINE OF ALL PILES TO COINCIDE WITH CENTRE-LINE OF COLUMN U.N.O. WHERE PILES CAN NOT BE LOCATED ON THE CENTRE-LINE OF COLUMNS DUE TO AN EXISTING IN-GROUND SERVICE ETC, THE CONTRACTOR MUST NOTIFY THE ENGINEER PRIOR TO COMMENCING PILING.

REINFORCEMENT

R1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS 3600, AS4671 AND OTHER RELEVANT AUSTRALIAN CODES.

R2. REINFORCEMENT TYPE AND GRADE.

SYMBOL	TYPE	MPa	DUCTILITY CLASS
N	HOT ROLLED DEFORMED BARS	500	NORMAL
R	HOT ROLLED PLAIN BARS	250	NORMAL
W	COLD DRAWN PLAIN ROUND WIRE	500	LOW
SL	SQUARE WELDED MESH	500	LOW
RL	RECTANGULAR WELDED MESH	500	LOW
L TM	RECTANGULAR WELDED MESH	500	LOW

R3. ALL REINFORCEMENT TO CONFORM TO AS4671, CURRENT EDITIONS WITH AMENDMENTS.
REINFORCEMENT NOTATION GIVES THE FOLLOWING INFORMATION: NO. OF BARS, TYPE, SIZE (MM), SPACING (MM), LAYER.
FOR EXAMPLE 17N16 -250 T

FABRIC OR MESH NOTATION GIVES THE FOLLOWING INFORMATION: "RL" OR "SL", PRODUCT CODE, LAYER. FOR EXAMPLE SL82 T

R4. REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY AND NOT NECESSARILY SHOWN IN TRUE PROJECTION.

R5. COVER TO REINFORCEMENT - CLEAR COVER TO TO ALL REINFORCEMENT FOR DURABILITY SHALL BE AS INDICATED IN THE CONCRETE NOTES. COVER SHALL NOT BE LESS THAN THE SIZE OF THE AGGREGATE OR THE MAIN BAR. PIPES OR CONDUITS SHALL NOT BE PLACED WITHIN THE COVER TO REINFORCEMENT. ADDITIONAL COVER MAY BE REQUIRED TO ACHIEVE FIRE RATING - REFER TO DESIGN DRAWINGS.

SUPPORT REINFORCEMENT ON MILD STEEL PLASTIC TIPPED CHAIRS, PLASTIC CHAIRS OR CONCRETE CHAIRS AT NOT GREATER THAN 1 METRE CENTRES BOTH WAYS. IN EXPOSED CONDITIONS B2 OR C (TO AS3600)

USE ONLY PLASTIC OR CONCRETE CHAIRS.

R6. WELDING OF REINFORCEMENT SHALL NOT BE PERMITTED WITHOUT THE APPROVAL OF THE ENGINEER.

R7. PROVIDE DISTRIBUTION REINFORCEMENT OR TIE BARS IF NOT SHOWN. WHERE NECESSARY PROVIDE N12-400 CENTRES (SPLICE 450)

R8. SITE BENDING OF N BARS SHALL BE DONE COLD WITH POWER OR MECHANICAL BENDING TOOLS AND A MANDREL OR FORMER WITH A BAR DIAMETER OF 5 TIMES THE BAR SIZE. NOTE: IF N BARS ARE HEATED ABOVE 450°C (LESS THAN RED HEAT) THEY LOSE STRENGTH.

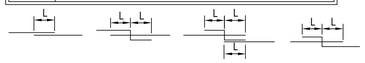
REINFORCEMENT LAPS

R9. LAP REINFORCEMENT ONLY AT LOCATIONS SHOWN ON THE STRUCTURAL DRAWINGS OR AS OTHERWISE APPROVED IN WRITING BY THE STRUCTURAL ENGINEER.

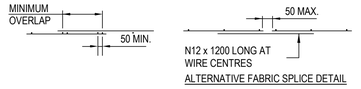
SLAB REINFORCEMENT - LAP LENGTH (mm)			
BAR DIA.	CONCRETE GRADE		
	25 MPa	32 MPa	40 MPa
N12	600	500	450
N16	850	750	650
N20	1100	1000	900

BEAM REINFORCEMENT - LAP LENGTH (mm)						
BAR DIA.	< 300mm CONCRETE CAST BELOW THE BAR			> 300mm CONCRETE CAST BELOW THE BAR		
	CONCRETE GRADE			CONCRETE GRADE		
	25 MPa	32 MPa	40 MPa	25 MPa	32 MPa	40 MPa
N12	600	500	450	750	650	600
N16	850	750	650	1100	950	850
N20	1100	1000	900	1450	1300	1150
N24	1400	1250	1100	1800	1600	1400
N28	1700	1500	1350	2200	1950	1700
N32	2000	1800	1600	2600	2300	2050
N36	2400	2100	1850	3050	2700	2400

BAR DIA.	COLUMN AND WALL REINFORCEMENT LAP LENGTH (mm)
N12	500
N16	650
N20	800
N24	950
N28	1150
N32	1300
N36	1450



R10. LAPS IN MESH (FABRIC) SHALL COMPLY WITH AS3600. THE TWO OUTERMOST TRANSVERSE WIRES OF ONE SHEET SHALL OVERLAP THE TWO OUTERMOST TRANSVERSE WIRES OF THE SHEET BEING LAPPED BY 25MM. A MAXIMUM OF 3 SHEETS OF MESH SHALL BE LAPPED AT ANY POINT.



ALTERNATIVE FABRIC SPLICE DETAIL

R11. SLAB REINFORCEMENT SHALL EXTEND 70mm ONTO SUPPORTING WALLS, WITH 50% OF BOTTOM BARS COGGED TO ACHIEVE ANCHORAGE AT SIMPLY SUPPORTED ENDS. MESH IN SLABS SHALL EXTEND 70mm ONTO SUPPORTING WALLS WITH A CROSS WIRE.

R12. ALL BEAM TIES ARE TO HAVE BAR ANCHORAGES LOCATED ON THE TOP FACE OF THE BEAM UNO.

R13. REINFORCEMENT BAR JOGGLES SHALL BE 1 BAR DIAMETER OVER A LENGTH OF 12 BAR DIAMETERS.

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Issue

No.	Date	Description	Chkd
1	13.02.2023	SCHEMATIC DESIGN	ZP
2	15.06.2023	50% DESIGN DEVELOPMENT	TB
3	15.09.2023	80% DESIGN DEVELOPMENT	TB
4	22.09.2023	100% DESIGN DEVELOPMENT DRAFT ISSUE	TB

THESE DRAWINGS REPRESENT 100% DETAILED DESIGN OPTION ONLY

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Project
CONCORD REPATRIATION GENERAL HOSPITAL
at
109 HOSPITAL ROAD, NSW 2139
for
NSW GOVERNMENT HEALTH & INFRUSTRUCTURE

Drawing Title
NOTES - SHEET 1

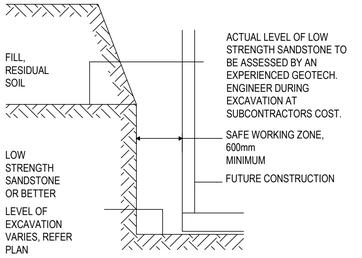
Date 25/09/2023 6:21:30 AM
Scale @ A1

Drawing Reference
22071-S-00.01

Revision
4

TEMPORARY UNSUPPORTED EXCAVATIONS

TEMPORARY UNSUPPORTED EXCAVATION ARE CONTRACTOR DESIGN AND BUILD TO ACHIEVE THE EXCAVATION LEVELS.
RECOMMENDATIONS FOR UNSUPPORTED EXCAVATIONS ARE PROVIDED IN THE GEOTECHNICAL REPORTS ????????? PREPARED BY: ???????????? FOR PRELIMINARY DESIGN PURPOSES ONLY. SPECIFIC REQUIREMENTS SHOULD BE ADVISED BY AN EXPERIENCED GEOTECHNICAL ENGINEER FOR EVERY EXCAVATION AND ASSESSED AS THE WORKS PROCEED.



UNSUPPORTED TEMPORARY EXCAVATION

TUE1. AN EXPERIENCED GEOTECHNICAL ENGINEER SHOULD CARRY OUT CONTINUOUS INSPECTIONS AS THE EXCAVATION PROCEEDS.

TUE2. ALL RECOMMENDATION ON BATTERS OR ADDITIONAL STABILISATION OF VERTICAL CUTS BY THE GEOTECHNICAL ENGINEER ARE TO BE CARRIED OUT IMMEDIATELY. THE GEOTECHNICAL ENGINEER SHOULD REVIEW AND CERTIFY THAT STABILISATION WORKS HAVE BEEN CONSTRUCTED CORRECTLY.

TUE3. TEMPORARY EXCAVATION MAY BE OPEN FOR AN EXTENDED PERIOD OF TIME AND MUST PROVIDE A SAFE WORKING ENVIRONMENT FOR ALL PERSONNEL REQUIRED TO WORK INSIDE THE EXCAVATION. EXCAVATION SHOULD BE DRY.

TUE4. THE EXCAVATION SHOULD BE CONSTANTLY MONITORED FOR ANY SIGN OF DISTRESS OR LOCALISED COLLAPSE. ANY SUCH SIGNS MUST BE REPORTED IMMEDIATELY AND WORKERS INSTRUCTED TO LEAVE THE EXCAVATION.

TUE5. A SERIES OF LADDERS OR STAIRS SHOULD BE PROVIDED TO ENABLE ACCESS AND EXIT. THESE SHOULD BE PROVIDED AT SUITABLY CLOSE CENTRES.

TUE6. A SAFETY AND RISK ASSESSMENT SHOULD BE UNDERTAKEN BY THE CONTRACTOR AND MEASURES PROPOSED TO ELIMINATE OR CONTROL THE HAZARDS.

STRUCTURAL INSPECTIONS DURING CONSTRUCTION

SIN1. UNLESS AGREED OR SPECIFIED OTHERWISE, THE BUILDER IS REQUIRED TO HOLD CONSTRUCTION AND NOTIFY THE STRUCTURAL ENGINEER FOR INSPECTION AT THE FOLLOWING POINTS:

COMPLETED EXCAVATION, FORMWORK, REINFORCEMENT, MEMBRANES AND EMBEDMENTS PRIOR TO PLACING CONCRETE.

COMPLETED ERECTED STRUCTURAL, TIMBER FRAMING PRIOR TO COVERING (UNLESS COVERED BY AS1684 NATIONAL TIMBER FRAMING CODE).

COMPLETED ERECTED STRUCTURAL STEELWORK PRIOR TO COVERING.

SIN2. 48 HOURS NOTICE IS REQUIRED FOR INSPECTION. ALL WORK TO BE INSPECTED MUST BE COMPLETED PRIOR TO THE TIME OF INSPECTION.

SIN3. SITE INSPECTIONS DO NOT RELIEVE THE BUILDER OF RESPONSIBILITY FOR THE COMPLETENESS AND CORRECTNESS OF HIS WORK.

SIN4. INSPECTIONS WILL BE PERIODIC AND REPRESENTATIVE AND WILL NOT NECESSARILY BE MADE OF ALL WORKS. ELECTION TO INSPECT OR OTHERWISE WILL BE AT THE ENGINEER'S DISCRETION. THE BUILDER IS TO ALLOW TIME AND PROVIDE SITE ACCESS FOR THE INSPECTION TO TAKE PLACE AND IS TO HAVE A RESPONSIBLE SITE FOREMAN AVAILABLE TO RECEIVE ANY COMMENT OR DIRECTION FROM THE ENGINEER.

SIN5. WHERE STRUCTURAL ELEMENTS ARE DESIGNED AND CERTIFIED BY OTHER PARTIES, THE BUILDER SHALL OBTAIN WRITTEN CERTIFICATION, PRIOR TO PROCEEDING WITH ANY CONSTRUCTION WHICH MAY PREVENT INSPECTION OR REMEDIAL WORKS BEING UNDERTAKEN TO THESE ITEMS.

SUBGRADE PREPARATION - CLAY

S1. STRIP ALL VEGETATION, TOPSOIL OR OTHER DELETERIOUS MATERIAL TO SPOIL OR STOCKPILE IF SUITABLE FOR REUSE AS LANDSCAPE. THIS SITE SHOULD THEN BE INSPECTED BY A GEOTECHNICAL ENGINEER OR EXPERIENCED TECHNICIAN AT THE CONTRACTORS EXPENSE TO ENSURE THAT THE STRIPPING IS SATISFACTORY.

S2. COMPACT THE STRIPPED SURFACE OVER THE PROPOSED FILL AREAS TO AT LEAST 98% STANDARD MAXIMUM DRY DENSITY (SMDD) AT A MOISTURE CONTENT WITHIN 2% OF OPTIMUM MOISTURE CONTENT (OMC)

S3. THE EXPOSED SURFACE OF THE SITE SHOULD THEN BE PROOF ROLLED AND INSPECTED TO DETECT ANY SOFT AREAS. IF THE PROOF ROLLING IS SATISFACTORY, THEN IN-SITU DENSITY TESTS SHOULD BE CARRIED OUT.

S4. FILLING SHOULD COMPRISE EXCAVATED CLAY SOILS FROM THE SITE OR IMPORTED FILL AND SHOULD BE PLACED IN LAYERS NOT EXCEEDING 200mm COMPACTED THICKNESS TO AT LEAST 98% SMDD WITH A MOISTURE CONTENT WITHIN 2% OF OMC.

S5. DENSITY TESTING AT THIS SITE (AREA GREATER THAN 1500m) SHOULD BE CARRIED OUT IN ACCORDANCE WITH AT LEAST THE MINIMUM FREQUENCY RECOMMENDED IN AS3798 "GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS", TABLE 8.1 (P.28), IE;

A) ONE TEST PER LAYER OR 200MM THICKNESS PER MATERIAL TYPE PER 2500m²;
OR

B) ONE TEST PER 500m³ DISTRIBUTE REASONABLY EVENLY THROUGHOUT DEPTH AND AREA;
OR

C) THREE TESTS PER VISIT, WHICHEVER REQUIRES THE MOST TESTS.

S6. THE LEVEL OF ENGAGEMENT FOR A GEOTECHNICAL TESTING AUTHORITY SHOULD BE LEVEL 1 AS THE FILLING OF THE SITE WILL BE CRITICAL TO THE PERFORMANCE OF THE RAFT SLAB FOOTING SYSTEM. THE TESTING OF THE SUBGRADE SHALL BE CARRIED OUT BY AN APPROVED NATA REGISTERED LABORATORY.

CONSTRUCTION LOADING ON SLABS

CL1. U.N.O. ON PLANS, SLABS ON GRADE AND SUSPENDED SLABS HAVE BEEN DESIGNED TO SUIT THE END USE AS SHOWN ON THE LOADING NOTES AND HAVE NOT BEEN DESIGNED TO CARRY EXCESS LOADS (EITHER DISTRIBUTED OR POINT LOADS) FROM BUILDERS EQUIPMENT, MATERIALS OR TEMPORARY WORKS

CL2. IF THE BUILDER WISHES TO STORE MATERIALS OR RUN EQUIPMENT / VEHICLES ON SLABS WHICH ARE IN EXCESS OF THE END USERS REQUIREMENTS THE BUILDER MAY, AT HIS OWN EXPENSE, EITHER: HAVE THE SLAB DESIGN REVISED TO SUIT HIS REQUIREMENTS.
BRIDGE OVER THE SLAB
DELAY INSTALLATION OF THE SLAB UNTIL LATER IN THE CONSTRUCTION PROGRAMME WITH APPROPRIATE JOINTING BACK PROP THE SLAB

DESIGN AND DOCUMENTATION COSTS AND DELAY COSTS ASSOCIATED WITH SUCH WORK WILL BE BORNE BY THE BUILDER.

SUBGRADE PREPARATION

SP1. REMOVE ALL TOP SOIL, VEGETABLE MATTER AND RUBBLE. IDENTIFY AND REMOVE ANY SOFT AREAS AND PLACE AND COMPACT APPROVED NON-ORGANIC FILL IN ACCORDANCE WITH AS2870.

TEMPORARY WORKS

TW1. ACOR'S DOCUMENTATION DEPICTS THE "PERMANENT" STRUCTURE. DESIGN AND INSTALLATION OF ALL TEMPORARY WORKS AND PROCEDURES WILL BE THE SOLE RESPONSIBILITY OF THE BUILDER.

TW2. THE BUILDER MUST ENGAGE NPER QUALIFIED ENGINEER FOR THE DESIGN OF ALL TEMPORARY WORKS NECESSARY TO SAFELY ERECT THIS STRUCTURE, AS A MINIMUM THE FOLLOWING TEMPORARY WORKS REQUIRE ATTENTION: FORMWORK / TEMPORARY PROPPING / NEEDLE BEAMS / SCAFFOLDING /HOARDING.

TW3. BUILDER MUST CONTACT ACOR IF THEY CONSIDER ANY PART OF THE STRUCTURE IS UNSAFE TO ERECT.

TW4. THE BUILDER WILL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE CAUSED TO ADJOINING BUILDINGS AND ROADWAYS DURING THE INSTALLATION OF THE TEMPORARY WORKS AND THE PERMANENT WORKS.

TW5. ANY TEMPORARY WORK DETAILS AND PROCEDURES GIVEN IN THESE DRAWINGS ARE FOR THE GUIDANCE OF THE BUILDER ONLY.

REINFORCED CONCRETE BLOCKWORK

RB1. ALL WORKMANSHIP SHALL COMPLY WITH AS 3700, AND THE SPECIFICATIONS.

RB2. ALL BLOCKS SHALL CONFORM TO AS 2733.

RB3. THE DESIGN STRENGTH OF CONCRETE MASONRY SHALL BE AS FOLLOWS :-

ELEMENT	BLOCK STRENGTH GRADE	MORTAR MIX CEMENT:LIME:SAND
WALLS	15	M3 MORTAR (NORMAL) 1 : 1 : 6 M4 MORTAR (EXPOSURE GRADE) 1 : 0.5 : 4.5

RB4. LAY BOTTOM COURSE OF BLOCKS ON FULL MORTAR BED. ALL PERPENDS SHALL BE FULLY FILLED WITH MORTAR, EXCEPT WHERE REQUIRED FOR WEEPHOLES.

RB5. CLEAN OUT BLOCKS SHALL BE PROVIDED AT THE BASE OF ALL REINFORCED CORES. REINFORCED CORES SHALL BE CLEANED OF MORTAR PROTRUSIONS BEFORE GROUTING.

RB6. ALL REINFORCED CORES SHALL BE FILLED WITH GROUT. THE GROUT FILLING SHALL BE THOROUGHLY COMPACTED BY MECHANICAL VIBRATOR OR RODDING. UNREINFORCED CORES NEED NOT BE FILLED UNLESS OTHERWISE NOTED.

RB7. GROUT COVER TO REINFORCEMENT IN BLOCK RETAINING WALLS SHALL BE MAINTAINED BY THE USE OF PLASTIC "BLOCKAID" REINFORCEMENT LOCATION BRACKETS (OR APPROVED EQUIVALENT) AT THE INTERSECTION OF ALL HORIZONTAL AND VERTICAL REINFORCEMENT.

RB8. GROUT SHALL BE IN ACCORDANCE WITH AS 3600 AND COMPLY WITH THE FOLLOWING :-

CHARACTERISTIC STRENGTH f'c = 20 MPa AT 28 DAYS.
MAXIMUM AGGREGATE SIZE = 10 mm.
SLUMP = 230 mm.

RB9. MAXIMUM CONTINUOUS POUR HEIGHT SHALL BE 3600 mm, STOP POUR 50 mm BELOW TOP OF BLOCK TO PROVIDE KEY FOR THE FOLLOWING POUR.

RB10. BUILDER IS TO PROVIDE TEMPORARY PROPPING TO WALLS WHERE REQUIRED FOR STABILITY DURING CONSTRUCTION.

VERTICAL JOINTS

RB11. PROVIDE VERTICAL CONTROL JOINTS IN ALL WALLS AT A MAXIMUM OF 8000 mm CENTRES OR AT SLAB JOINTS UNLESS INDICATED OTHERWISE ON THE STRUCTURAL DRAWINGS

HORIZONTAL JOINTS

RB12. PROVIDE HORIZONTAL JOINT REINFORCEMENT EVERY THIRD COURSE FOR SOLID OR CORE FILLED BLOCKS

RB13. REFER TO TYPICAL "REINFORCED BLOCK WALL JUNCTION DETAILS" FOR REINFORCEMENT REQUIREMENTS AT CORNERS AND INTERSECTIONS.

RB14. REFER TO THE ARCHITECTS SPECIFICATIONS FOR ALL WATERPROOFING DETAILS OF WALLS AS REQUIRED.

RB15. REFER TO "RETAINING WALL NOTE" FOR ADDITIONAL INFORMATION ON BACKFILLING AND DRAINAGE SYSTEMS BEHIND RETAINING WALLS.

RB16. REFER TO TYPICAL DETAILS FOR BOND BEAM LINTELS.

RB17. MASONRY WALLS MUST NOT BE CONSTRUCTED ON SUSPENDED CONCRETE UNTIL ALL TEMPORARY SUPPORTS ARE REMOVED AND ALL MASONRY TO BE LAID HAS BEEN STACKED ADJACENT TO PROPOSED POSITION.

TILT-UP PANELS

TP1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS 3600.

TP2. REINFORCEMENT IN TILT-UP PANELS TO BE AS PER TILT-UP SUB-CONTRACTORS DETAILS.

TP3. TILT-UP PANELS TO BE MAINTAINED IN A STABLE CONDITION BY THE CONTRACTOR UNTIL ALL PERMANENT BRACING IS IN PLACE.

TP4. CONNECTION DETAILS FOR TILT-UP PANELS THAT ARE NOT DETAILED ON THE ENGINEERS DRAWINGS TO BE AS PER TILT-UP SUB-CONTRACTORS DETAILS.

TP5. TILT-UP PANELS TO BE DESIGNED TO WITHSTAND ALL FORCES THAT MAY BE APPLIED TO THEM FROM, BUT NOT LIMITED TO THE MAIN STRUCTURAL STEEL ELEMENTS, CONCRETE SLABS AND FORCES DUE TO THE RETENTION OF SOIL.

TP6. ANY FORCES APPLIED TO THE STRUCTURAL STEELWORK AND/OR CONCRETE ELEMENTS FROM TILT-UP PANELS TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND APPROVAL TO APPLY SUCH FORCE OBTAINED PRIOR TO POURING TILT-UP PANELS.

TP7. REFER TO ARCHITECTS DRAWINGS FOR ALL PANEL DIMENSIONS, SHAPES, GROOVES, BLOCKOUTS AND FINISHES ETC.

TP8. JOINTS BETWEEN PANELS TO BE SEALED USING APPROVED FILLER, BACKING ROD AND SEALANT, BY THE TILT-UP PANEL SUB-CONTRACTOR.

TP9. ALL LIFTING AND PROPPING ANCHORS THAT ARE EXPOSED AT THE FINAL STAGE ARE TO BE APPROVED BY THE ARCHITECT.

TP10. PANEL CONTRACTOR TO ALLOW FOR ANY ADDITIONAL CONCRETE (PAD FOOTINGS OR SLAB THICKENINGS) THAT MAY BE REQUIRED TO FACILITATE TEMPORARY PANEL PROPPING AND LIFTING/PLACING REQUIREMENTS.

PRECAST PANELS

PP1. ALL PANELS ARE DETAILED WITH INSIDE OR BRACING FACE UP U.N.O.

PP2. ANY VARIATIONS TO DIMENSIONS, SPECIFIED PRODUCTS, RIGGING ETC, SHALL BE APPROVED BY THE ENGINEER.

PP3. CONCRETE SHALL BE AS NOTED IN CONCRETE NOTES C2.
MINIMUM CONCRETE STRENGTHS REQUIRED PRIOR TO LIFTING ARE :-
a. MODULUS OF RUPTURE 3.45MPa
b. COMPRESSIVE STRENGTH 20MPa

PP4. CRANAGE:
THE SIZE AND TYPE OF CRANE SHALL BE DETERMINED BY OTHERS ALLOWING FOR ALL CONDITIONS, IN PARTICULAR:-
a. WEIGHT OF PANELS AND REACH REQUIRED FOR ERECTION WHILST MAINTAINING LOAD LINE OVER THE CENTRE OF THE LIFT.
b. AVOIDANCE OF SLIDING OR JERKING.
c. SITE CONDITION AND OBSTRUCTIONS

PP5. LIFTING DESIGN ASSUMPTION:
a. NO BOND BETWEEN PANEL AND CASTING SURFACE
b. NO SHRINKAGE CRACKS
c. NO IMPACT LOADS DURING ERECTION

PP6. NO LIFTING OR BRACING EQUIPMENT SHALL BE USED IF DAMAGED.

PP7. NO WELDING OR APPLICATIONS OF HEAT SHALL BE PERMITTED TO ANY SPECIFIED INSERTS OR EQUIPMENT.

PP8. ALL FLOOR BRACE INSERTS SHALL BE NOT LESS THAN 600mm FROM JOINTS.

PP9. REFER TO ARCHITECTS DRAWINGS FOR SILL BEVEL, REBATE AND SPITTER DETAILS.

PP10. PRECAST PANELS SHALL COMPLY WITH AS 3850.

PP11. SURFACE QUALITY:
a. DIMENSIONAL TOLERANCES OF PANELS SHALL COMPLY WITH TABLE 3.7.1 OF AS 3850. HENCE CASTING BEDS (FLOOR SLABS, PAVEMENTS AND TEMPORARY CASTING BEDS) MUST BE POURED TO TOLERANCES WHICH WILL REFLECT THE REQUIRED SURFACE FINISHES OF THE PANELS.
b. ALL PRECAST PANELS, FLOOR SLABS AND CASTING BEDS SHALL HAVE A STEEL TROWELLED FINISH WHICH DOES NOT EXHIBIT TROWEL MARKS, NOR, IN THE CASE OF FLOORS AND CASTING BEDS, REFLECT TROWEL MARKS IN THE PANELS POURED ON THEM.
c. IN ADDITION WITH COMPLYING WITH THE DEFLECTION LIMITS OF AS 3600 SECTION 24.9, SURFACE IMPERFECTIONS ON FORMED AND TROWELLED SURFACES SHALL NOT EXCEED THOSE SPECIFIED FOR THE RELEVANT CLASSIFICATION OF FORMWORK REQUIRED BY ARCHITECT IN AS 3610.

PP12. ALL PRECAST PANELS SHALL BE GROUTED TO PROVIDE A CONTINUOUS BEARING UNDER THE FULL WIDTH OF THE PANELS. WHERE PANELS SUPPORT SUSPENDED SLABS GROUTING SHALL BE ADEQUATELY CURED PRIOR TO REMOVAL OF FORMWORK. LOCATION OF SHIMS ARE ONLY ALLOWED AT POSITIONS SHOWN ON THE DRAWINGS.

PP13. PANEL LIFTING SHALL BE CARRIED OUT USING THE FOLLOWING METHOD STATEMENT:
a. WITH THE CRANE LOAD DIRECTLY OVER THE CENTRE OF THE LIFT, THE CRANE SHALL BE SET TO THE INITIAL LIFT LOAD.
b. STEEL WEDGES SHALL THEN BE PLACED AGAINST THE PANEL AND FLOOR AT AND/OR NEAR THE TOP OF THE PANEL AND STRUCK UNTIL SUCTION BETWEEN THE PANEL AND THE FLOOR SLAB HAS BEEN RELIEVED.
c. LIFTING MANY THEN PROCEED.

PP14. ALL REINFORCEMENT SHOWN ON THE STRUCTURAL DRAWINGS IS FOR IN-SERVICE LOADING ONLY.
THE PRECAST PANEL CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF ANY ADDITIONAL REINFORCEMENT WHICH MAY BE REQUIRED TO ENSURE LIFTING STRESSES ARE WITHIN THE RELEVANT CODES AND ALL BRACING AND SUPPORTING STRUCTURES (DEADMAN OR FLOOR SLAB) ARE STRUCTURALLY ADEQUATE TO SUPPORT ALL RELEVANT WIND LOADINGS. THE SUB CONTRACTOR SHALL PROVIDE AN ENGINEERS CERTIFICATE (WITH THEIR REGISTERED NUMBER) FOR ALL THESE ITEMS TO THE BUILDER AND FORWARD A COPY TO ACOR CONSULTANTS PTY LTD CERTIFYING THAT THEY COMPLY WITH AS 3850, AS 3608 AND AS/NZS 1170.2.
ACOR CONSULTANTS PTY LTD ARE UNABLE TO REVIEW OR SIGN OFF PANEL SHOP DRAWINGS UNTIL WE RECEIVE THIS DESIGN CERTIFICATION.

POST TENSIONED CONCRETE - DESIGN AND CONSTRUCT

SCOPE OF WORKS

PT1. THE SCOPE OF WORKS SHALL CONSIST OF THE DESIGN, INSTALLATION AND CERTIFICATION OF THE POST-TENSIONED PRESTRESSING AND NON-TENSIONED REINFORCEMENT, FOR ALL SUSPENDED FLOOR SLABS SHOWN

PT2. THE POST TENSIONED PRESTRESSING AND NON-TENSIONED REINFORCEMENT SHALL EXTEND FOR THE FULL PLAN AREA, INCLUDING ALL STRUCTURAL HOBS, FOLDS, SET-DOWNS FORMING PART OF THE FLOOR SLAB.

PT3. IT IS THE SUB-CONTRACTORS RESPONSIBILITY TO ENSURE THAT THE POST-TENSIONED PRESTRESSING AND NON-TENSIONED REINFORCEMENT IS DESIGNED, INSTALLED AND CERTIFIED IN ACCORDANCE WITH THESE NOTES AND THE REQUIREMENTS OF AS3600. THE NON-TENSIONED REINFORCEMENT INCLUDES ALL ANCHORAGE ZONES ANTI BURSTING REINFORCEMENT, THE REINFORCEMENT OF ANY SLAB AREAS NOT INCLUDED IN THE PRESTRESSED AREAS.

DESIGN - DESIGN LOADS

PT4. ALL LOADS ARE TO BE IN ACCORDANCE WITH THE LOADS NOMINATED ON THE STRUCTURAL DRAWINGS, DESIGN BRIEF AND AS1170.

PT5. WHERE COLUMN LOADS ARE NOT NOMINATED ON THE STRUCTURAL DRAWINGS IT IS THE SUB-CONTRACTORS RESPONSIBILITY TO CALCULATE LOADS. WHERE LOADS ARE CALCULATED BY THE SUB-CONTRACTOR LOADS ARE TO BE ISSUED TO ACOR FOR REVIEW PRIOR TO COMMENCEMENT OF DESIGN.

SERVICEABILITY

AREA	DEFLECTION CRITERIA	
	INCREMENTAL DEFLECTION	LONG TERM DEFLECTION
OFFICE	LESS THAN SPAN/500 UNDER ALL MASONRY WALL	LESS THAN SPAN/300 OR 25mm
PODIUM	LESS THAN SPAN/1000 UNDER COLUMN TRANSFERS LESS THAN SPAN/1000 UNDER COLUMN TRANSFERS	LESS THAN SPAN/300 OR 25mm

PT6. COLUMN STIFFNESS:
ANY CONTRIBUTION OF THE COLUMNS IN THE FLOOR SLAB / BEAM DESIGN SHALL BE LIMITED TO A MAXIMUM OF 20% OF THE GROSS COLUMN STIFFNESS.

PT7. MINIMUM PRESTRESS:
ALL SLABS SHALL HAVE AN AVERAGE RESIDUAL PRESTRESS IN EACH DIRECTION AFTER ALL LOSSES OF:
P/A > 1.5MPA FOR ALL INTERNAL AREAS FULLY ENCLOSED
P/A > 1.8MPA FOR ALL EXTERNAL AREAS

PT8. PROVIDE MINIMUM SL82 MESH (TOP) TO ALL EXTERNAL AREAS.

PT9. ALL TENDONS AND REINFORCEMENT SHALL HAVE CONCRETE COVER IN ACCORDANCE WITH AS3600 FOR THE FOLLOWING EXPOSURE CLASSIFICATIONS:
INTERNAL - A1
EXTERNAL - B1

PT10. ALL TENDONS AND REINFORCEMENT SHALL HAVE CONCRETE COVER IN ACCORDANCE WITH AS3600 TO PROVIDE A 180 MINUTE FIRE RESISTANCE PERIOD.

PT11. UNDER ALL PRECAST & MASONRY WALLS ENSURE CONCRETE ZONE IMMEDIATELY BELOW THE WALLS DOES NOT HAVE POST TENSIONING DUCTS PARALLEL TO THE WALL.

PT12. THE CONCRETE STRENGTH SHALL BE THE SAME AS THAT SHOWN ON THE STRUCTURAL DRAWINGS.

PT13. THE SUB-CONTRACTOR IS TO ALLOW TO COORDINATE DESIGN WITH ALL OTHER CONSULTANTS AND SUB-CONTRACTORS DRAWINGS.

PT14. THE SUB-CONTRACTOR MUST SUBMIT ONE COPY OF THE TENDON AND REINFORCEMENT PLANS FOR APPROVAL 14 DAYS PRIOR TO COMMENCEMENT OF ANY INSTALLATION WORK. PLANS MUST SHOW ALL TENDONS - LOCATION, SIZE AND DRAPE, AND ALL NON-TENSIONED REINFORCEMENT. INSTALLATION WORK MAY NOT COMMENCE UNTIL THE APPROVED LAYOUT PLANS, INCORPORATING ANY REQUIREMENTS, ARE RETURNED TO THE SUB-CONTRACTOR. ALLOW 7 DAYS FOR THE REVIEW AND APPROVAL OF DRAWINGS. THE REVIEW AND APPROVAL OF THE DRAWINGS DOES NOT RELIEVE THE SUBCONTRACTOR OF THEIR RESPONSIBILITY.

PT15. ALL DESIGNS ARE TO BE PREPARED AND CERTIFIED BY A PROFESSIONAL STRUCTURAL ENGINEER WITH NPER REGISTRATION. CERTIFICATION IS TO BE PROVIDED PRIOR TO COMMENCEMENT OF INSTALLATION THAT THE FLOOR STRUCTURE IS STRUCTURALLY ADEQUATE TO RESIST THE DESIGN LOADS IN ACCORDANCE WITH ALL RELEVANT AUSTRALIAN STANDARDS. THE CERTIFYING ENGINEER SHALL MAINTAIN PROFESSIONAL INDEMNITY INSURANCE OF AT LEAST $5.0 MILLION AND PROVIDE A COPY OF THEIR INSURANCE CURRENCY.

CONSTRUCTION

PT16. ALL WORKMANSHIP AND MATERIALS MUST COMPLY WITH AS3600.

PT17. PRESTRESSING STRANDS SHALL BE STRESS RELIVED SUPER GRADE AND COMPLY WITH AS4672

PT18. ALL TENDONS SHALL BE PLACED IN A GALVANIZED DUCT.

PT19. ALL TENDONS AND REINFORCEMENT MUST BE SECURELY POSITIONED AND FIXED PRIOR TO PLACEMENT OF CONCRETE.

PT20. STRESSING RECORDS OF THE PRESSURE GAUGE AND EXTENSIONS SHALL BE ACCURATELY MADE

PT21. ALL TENDONS MUST BE GROUTED IN THEIR DUCTS AFTER APPROVAL OF THE STRESSING RECORDS.

PT22. ALL ANCHORAGE RECESSES AND PANS MUST BE FILLED WITH 30MPA GROUT, FINISHED TO A SMOOTH AND LEVEL SURFACE.

PT23. UPON COMPLETION PROVIDE AN AS BUILT DRAWING OF ALL DUCT LOCATIONS FOR CO-ORDINATION BY OTHER SUB-CONTRACTORS.

PT24. A PROFESSIONAL ENGINEER WITH NPER REGISTRATION SHALL INSPECT ALL WORKS AND CERTIFY THAT THE PRESTRESSING AND REINFORCEMENT AS INSTALLED IN THE SLAB COMPLIES WITH THE APPROVED CONSTRUCTION DRAWINGS, IN PARTICULAR, THAT ALL TENDONS AND REINFORCEMENT WERE ACCURATELY POSITIONED WITH THE CORRECT COVER AND THAT ALL TENDONS HAVE BEEN CORRECTLY STRESSED AND GROUTED. THE CERTIFYING ENGINEER SHALL MAINTAIN PROFESSIONAL INDEMNITY INSURANCE OF AT LEAST $5.0 MILLION AND PROVIDE A COPY OF THEIR INSURANCE CURRENCY.

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Issue

No.	Date	Description	Chkd
1	13.02.2023	SCHEMATIC DESIGN	ZP
2	15.06.2023	50% DESIGN DEVELOPMENT	TB
3	15.09.2023	80% DESIGN DEVELOPMENT	TB
4	22.09.2023	100% DESIGN DEVELOPMENT DRAFT ISSUE	TB

THESE DRAWINGS REPRESENT 100% DETAILED DESIGN OPTION ONLY

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Client
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Project
CONCORD REPATRIATION GENERAL HOSPITAL
at
109 HOSPITAL ROAD, NSW 2139
for
NSW GOVERNMENT HEALTH & INFRUSTRUCTURE

Drawing Title
NOTES - SHEET 2

Date 25/09/2023 6:21:30 AM
Scale @ A1

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Revision 4

FORMWORK

FW1. THE DESIGN, CERTIFICATION, CONSTRUCTION, INSPECTION AND PERFORMANCE OF THE FORMWORK AND FALSE WORK SHALL BE CERTIFIED BY AN NPER STRUCTURAL ENGINEER AND IS THE RESPONSIBILITY OF THE BUILDER, EXCEPT TO THE EXTENT THAT FORMWORK DESIGN IS SHOWN ON THE STRUCTURAL DRAWINGS.

FW2. FORMWORK DESIGN, CONSTRUCTION, TOLERANCES AND STRIPPING TIMES SHALL COMPLY WITH AS3610 AND AS3600 UNLESS OTHERWISE APPROVED BY THE STRUCTURAL ENGINEER.

FW3. CONCRETE FORMED SURFACE FINISHES SHALL COMPLY WITH AS3610 AS SPECIFIED BY THE PROJECT ARCHITECT.

FW4. DIMENSIONAL TOLERANCES SHALL COMPLY WITH AS3610 FOR APPROPRIATE FINISH CLASS.

FW5. FORMWORK SHALL BE DESIGNED TO ACCOMMODATE MOVEMENTS AND LOAD REDISTRIBUTION DUE TO POST-TENSIONING.

FW6. FORMWORK SHALL NOT BE DESIGNED TO RELY ON RESTRAINT OR SUPPORT FROM THE PERMANENT STRUCTURE WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

FW7. WHERE METAL FORMWORK IS SHOWN IE BONDEK, CONDEK, KINGFLOOR ETC IS SHOWN, THE CONTRACTOR SHALL INSTALL AND PROP THE WORKS IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATION UNLESS NOTED OTHERWISE ON THE STRUCTURAL DRAWINGS

FW8. DESIGN INFORMATION CONCERNING THE FOUNDATIONS FOR FORMWORK SHALL BE DETERMINED FROM THE CONDITIONS EXISTING ON SITE AT THE TIME OF CONSTRUCTION. REFER TO THE GEOTECHNICAL REPORT FOR THE SITE.

FW9. DURING CONSTRUCTION PROVIDE PROPPING WHERE LOADS FROM STACKED MATERIALS, FORMWORK AND OTHER SUPPORTED SLABS INDUCE LOADS IN THE SLAB OR BEAM WHICH EXCEED THE DESIGN LOAD FOR STRENGTH OR SERVICEABILITY AT THAT AGE. ONCE THE NOMINATED 28 DAY STRENGTH HAS BEEN ATTAINED, THESE LOADS SHALL NOT EXCEED THE DESIGN SUPERIMPOSED LOADS SET-OUT IN THE STRUCTURAL DESIGN LOADS.

FW10. IN MULTI-STOREY CONSTRUCTION PROPPING MAY NEED TO EXTEND A NUMBER OF FLOORS LEVELS BELOW THE FLOOR BEING CAST. PROP REMOVAL IS TO BE PROGRAMMED TO AVOID DISTRESS TO PREVIOUSLY CAST FLOORS, RE-SHORING OR BACK-PROPPING IS SUBJECT TO THE STRUCTURAL ENGINEER.

FW11. DO NOT PLACE PERMANENT LOADS ON THE CONCRETE STRUCTURE UNTIL AFTER FORMWORK AND PROPPING IS REMOVED.

FW12. REFER TO ARCHITECTS DRAWINGS FOR TEST PANEL DETAILS. REINFORCEMENT FOR TEST PANELS SHALL BE SIMILAR TO THAT IN THE PERMANENT STRUCTURE BEING REPRESENTED

FW13. BEFORE PLACING REINFORCEMENT IN FORMWORK, APPLY A RELEASE AGENT TO THE FACE OF THE FORMWORK COMPATIBLE WITH THE REQUIRED SURFACE FINISH.

FW14. CHAMFER RE-ENTRANT ANGLES AND FILLETS AT CORNERS BY 25MM UNO.

FW15. BEFORE PLACING CONCRETE, REMOVE ALL WATER, DUST AND DEBRIS FROM THE FORMWORK.

FW16. FILL ALL HOLES LEFT BY FORM TIE BOLTS WITH MORTAR MATCHING THE SURFACE COLOUR OF THE FINISHED SURFACE.

FW17. CONCRETE FORMED SURFACES TO HAVE THE FOLLOWING FINISHES IN ACCORDANCE WITH AS 3610.

FW18.

ELEMENT	SURFACE FINISH	CRITICAL FACE
FOOTING BEAMS	CLASS 3	EXPOSED FACE
SLABS AND BEAMS	REFER TO ARCHITECTS SPECIFICATIONS	

STRUCTURAL STEELWORK

S1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH STEEL STRUCTURE - AS 4100 AND WELDING - AS 1554 EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENT.

S2. STEEL COMPONENTS SHALL CONFORM TO THE FOLLOWING TABLE U.N.O.

COMPONENT	AUS. STAND.	GRADE
PLATE	3678	250
HOT ROLLED SECTIONS	3679	300
CHS > 80 mm DIA.	1163	C350
CHS < 80 mm DIA.	1163	C250
RHS & SHS	1163	C350
PURLINS & GIRTS	1397	450
WELDED BEAMS & COLUMNS	3679	300
FLAT BARS & RODS.	3679	250

S3. BOLT DESIGNATION

ALL BOLTS TO BE 8.8/S UNLESS NOTED OTHERWISE

4.6/S COMMERCIAL BOLTS OF GRADE 4.6 TO AS 1111 SNUG TIGHTENED.
8.8/S HIGH STRENGTH STRUCTURAL BOLTS OF GRADE 8.8 TO AS 1252 SNUG TIGHTENED.
8.8/TB HIGH STRENGTH BOLTS OF GRADE 8.8 TO AS 1252 FULLY TENSIONED TO AS 4100 AS A BEARING JOINT.
8.8/TF HIGH STRENGTH STRUCTURAL BOLTS OF GRADE 8.8 TO AS 1252 FULLY TENSIONED TO AS 4100 AS A FRICTION JOINT WITH CONTACT SURFACES LEFT UNCOATED.

S4. ALL BOLTS SHALL BE M20 GRADE 8.8/S U.N.O.
ALL STUDS SHALL BE M20 GRADE 4.6/S U.N.O.
NO STEEL TO STEEL CONNECTION TO HAVE LESS THAN 2 BOLTS.

S5. ALL PLATES TO BE 10 mm THICK U.N.O.

S6. UNLESS NOTED OTHERWISE, ALL FILLET WELDS SHALL BE
6mm CONTINUOUS FOR PLATES LESS THAN OR EQUAL TO 12 PL
8mm CONTINUOUS FOR 16 PL
10mm CONTINUOUS FOR 20 PL AND ABOVE.

ELEMENT	WELD CATEGORY
ALL	SP

ALL BUTT WELDS TO BE COMPLETE PENETRATION BUTT WELDS. ELECTRODES TO BE E48XX U.N.O. WELD CATEGORY AS TABULATED ABOVE.

S7. THE CONTRACTOR SHALL MAKE THE NECESSARY ALLOWANCES FOR COORDINATING ALL ARCHITECTURAL & STRUCTURAL ELEMENTS IN THE PREPARATION OF STRUCTURAL STEELWORK SHOP DRAWINGS & SUBSEQUENT FABRICATION & ERECTION. CONNECTION DETAILS SHOWN ON STRUCTURAL DRAWINGS ARE TYPICAL ONLY. WHERE A DETAIL IS NOT SHOWN THE FABRICATOR / SHOP DETAILER SHALL PREPARE DETAILS IN ACCORDANCE WITH AS4100 & THE AISC PUBLICATIONS `DESIGN OF STRUCTURAL CONNECTIONS' & `STANDARDISED STRUCTURAL CONNECTIONS'. THESE DETAILS SHALL TAKE DUE ACCOUNT OF ARCHITECTURAL & SERVICE REQUIREMENTS & SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. THE ENGINEER WILL SUPPLY LOADS AS REQUIRED. ALL COSTS & TIME IMPLICATIONS ASSOCIATED WITH THESE WORKS ARE TO BE ALLOWED FOR BY THE CONTRACTOR.

S8. STRUCTURAL STEELWORK SHALL HAVE THE FOLLOWING TREATMENT:-

ELEMENT	SURFACE PREPARATION	PROTECTIVE COATING
INTERIOR MEMBERS	BLAST CLEAN TO CLASS 2 (AS 1627)	ZINC PHOSPHATE PRIMER FILM THICKNESS 0.075mm
EXPOSED TO WEATHER INCLUDING ALL STIFFENERS	PICKLE (AS 1627 PART 5)	HOT DIP GALVANISED REFER TO SPECIFICATIONS.

S9. ALL STRUCTURAL STEELWORK WHICH IS EXPOSED, STEELWORK IN CONTACT WITH EXTERNAL CAVITY BRICKWORK & ALL LINTELS SHALL BE HOT DIP GALVANISED OR STAINLESS STEEL - REFER TO DRAWINGS. GALVANISING OF STRUCTURAL SECTIONS SHALL BE IN ACCORDANCE WITH AS 4680 AND THE GALVANISING OF THREADED FASTENERS SHALL BE IN ACCORDANCE WITH AS 1214

S10. AFTER FABRICATION ALL EXPOSED STEELWORK AND STEELWORK BUILT IN EXTERNAL WALLS INCLUDING FITMENTS, NUTS, BOLTS, WASHERS AND HOLDING DOWN BOLTS TO BE HOT DIP GALVANISED.

S11. ANY FURTHER WELDED JOINTS ARE TO BE PAINTED WITH 2 COATS OF APPROVED GALVANISED PAINT.

S12. THE ENDS OF ALL TUBULAR MEMBERS ARE TO BE SEALED WITH NOMINAL THICKNESS PLATES AND CONTINUOUS FILLET WELD UNLESS OTHERWISE SHOWN ON THE DRAWINGS.

S13. THE SUB-CONTRACTOR SHALL PROVIDE ALL CLEATS AND DRILL ALL HOLES NECESSARY FOR ALL ATTACHMENTS WHETHER OR NOT DETAILED ON THE DRAWINGS.

S14. PROVIDE HOOK BOLTS AT EVERY THIRD PURLIN TO CONTROL BRACE SAG.

S15. ALL STEELWORK IS TO BE TEMPORARILY BUT SECURELY BRACED UNTIL ALL FINAL BRACING, CLADDING & STABILISING BRICK OR BLOCKWORK HAVE BEEN COMPLETED.

S16. GRAVITY &/OR GAUGE LINES TO INTERSECT U.N.O.

S17. CONCRETE ENCASED STEELWORK TO BE WRAPPED WITH F41 MESH & TO HAVE 50mm MIN. COVER OF CONCRETE GRADE 25 TO AS3600

S18. ALL BASEPLATES ARE TO BE FULLY GROUTED WITH CONBEXTRA GP CEMENTITIOUS NON-SHRINK GROUT, OR SIMILAR, WITH A MINIMUM COMPRESSIVE STRENGTH OF 50 MPa

S19. SHOP DRAWINGS SHALL BE PREPARED BY THE FABRICATOR FOR ALL STRUCTURAL STEELWORK. SUBMIT COPIES OF ALL WORKSHOP DRAWINGS TO ACOR CONSULTANTS FOR STRUCTURAL APPROVAL AT LEAST 14 DAYS PRIOR TO FABRICATION. DO NOT FABRICATE STEELWORK UNTIL WORKSHOP DRAWINGS ARE APPROVED.

STRUCTURAL STEELWORK CONT'

PURLINS AND GIRTS

S20. ALL PURLINS AND GIRTS TO BE COLD FORMED LIGHT-GAUGE STEEL SECTIONS CONFORMING TO ANZ4600 FOR DESIGN AND TO AS1397 FOR MATERIAL PROPERTIES

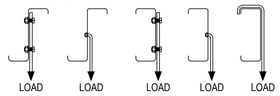
S21. THE OVERALL DIMENSIONS OF PURLINS AND GIRTS SHALL NOT BE LESS THAN THE NOMINAL SIZE GIVEN, BOTH FLANGES SHALL BE LIPPED

S22. SETOUT OF PURLINS & GIRTS TO BE OBTAINED FROM ARCHITECT'S DRAWINGS OR ROOFING CONTRACTOR

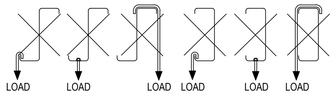
S23. PROVIDE TRIMMER PURLINS BETWEEN MAIN PURLINS TO SUIT ROOF PROFILE(HIPS, VALLEYS, RIDGE LINES ETC.) AND CONNECT WITH PROPRIETARY CLEATS AS RECOMMENDED BY MANUFACTURER

S24. WHERE NECESSARY TO HANG CEILING, SERVICE PIPES, DUCTWORK ETC. FROM PURLINS, THE BUILDER SHALL ONLY USE THE FOLLOWING APPROVED METHODS.

APPROVED METHODS OF SUSPENDING FROM PURLINS



NON-APPROVED METHODS OF SUSPENDING FROM PURLINS



IF IN DOUBT OBTAIN APPROVAL FROM ENGINEER PRIOR TO PROCEEDING WITH INSTALLATION.

FIRE PROTECTION

S29. FIRE PROTECTION REQUIREMENTS TO STEELWORK ARE TO BE AS PER FIRE ENGINEERS DETAILS OR ARCHITECTURAL SPECIFICATIONS.

LIGHT WEIGHT STEEL FRAMING

S30. UNLESS SPECIFICALLY DETAILED ON THE STRUCTURAL DRAWINGS, ALL STEEL STUD WALL FRAMING AND FIXINGS SHALL BE AS MANUFACTURED BY 'RONDO BUILDING SERVICES PTY. LTD.' OR EQUIVALENT, ALL TO BE IN ACCORDANCE WITH THEIR DESIGN MANUAL AND INSTALLATION MANUALS FOR STEEL STUD WALL SYSTEMS.

S31. THE DESIGN SHALL COMPLY WITH AS4600, TO SUIT THE LOADS SPECIFIED IN THE GENERAL NOTES AND THE SPECIFICATION. AN NPER STRUCTURAL ENGINEER SHALL CERTIFY THE DESIGN. PROVIDE ALL TRIMMERS, HEADS, NOGGINGS ETC.

ROOF SAFETY ACCESS SYSTEMS

RS1. A ROOF SAFETY ACCESS SYSTEM WHICH COMPLIES WITH THE RELEVANT OH&S REGULATIONS FOR FALL ARREST AND THE RELEVANT AUSTRALIAN STANDARDS IS TO BE INSTALLED AND CERTIFIED BY AN APPROPRIATELY EXPERIENCED SPECIALIST SUPPLIER.

RS2. THE DESIGN BY THE SPECIALIST IS TO INCLUDE SYSTEM SELECTION, LAYOUT, INSTALLATION, FLASHING, STRENGTHENING WORKS AND CERTIFICATION.

GROUTING OF BASE PLATES

GB1. ALL GROUT SHALL BE CURED BY THE APPLICATION OF 'MBT AUSTRALIA' 'FLOORSEAL' APPLIED TO THE GROUT STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN PROCEDURE.

GB2. THE THICKNESS OF THE GROUT BED SHALL BE 50mm.

GB3. GROUT ALL STEEL BASES BY DRY PACKING USING GROUT WHICH IS NON-SHRINK AND HAS A MINIMUM COMPRESSIVE STRENGTH AT 7 DAYS OF 40 Mpa

DRILLED IN CHEMICAL AND MECHANICAL ANCHORS

DA1. DRILLED ANCHORS SHALL BE USED WHERE SHOWN ON THE DRAWINGS, OR WHERE PERMITTED IN WRITING BY THE ENGINEER. SUBMIT DETAILS OF PROPOSED ANCHORS, BEFORE USE, IN WRITING, TO THE ENGINEER FOR REVIEW. INSTALL ANCHORS IN ACCORDANCE WITH MANUFACTURER'S WRITTEN DIRECTIONS. TEST ANCHORS AS SPECIFIED BELOW.

DA2. SPACING AND EDGE DISTANCES SHALL BE AS SHOWN, OR IN ACCORDANCE WITH THE MANUFACTURERS DIRECTIONS, AND SHALL BE APPROPRIATE FOR THE LOAD ON THE ANCHOR. UNLESS SHOWN OTHERWISE OR ALLOWED BY THE MANUFACTURER, THE FOLLOWING MINIMUMS SHALL BE USED FOR M20 CHEMICAL ANCHORS IN CONCRETE: SPACING=150mm, EDGE DISTANCE=150mm.

DA3. FOR ATTACHMENT TO HOLLOW MASONRY OR CONCRETE PANELS, USE HILTI HIT HY20 OR EQUIVALENT.

DA4. HOLES IN STEELWORK SHALL BE:
2mm OVERSIZE WHEN THE STEEL IS TO BE USED AS A DRILLING TEMPLATE, OR
6mm MAXIMUM OVERSIZE WHERE THE BOLTS ARE INSTALLED BEFOREHAND.

DA5. DRILLED-IN ANCHOR TESTING

ANCHOR TESTING LOAD TO BE 150% OF SAFE WORKING LOAD OR 100% OF ULTIMATE LOAD, TO MANUFACTURER'S PRODUCT SPECIFICATION. TESTS TO BE CARRIED OUT BY N.A.T.A. REGISTERED LABORATORY AT THE CONTRACTOR'S EXPENSE.

CHEMICAL ANCHORS

NUMBER OF CHEMICAL ANCHORS TO BE TESTED IS AS FOLLOWS:
INSTALLATION FROM ABOVE AND SIDE = 20% OF TOTAL NUMBER IS TO BE TESTED.
INSTALLATION FROM BELOW = 100% OF TOTAL NUMBER IS TO BE TESTED

MECHANICAL ANCHORS

TEST 10% OF MECHANICAL ANCHORS

FAILURE

IF ONE ANCHOR IN A GROUP FAILS UNDER TESTING THEN ALL ANCHORS SHALL BE TESTED, AS SPECIFIED ABOVE, AT THE CONTRACTOR'S EXPENSE. ALL ANCHORS THAT FAIL ARE TO BE REPLACED AND RETESTED. FORWARD CERTIFICATES OF ALL TEST RESULTS TO ACOR CONSULTANTS.

STRUCTURAL DESIGN LOADS

L1. THE STRUCTURAL COMPONENTS DETAILED ON THESE DRAWINGS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE RELEVANT STANDARDS AUSTRALIA CODE AND THE BUILDING CODE OF AUSTRALIA FOR THE FOLLOWING LOADINGS. REFER TO ARCHITECTURAL DRAWINGS FOR PROPOSED FLOOR USAGE.

L2. SUPERIMPOSED LOADS IN ACCORDANCE WITH AS1170.1

FLOOR USAGE	SUPERIMPOSED DEAD LOAD (kPa)	LIVE LOAD (kPa)
GENERAL FLOOR AREA	1.8	2.0
OFFICE AREA	1.8	3.0
STAIRS LANDINGS	4.0	0.0
ROOF	1.0	0.25
PLANT AREA	2.4	7.5

L3. WIND LOADS IN ACCORDANCE WITH AS1170.2

REGION		A2
STRUCTURAL IMPORTANCE LEVEL		2
REGIONAL WIND SPEED	Vr (ULTIMATE)	46 m/s
	Vr (SERVICEABILITY)	37 m/s
TERRAIN CATEGORY		VARIES
TERRAIN / HEIGHT MULTIPLIER		1
SHIELDING MULTIPLIER		1
TOPOGRAPHIC MULTIPLIER		1
HILL-SHAPE MULTIPLIER		1

L4. EARTHQUAKE DESIGN PARAMETERS TO AS1170.4

STRUCTURAL IMPORTANCE LEVEL		2
PROBABILITY FACTOR	kp	1.0
HAZARD FACTOR	Z	0.08
SITE SUB SOIL CLASS		Be (TBC)
EARTHQUAKE DESIGN CATEGORY		II

RETAINING WALL - REINFORCED CONCRETE BLOCKWORK

RW1. ALL WORKMANSHIP SHALL COMPLY WITH AS 4679 AND AS 3700.

RW2. RETAINING WALL FOOTINGS HAVE BEEN DESIGNED FOR AN ALLOWABLE BEARING PRESSURE AS NOTED ON DRAWINGS. THIS FOUNDATION MATERIAL SHALL BE UNIFORM AND BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF ANY FOOTING REINFORCEMENT.

RW3. REFER TO "REINFORCED CONCRETE BLOCKWORK" NOTES FOR ADDITIONAL SPECIFICATIONS.

RW4. TEMPORARY BATTERS TO BE AS PER GEOTECHNICAL ENGINEERS REPORTS.

RW5. PROVIDE CLEAN-OUT BLOCKS AT THE BASE OF EACH POUR LIFT. REINFORCED CORES SHALL BE CLEANED OF MORTAR PROTRUSIONS BEFORE GROUTING

RW6. HORIZONTAL REINFORCEMENT IN WALLS IS TO BE SPLICED 600 AS REQUIRED.

RW7. REFER TO TYPICAL DETAILS FOR FOOTING STEPS, INTERSECTION / CORNER DETAILS, AND VERTICAL CONTROL JOINT DETAILS.

RW8. COVER TO REINFORCEMENT IN BLOCK RETAINING WALLS SHALL BE MAINTAINED BY THE USE OF PLASTIC "BLOCKAID" REINFORCEMENT LOCATION BRACKETS (OR APPROVED EQUIVALENT) AT THE INTERSECTION OF ALL HORIZONTAL AND VERTICAL REINFORCEMENT.

RW9. ALL CORES ARE TO BE FULLY GROUTED. GROUT SHALL BE IN ACCORDANCE WITH AS 3600 AND COMPLY WITH THE FOLLOWING :-
CHARACTERISTIC STRENGTH f'c = 20 MPa AT 28 DAYS.
MAXIMUM AGGREGATE SIZE = 10 mm.
SLUMP = 230 mm.

RW10. PROVIDE WATERPROOFING MEMBRANES AS REQUIRED BY ARCHITECTURAL SPECIFICATIONS. DESIGN, EXTENT AND CERTIFICATION OF MEMBRANE IS TO BE PROVIDED BY WATERPROOFING SPECIALIST.

RW11. RETAINING WALLS ARE DESIGNED BASED ON THE ASSUMPTION THAT A FUNCTIONING DRAINAGE SYSTEM IS EFFECTIVE IN REMOVING HYDRAULIC PRESSURE . PROVIDE CONTINUOUS AG DRAINS BEHIND THE ENTIRE EXTENT OF THE RETAINING WALL. THE DRAINAGE SYSTEM IS TO BE DESIGNED FOR LONG TERM PERFORMANCE EQUAL TO THAT OF THE DESIGN LIFE OF THE WALL. THE DESIGN AND DOCUMENTATION OF THIS SYSTEM IS BY OTHERS AND IS TO INCLUDE DETAILS OF EFFLUX POINTS FOR THE DRAINAGE AND ACCESS / MAINTENANCE POINTS.

RW12. BACKFILL BEHIND THE WALL IS TO BE CLASSIFIED AS FREE DRAINING GRANULAR MATERIAL. FREE DRAINING GRANULAR MATERIAL SHALL BE A NON-COHESIVE WELL GRADED GRANULAR MATERIAL COMPRISING SOUND STONE PARTICLES WHICH DO NOT BREAK DOWN UNDER COMPACTION, WETTING OR EXPOSURE TO AIR. THE MATERIAL PROPERTIES SHALL COMPLY WITH THOSE SPECIFIED IN TABLE BELOW.

FREE DRAINING GRANULAR MATERIAL PROPERTIES		
PROPERTY	LIMIT	VALUE
STONE SIZE	MAXIMUM	20 mm
% PASSING 0.15 mm SIEVE	MAXIMUM	5 %
PLASTICITY INDEX	MAXIMUM	8

RW13. PROVIDE GEOTEXTILE SEPARATION LAYER BETWEEN FREE DRAINING GRANULAR MATERIAL AND RETAINED FILL MATERIAL.

RW14. COMPACTION OF BACKFILL BEHIND WALLS - COMPACTION SHALL BE BY MECHANICAL PLATE VIBRATOR TO A MINIMUM OF 100% STANDARD COMPACTION. - BACKFILLING IS NOT TO TAKE PLACE UNTIL APPROVAL HAS BEEN GIVEN BY THE ENGINEER.

RW15. PROVIDE VERTICAL CONTROL JOINTS IN ALL WALLS AT A MAXIMUM OF 8000 mm CENTRES UNLESS INDICATED OTHERWISE ON THE STRUCTURAL DRAWINGS.

RW16. WHERE EVER POSSIBLE, SURFACE WATER SHALL BE DIRECTED AWAY FROM THE TOP OF THE WALL AND NOT BE ALLOWED TO POND BEHIND THE TOP OF THE WALL OR ENTER THE SUBSURFACE DRAINAGE SYSTEM.

ABBREVIATIONS

ALT	ALTERNATIVE BARS
C/S	BRICKWORK COURSE
BTM	BOTTOM
B	BOTTOM
BJ	BLOCK JOINT
CEN	CENTRAL
CTS	CENTRES
DJ	DOWEL JOINT
EF	EACH FACE
F'c=	CONCRETE STRENGTH
EW	EACH WAY
FF	FAR FACE
NF	NEAR FACE
FFL	FINISH FLOOR LEVEL
GALV	GALVANISED
GD	GRATED DRAIN
GL	GROUND LINE
LV	LENGTH VARIES
LVL	LAMINATED VENEER LUMBER
MC	MASS CONCRETE
NSOE	NOT SHOWN ON ELEVATION
NSOP	NOT SHOWN ON PLAN
RL	REDUCED LEVEL
RC	REINFORCED CONCRETE
(1)	REINFORCEMENT LAID FIRST
(2)	REINFORCEMENT LAID SECOND
(3)	REINFORCEMENT LAID THIRD
(4)	REINFORCEMENT LAID FOURTH
S/S	STAINLESS STEEL
STAG	STAGGERED BARS
SSL	STRUCTURAL SLAB LEVEL
TYP	TYPICAL
T	TOP
U/S	UNDERSIDE
UNO	UNLESS NOTED OTHERWISE
(U+O)	UNDER AND OVER

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Issue

No.	Date	Description	Chkd
1	13.02.2023	SCHEMATIC DESIGN	ZP
2	15.06.2023	50% DESIGN DEVELOPMENT	TB
3	15.09.2023	80% DESIGN DEVELOPMENT	TB
4	22.09.2023	100% DESIGN DEVELOPMENT DRAFT ISSUE	TB

THESE DRAWINGS REPRESENT 100% DETAILED DESIGN OPTION ONLY

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NSW GOVERNMENT Health Infrastructure

Project
CONCORD REPATRIATION GENERAL HOSPITAL
at
109 HOSPITAL ROAD, NSW 2139

for
NSW GOVERNMENT HEALTH & INFRUSTRUCTURE

Drawing Title
NOTES - SHEET 3

Date 25/09/2023 6:21:31 AM
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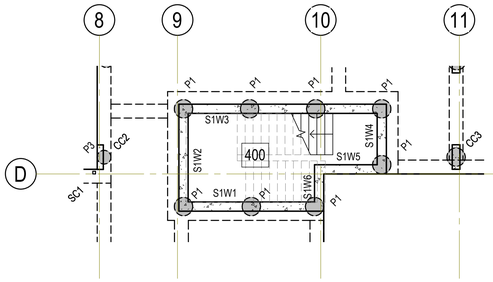
Drawing Reference
22071-S-00.03

Revision
4



GROUND FLOOR GA PLAN - STAIR 1 PART PLAN

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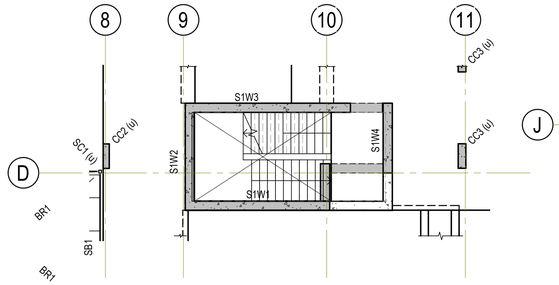

LEVEL 1 GA PLAN - STAIR 1 PART PLAN

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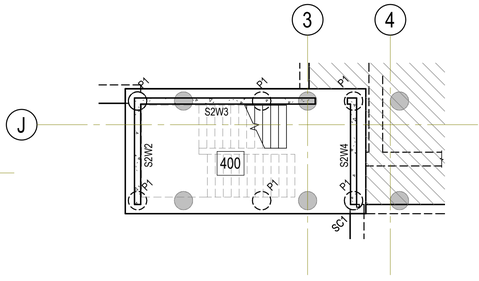
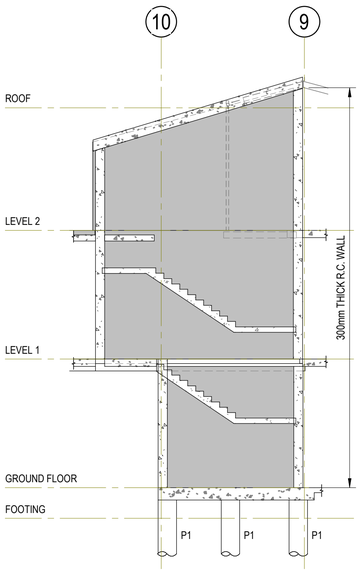


GROUND FLOOR GA PLAN - STAIR 2 PART PLAN

SCALE: 1 : 100

WALL SCHEDULE

MARK	SIZE & TYPE	WALL REINFORCEMENT		COMMENTS
		HORIZONTAL	VERTICAL	
CONCRETE WALL				
CW150	150 CONCRETE WALL	N12-200 EF	N16-200 EF	FRL + 180 min
CW200	200 CONCRETE WALL	N12-200 EF	N16-200 EF	FRL + 180 min
CW300	300 CONCRETE WALL	N12-200 EF	N16-200 EF	FRL + 180 min



S1W1 WALL ELEVATION

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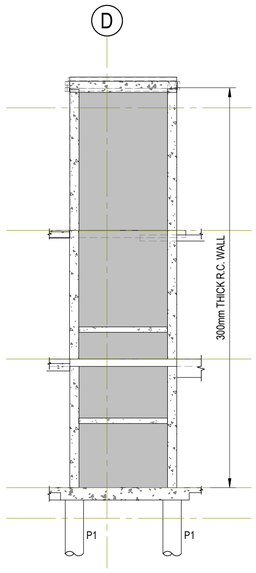

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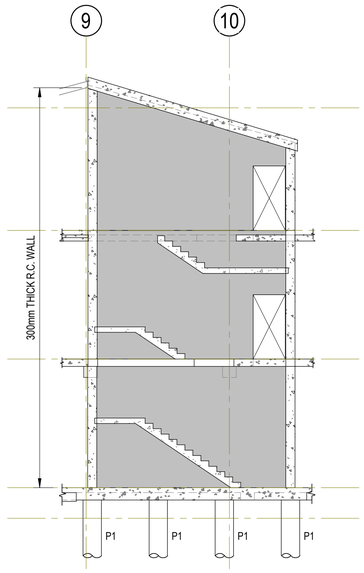

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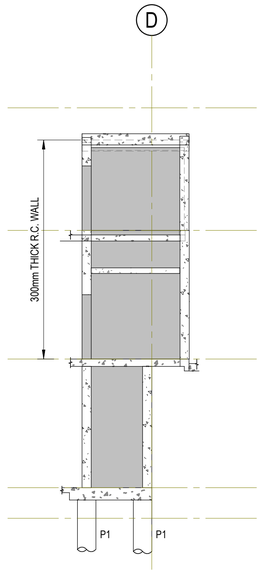

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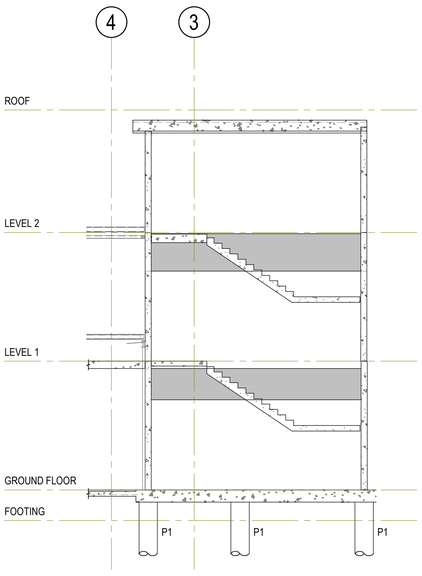

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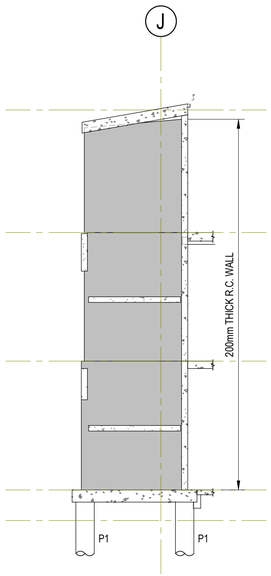

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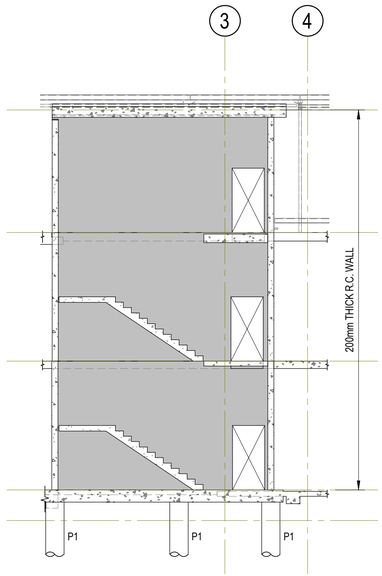

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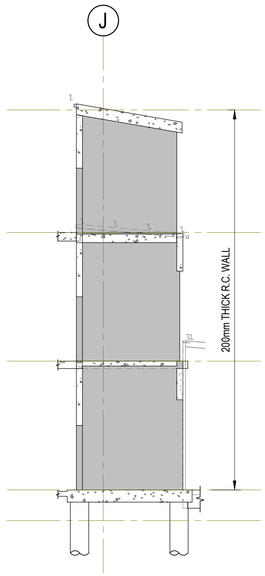

S2W4 WALL ELEVATION

SCALE: 1 : 100

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Client

NSW GOVERNMENT Health Infrastructure

Project

CONCORD REPATRIATION GENERAL HOSPITAL

at

109 HOSPITAL ROAD, NSW 2139

for

NSW GOVERNMENT HEALTH & INFRUSTRUCTURE

Drawing Title

CORE WALL PART PLANS AND ELEVATIONS - SHEET 1

Date 25/09/2023 6:21:32 AM

Scale 1 : 100 @ A1

Drawing Reference

22071-S-02.00

Revision

3

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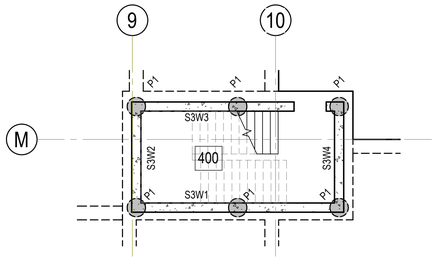

GROUND FLOOR GA PLAN - STAIR 3 PART PLAN

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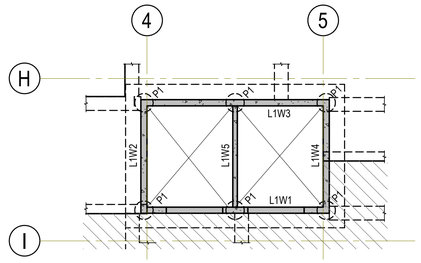

GROUND FLOOR GA PLAN - LIFT 1 PART PLAN

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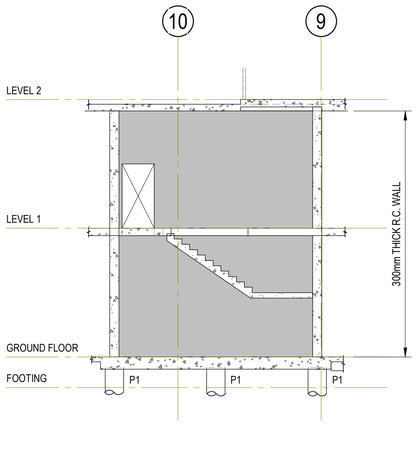

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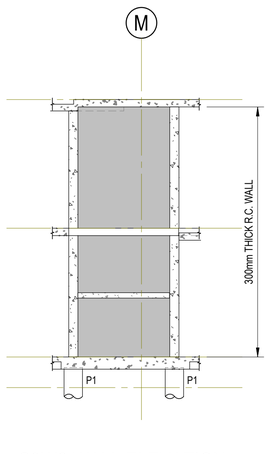

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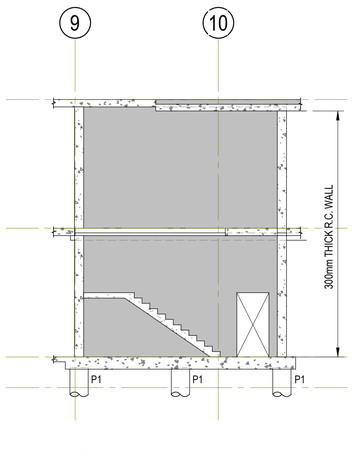
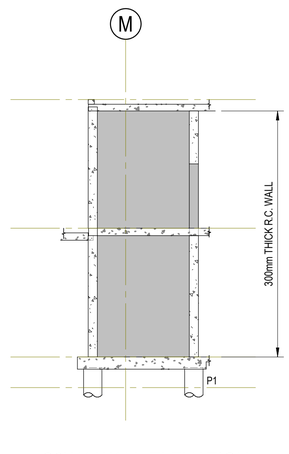


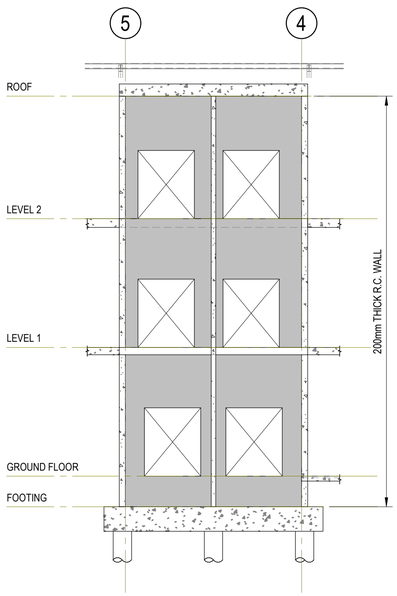
S3W3 WALL ELEVATION

SCALE: 1 : 100



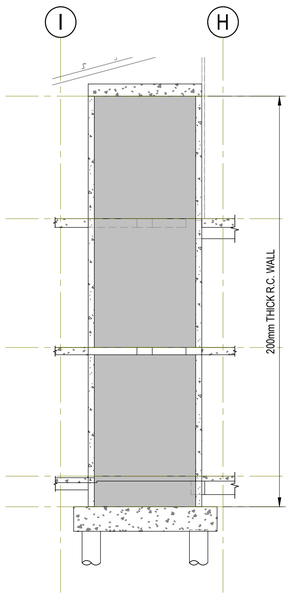
S3W4 WALL ELEVATION

SCALE: 1 : 100



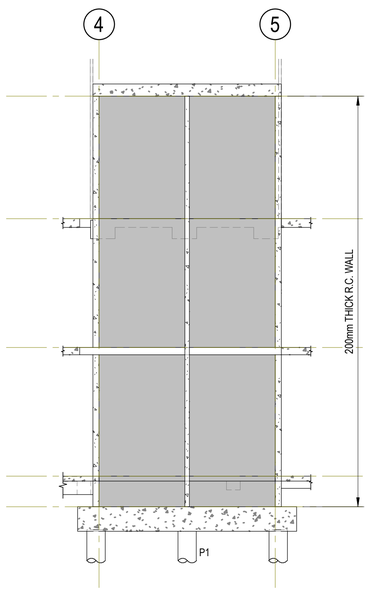
L1W1 WALL ELEVATION

SCALE: 1 : 100



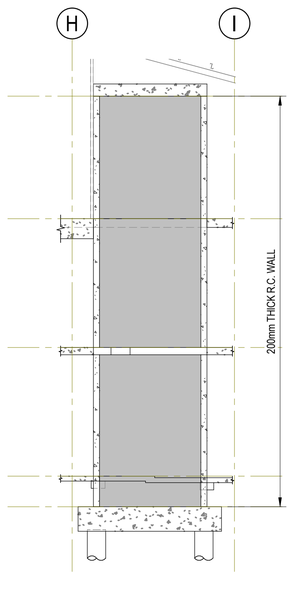
L1W2 WALL ELEVATION

SCALE: 1 : 100



L1W3 WALL ELEVATION

SCALE: 1 : 100



L1W4 WALL ELEVATION

SCALE: 1 : 100

WALL SCHEDULE

MARK	SIZE & TYPE	WALL REINFORCEMENT		COMMENTS
		HORIZONTAL	VERTICAL	
CONCRETE WALL				
CW150	150 CONCRETE WALL	N12-200 EF	N16-200 EF	FRL + 180 min
CW200	200 CONCRETE WALL	N12-200 EF	N16-200 EF	FRL + 180 min
CW300	300 CONCRETE WALL	N12-200 EF	N16-200 EF	FRL + 180 min

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No.	Date	Description	Chkd
1	15.06.2023	50% DESIGN DEVELOPMENT	TB
2	15.09.2023	80% DESIGN DEVELOPMENT	TB
3	22.09.2023	100% DESIGN DEVELOPMENT DRAFT ISSUE	TB

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Project

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for

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Drawing Title

CORE WALL PART PLANS AND ELEVATIONS - SHEET 2

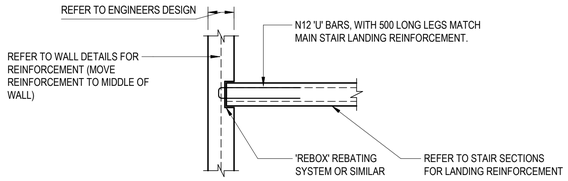
Date 25/09/2023 6:21:33 AM

Scale 1 : 100 @ A1

Drawing Reference

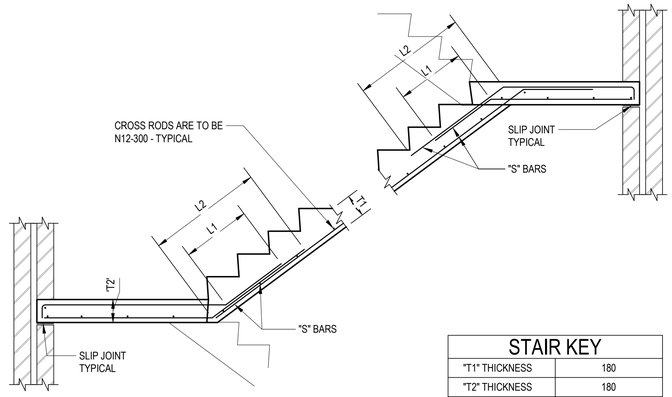
22071-S-02.01

Revision 3



TYPICAL STAIR LANDING DETAIL

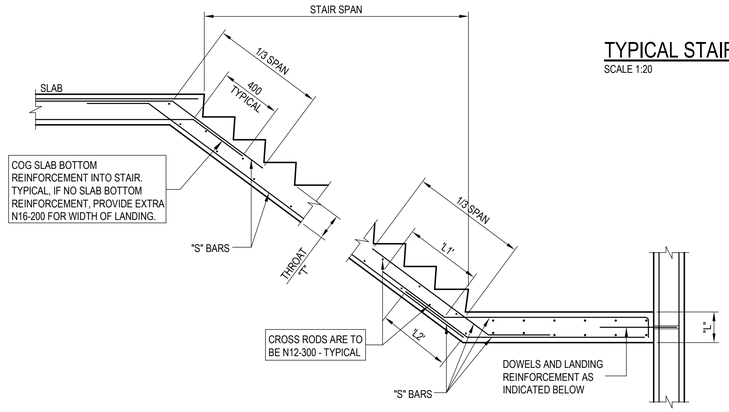
SCALE 1:20

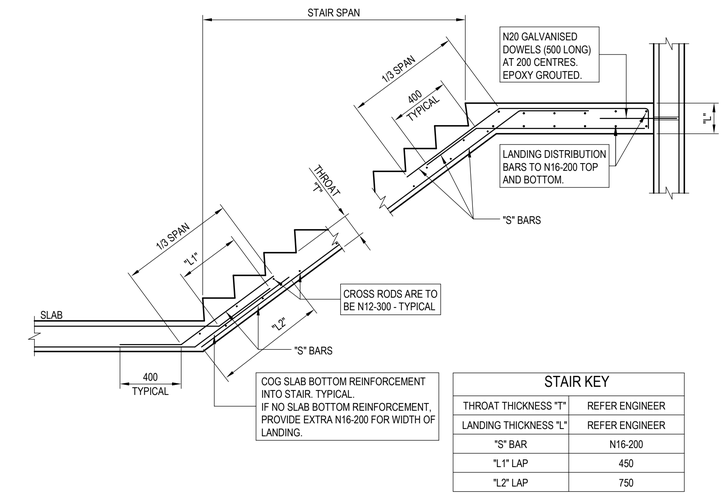


TYPICAL STAIR FLIGHT DETAILS

SCALE 1:20

STAIR KEY	
"T1" THICKNESS	180
"T2" THICKNESS	180
"S" BAR	N16-120
"L1" LAP	450 LAP FOR N16
"L2" LAP	750 LAP FOR N16

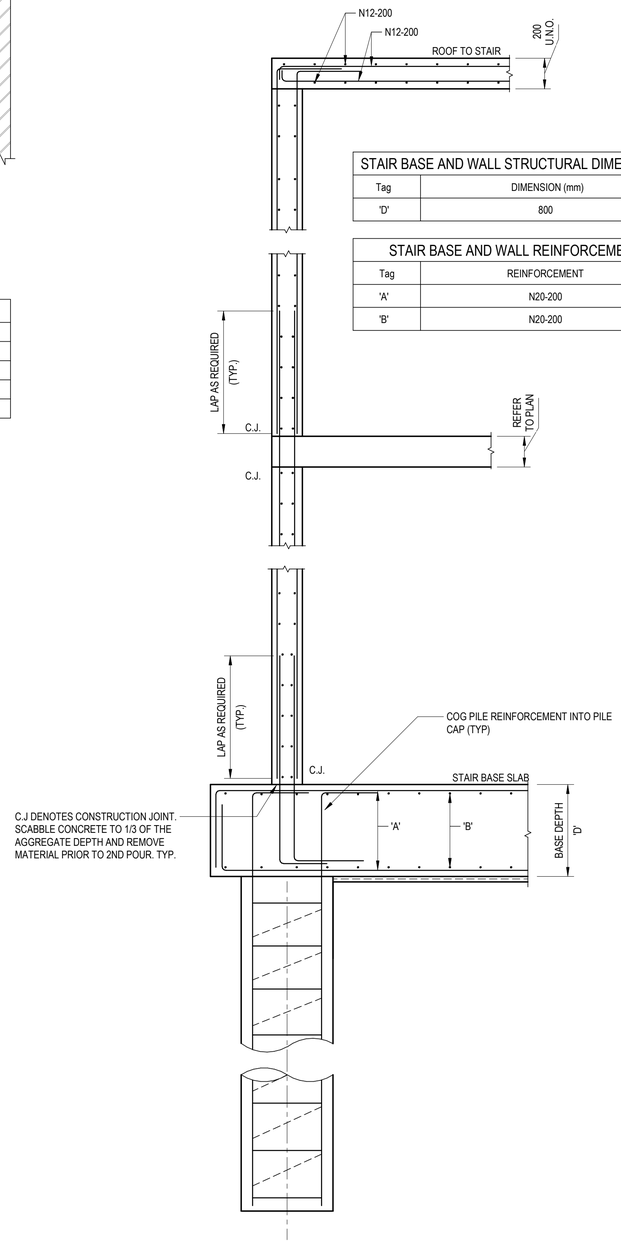




STAIR KEY	
THROAT THICKNESS "T"	REFER ENGINEER
LANDING THICKNESS "L"	REFER ENGINEER
"S" BAR	N16-200
"L1" LAP	450
"L2" LAP	750

TYPICAL STAIR FLIGHT DETAILS

SCALE 1:20



STAIR BASE AND WALL STRUCTURAL DIMENSIONS	
Tag	DIMENSION (mm)
'D'	800

STAIR BASE AND WALL REINFORCEMENT	
Tag	REINFORCEMENT
'A'	N20-200
'B'	N20-200

TYPICAL STAIR WALL AND BASE DETAIL

SCALE 1:20

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Drawing Title

TYPICAL STAIR DETAILS - SHEET 1

Date 25/09/2023 6:21:34 AM

Scale 1 : 20 @ A1

Drawing Reference

22071-S-03.00

Revision

4

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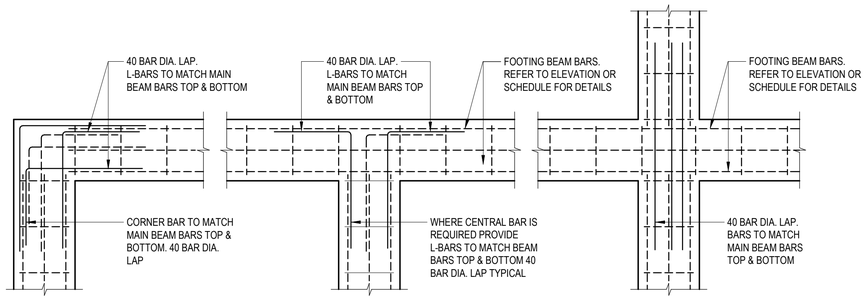
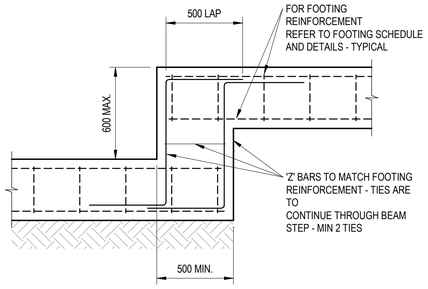


CORNER T-INTERSECTION INTERSECTION

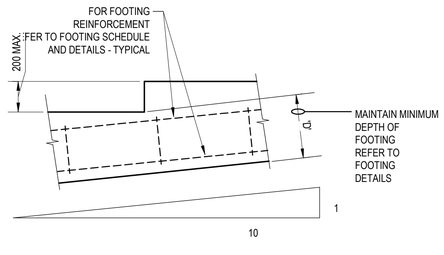
FOOTING BEAM DETAILS

SCALE 1:20



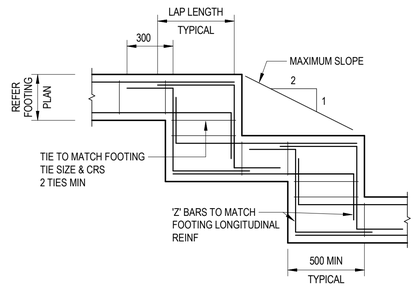
FOOTING BEAM STEP

SCALE 1:20



FOOTING BEAM STEP

SCALE 1:20



FOOTING STEP FOR ABRUPT SLOPES

SCALE 1:20
STEP FOOTING TO SUIT COURSING

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Drawing Title

TYPICAL FOOTING DETAILS - SHEET 1

Date 25/09/2023 6:21:34 AM

Scale 1 : 20 @ A1

Drawing Reference 22071-S-05.00

Revision 4

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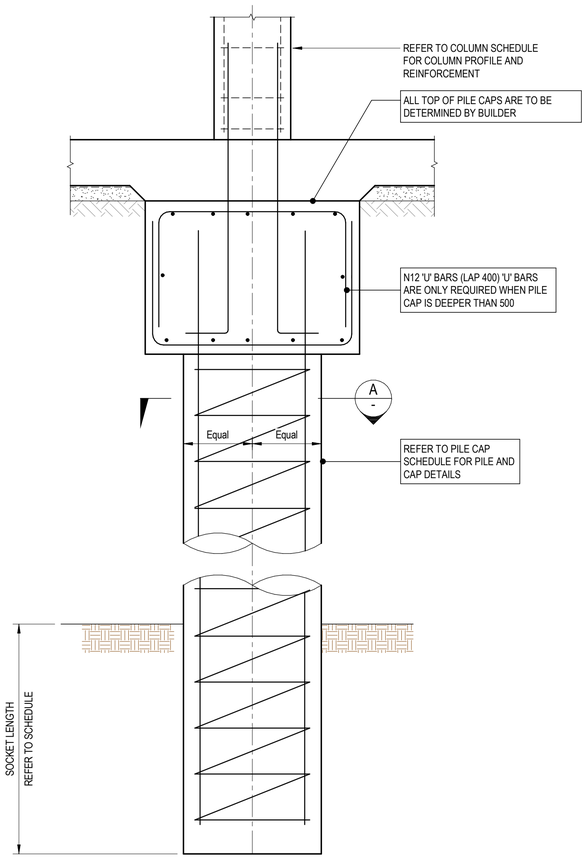
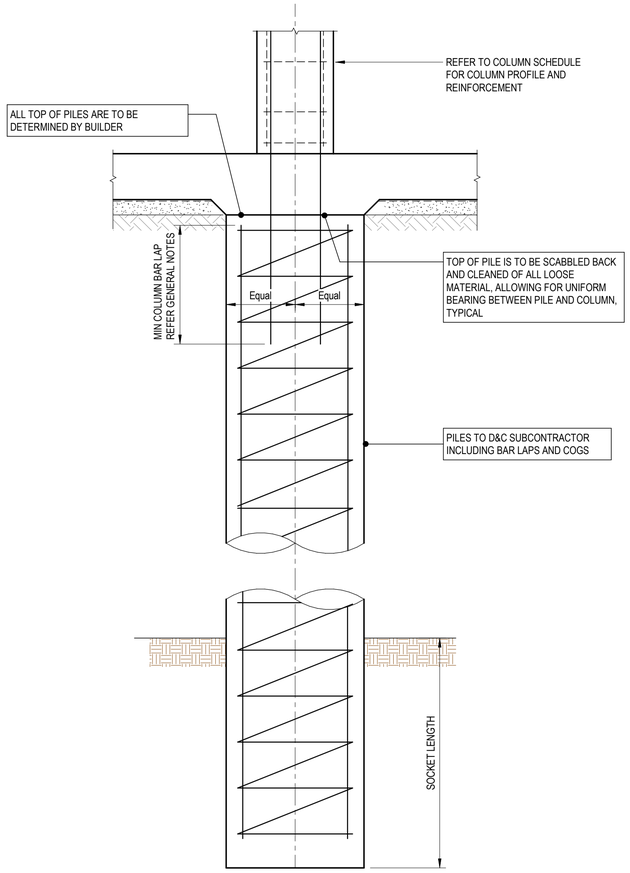


DIAGRAMMATIC PILE CAP DETAIL - SECTION VIEW

SCALE 1:20

1. REFER TO PILE CAP SCHEDULE FOR PILE CAP / PILE DIMENSIONS AND REINFORCEMENT
2. REFER TO GENERAL NOTES FOR MIN BEARING CAPACITY UNDER FOOTINGS
3. REFER TO GENERAL NOTES FOR CONCRETE STRENGTH GRADE



DIAGRAMMATIC PILE / COLUMN DETAIL - SECTION VIEW

SCALE 1:20

1. REFER TO PILE CAP SCHEDULE FOR PILE CAP / PILE DIMENSIONS AND REINFORCEMENT
2. REFER TO GENERAL NOTES FOR MIN BEARING CAPACITY UNDER FOOTINGS
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Drawing Title

TYPICAL FOOTING DETAILS - SHEET 2

Date 25/09/2023 6:21:35 AM

Scale 1 : 20 @ A1

Drawing Reference

22071-S-05.01

Revision

4

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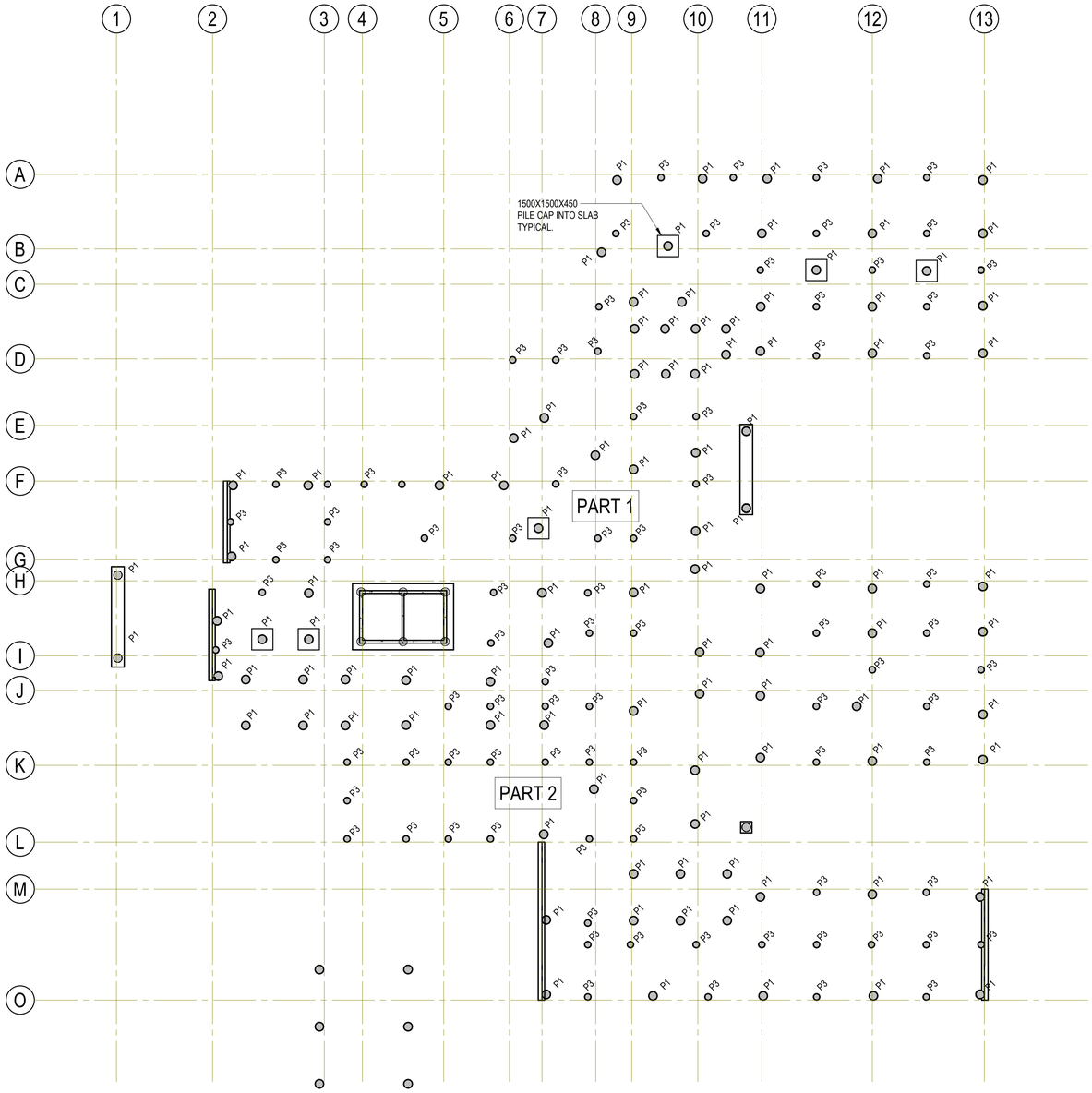

FOOTING OVERALL PLAN

SCALE: 1 : 200

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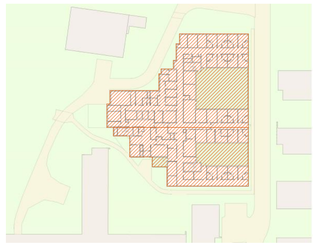

KEY PLAN

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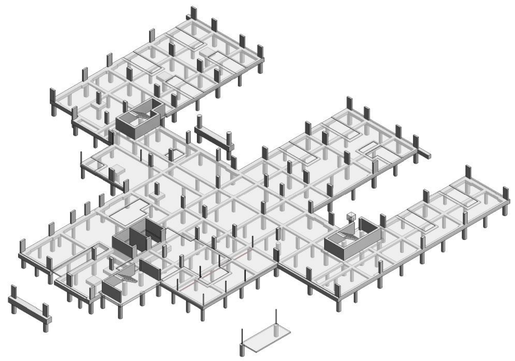

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Drawing Title

FOOTING OVERALL PLAN

Date 25/09/2023 6:25:36 AM

Scale 1 : 200 @ A1

Drawing Reference

22071-S-06.00

Revision 4

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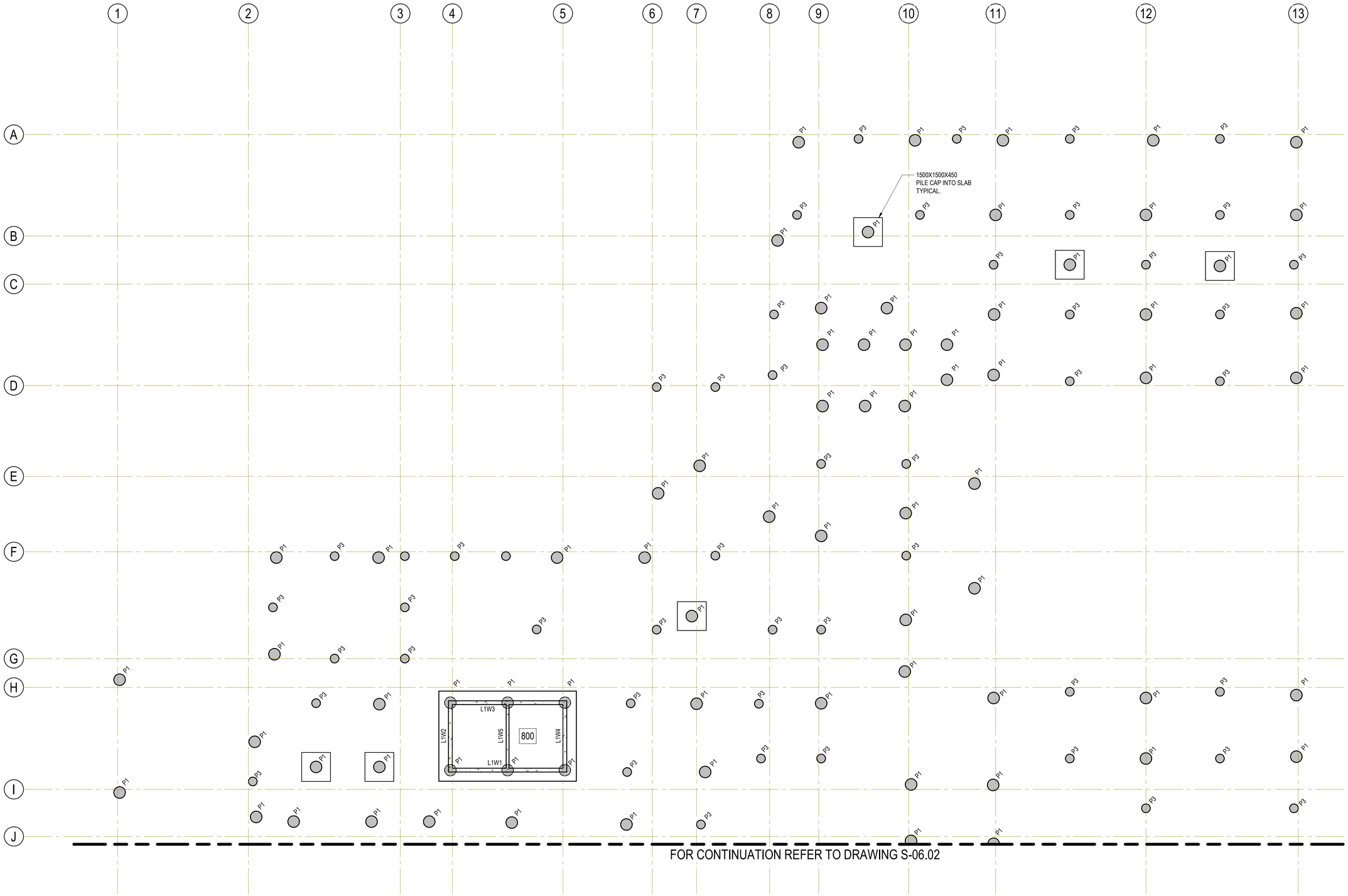

FOOTING GA PLAN - PART 1

SCALE: 1 : 100

FOOTING NOTES:

- REFER TO DRAWINGS S-00.01-S-00.03 FOR ALL STRUCTURAL GENERAL NOTES..
- REFER TO DRAWINGS S-02.00-2-02.01 FOR CONCRETE WALL ELEVATIONS & WALL SCHEDULE.
- REFER TO S-05.00-S-05.01 FOR FOOTING SCHEDULE & TYPICAL DETAILS
- ALL FALLS, SETDOWNS & WATERPROOFING ARE TO ARCHITECTS DETAILS U.N.O.

PILE SCHEDULE

MARK	PILE DIAMETER	WORKING LOAD (kN)	DEAD LOAD (kN)	LIVE LOAD (kN)	ULTIMATE LATERAL LOAD (kN)	ULTIMATE COMPRESSION LOAD (kN)	ULTIMATE TENSION LOAD (kN)	REINFORCEMENT	SOCKET LENGTH (mm)
P1	600								4500
P3	450								4500
									4500

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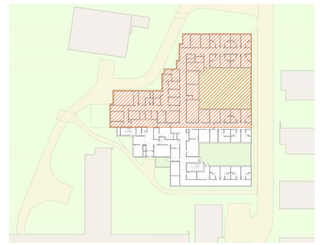

KEY PLAN

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Drawing Title

FOOTING GA PLAN - PART 1

Date 25/09/2023 6:25:38 AM

Scale 1 : 100 @ A1

Drawing Reference

22071-S-06.01

Revision 4

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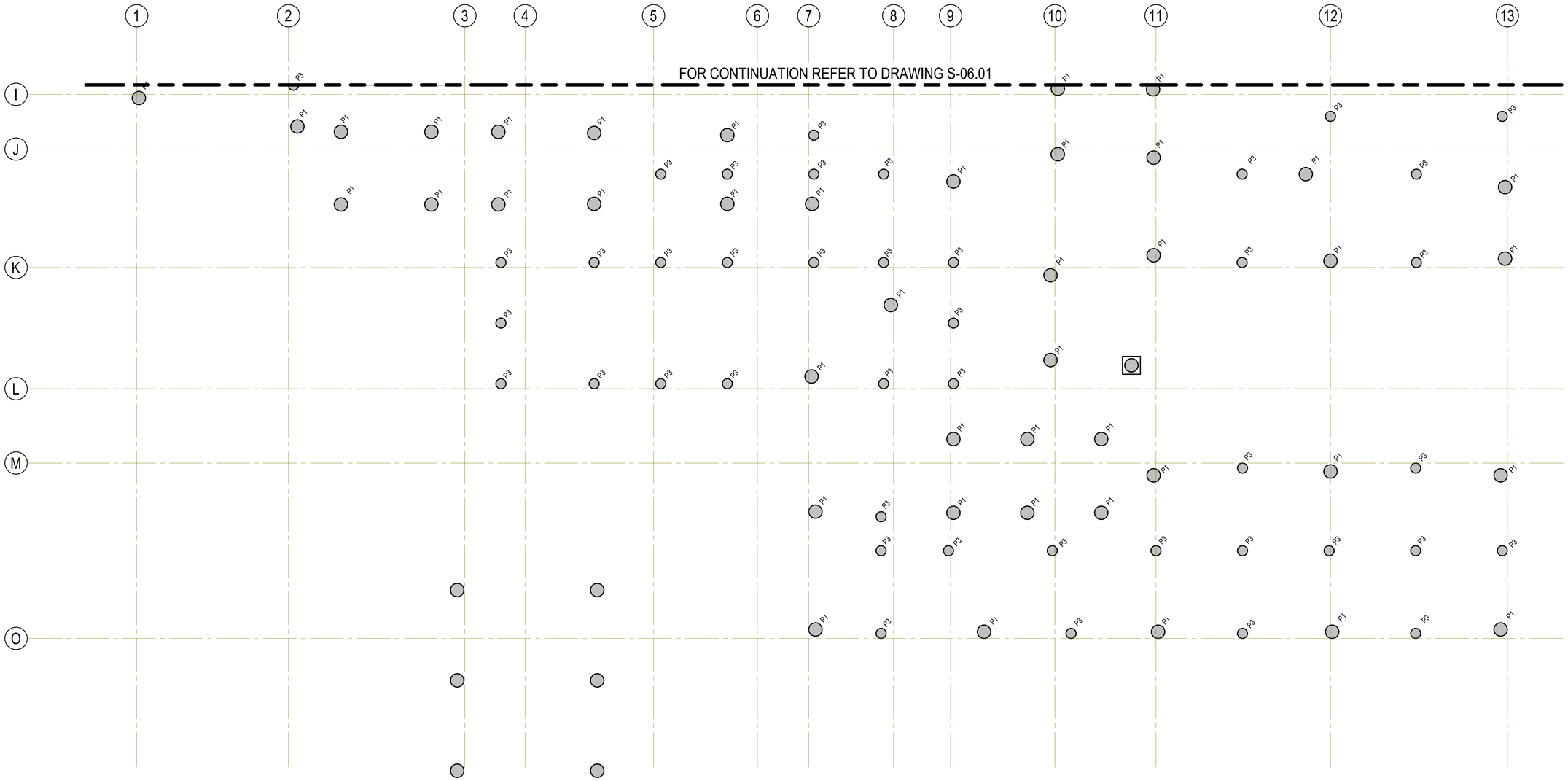

FOOTING GA PLAN - PART 2

SCALE: 1 : 100

FOOTING NOTES:

- REFER TO DRAWINGS S-00.01-S-00.03 FOR ALL STRUCTURAL GENERAL NOTES..
- REFER TO DRAWINGS S-02.00-2-02.01 FOR CONCRETE WALL ELEVATIONS & WALL SCHEDULE.
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P1	600								4500
P3	450								4500
									4500

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Drawing Title
FOOTING GA PLAN - PART 2

Date 25/09/2023 6:25:39 AM
Scale 1 : 100 @ A1

Drawing Reference
22071-S-06.02

Revision
4

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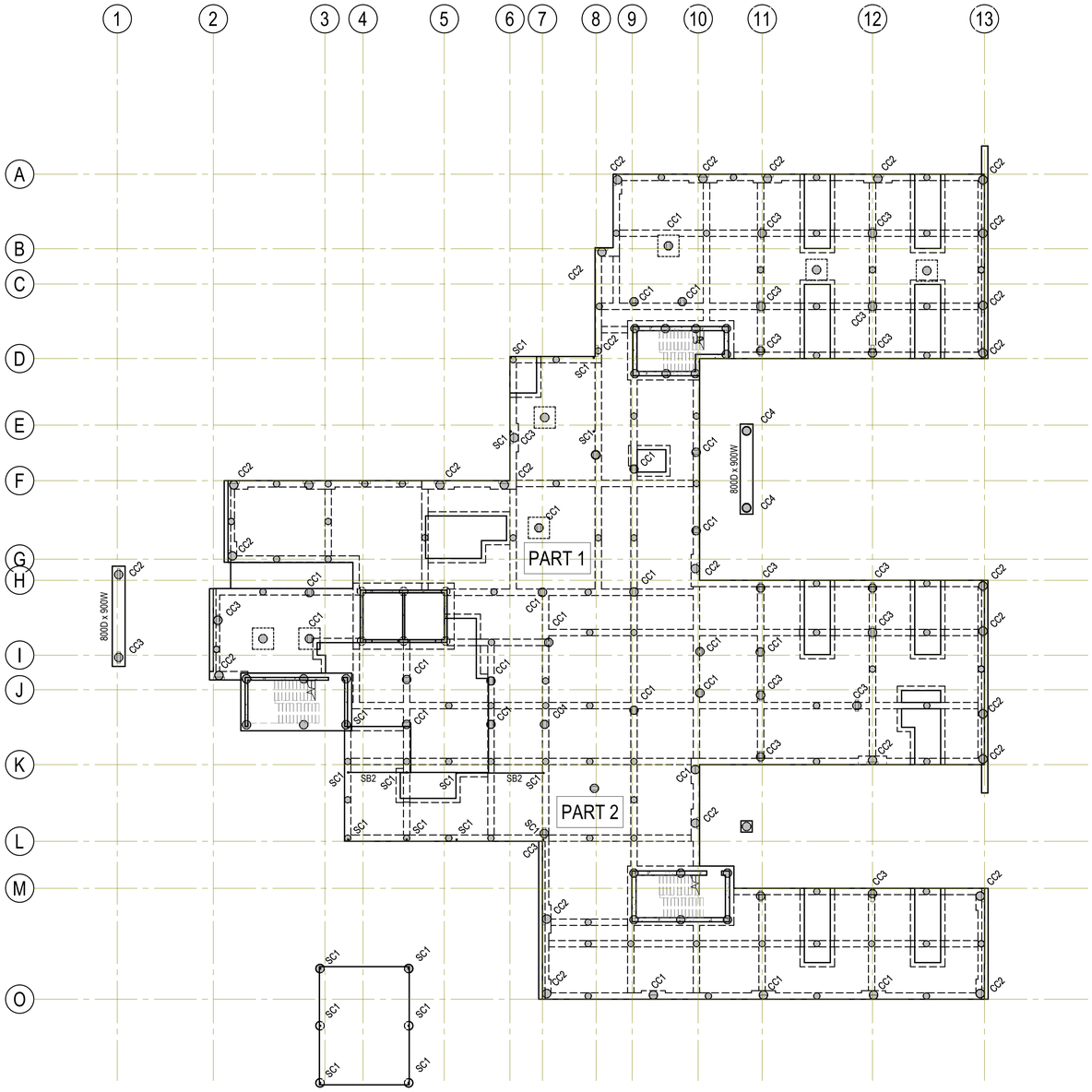

GROUND FLOOR OVERALL PLAN

SCALE: 1 : 200

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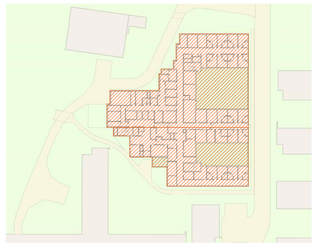

KEY PLAN

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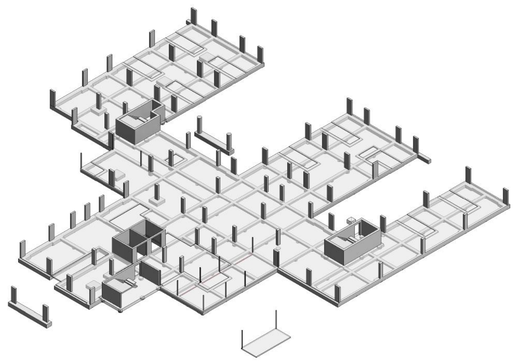

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Drawing Title
GROUND FLOOR OVERALL PLAN

Date 25/09/2023 6:25:44 AM
Scale 1 : 200 @ A1

Drawing Reference
22071-S-07.00

Revision
4

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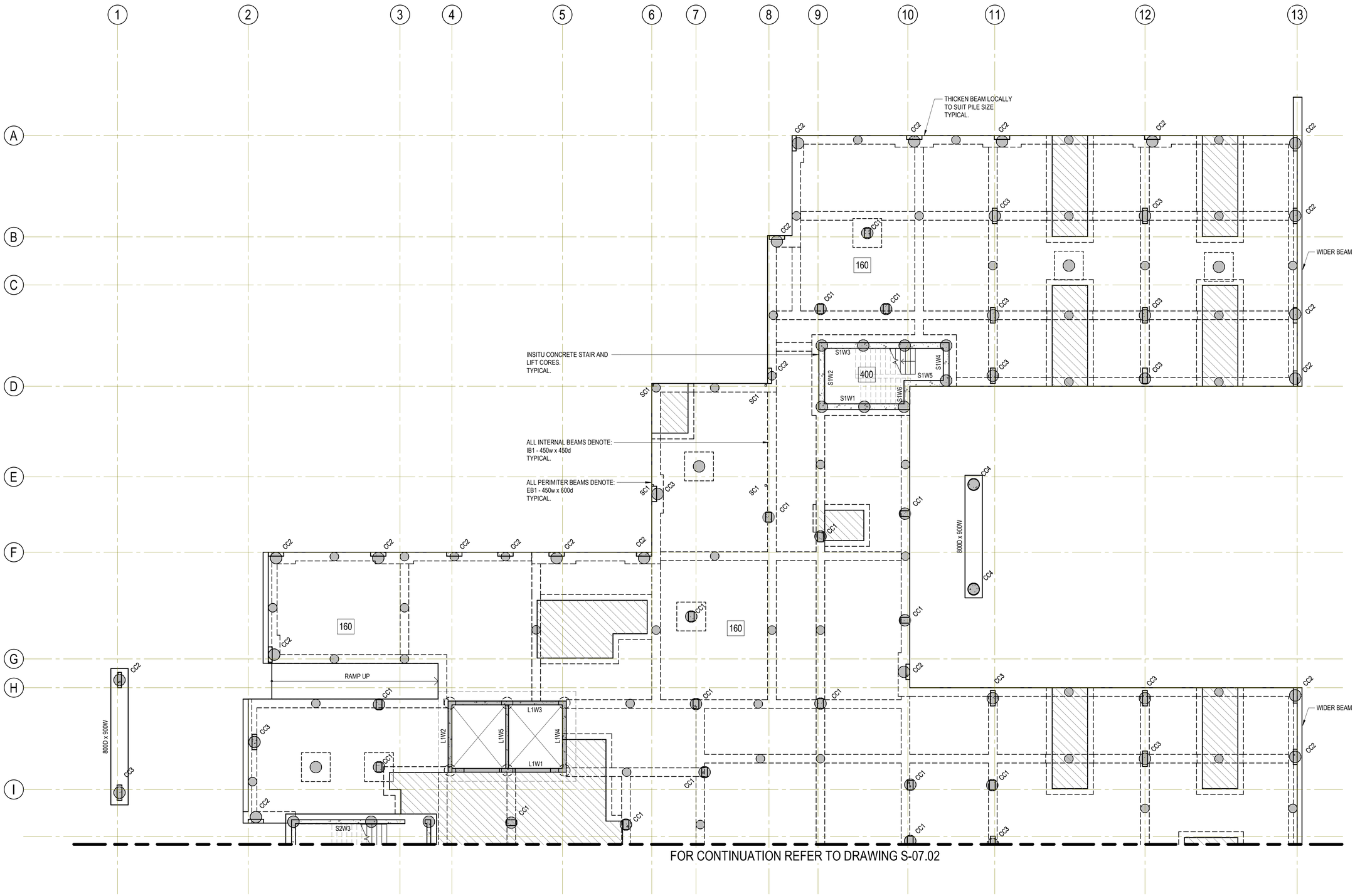

FOR CONTINUATION REFER TO DRAWING S-07.02

GROUND FLOOR GA PLAN - PART 1

SCALE: 1 : 100

LEGEND

200 — DENOTES 160 MIN. SUSPENDED SLAB ON GROUND ALL SLABS ON GROUND ARE TO BE POURED ONTO VAPOUR BARRIER OVERLAYING AN 80mm LAYER OF 20mm SINGLE SIZED FREE DRAINING COMPACTED GRANULAR MATERIAL, SLAB TO BE REINFORCED WITH N16-250 T & B EW THROUGHOUT, f'c = 32MPa

DENOTES SLAB STEP. REFER TO PLAN FOR VARIATION.

HATCH DENOTES 50mm WET AREA SETDOWN

NOTE: (SUSPENDED SLAB)

- REFER TO DRAWINGS 221192-S-00.01-221192-S-00.03 FOR ALL STRUCTURAL GENERAL NOTES.
- REFER TO DRAWINGS S#.## FOR CONCRETE COLUMN SCHEDULE.
- REFER TO DRAWINGS S#.## FOR LOADING DIAGRAMS.
- REFER TO DRAWINGS S-02.00 - S-02.01 FOR CONCRETE WALL ELEVATIONS & WALL SCHEDULE.
- REFER TO ARCHITECTURAL DRAWINGS FOR ALL CONCRETE SETOUT INFORMATION.
- ALL FALLS, SETDOWNS & WATERPROOFING ARE TO ARCHITECTS DETAILS U.N.O.
- UNLESS NOTED OTHERWISE ALL WET AREA SETDOWNS ARE TO BE A MINIMUM 40mm
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CONCRETE COLUMN SCHEDULE

MARK	SIZE	VERTICAL REINFORCEMENT	TIES	CONCRETE STRENGTH (MPa)	COMMENTS
CONCRETE COLUMN					
CC1	300 x 500mm	12N20	N12-200	fc = 40mPa	FRP = 120 MIN.
CC2	200 X 800mm	14N16	N12-200	fc = 40mPa	FRP = 120 MIN (ON SIDE EXPOSED TO FIRE)
CC3	250 x 800mm	14N16	N12-200	fc = 40mPa	FRP = 120 MIN
CC4	Ø600	12N20	N12-200	fc = 40mPa	FRP = 120 MIN.

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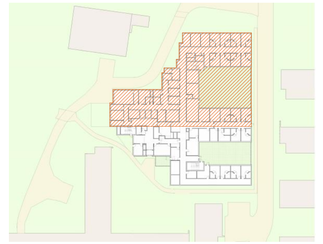
Issue

No.	Date	Description	Chkd
1	13.02.2023	SCHEMATIC DESIGN	ZP
2	15.06.2023	50% DESIGN DEVELOPMENT	TB
3	15.09.2023	80% DESIGN DEVELOPMENT	TB
4	22.09.2023	100% DESIGN DEVELOPMENT DRAFT ISSUE	TB



KEY PLAN

THESE DRAWINGS REPRESENT 100% DETAILED DESIGN OPTION ONLY

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Nominated Architect:
Andrew Duffin NSW 5602
NBRS & Partners Pty Ltd VIC 51197
ABN 16 002 247 565

Client
NSW GOVERNMENT Health Infrastructure

Project
CONCORD REPATRIATION GENERAL HOSPITAL
at
109 HOSPITAL ROAD, NSW 2139
for
NSW GOVERNMENT HEALTH & INFRUSTRUCTURE

Drawing Title
GROUND FLOOR GA PLAN - PART 1

Date 25/09/2023 6:25:46 AM
Scale 1 : 100 @ A1

Drawing Reference
22071-S-07.01

Revision
4

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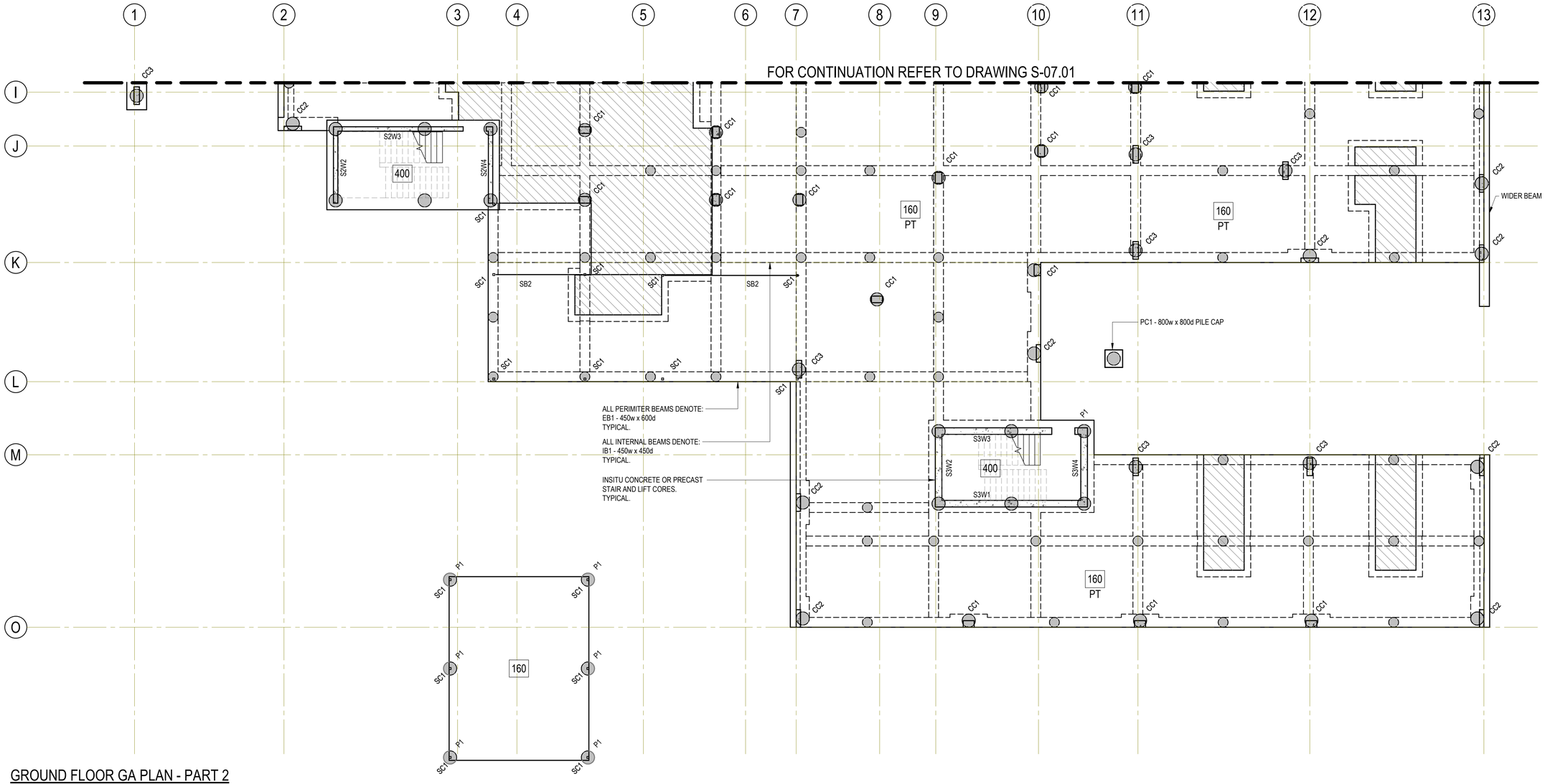

GROUND FLOOR GA PLAN - PART 2

SCALE: 1 : 100

LEGEND

200 PT — SLAB THICKNESS TYPICALLY SHOWN FOR POST TENSION OPTION: DOES NOT INCLUDE 40mm SACRIFICIAL LAYER.

DENOTES SLAB STEP. REFER TO PLAN FOR VARIATION.

HATCH DENOTES 50mm WET AREA SETDOWN

NOTE: (SUSPENDED SLAB)

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CONCRETE COLUMN SCHEDULE

MARK	SIZE	VERTICAL REINFORCEMENT	TIES	CONCRETE STRENGTH (MPa)	COMMENTS
CONCRETE COLUMN					
CC1	300 x 500mm	12N20	N12-200	fc = 40mPa	FRP = 120 MIN.
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CC3	250 x 800mm	14N16	N12-200	fc = 40mPa	FRP = 120 MIN
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4	22.09.2023	100% DESIGN DEVELOPMENT DRAFT ISSUE	TB

KEY PLAN

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Client
NSW GOVERNMENT Health Infrastructure

Project
CONCORD REPATRIATION GENERAL HOSPITAL
at
109 HOSPITAL ROAD, NSW 2139
for
NSW GOVERNMENT HEALTH & INFRUSTRUCTURE

Drawing Title
GROUND FLOOR GA PLAN - PART 2

Date 25/09/2023 6:25:49 AM
Scale 1 : 100 @ A1

Drawing Reference
22071-S-07.02

Revision
4

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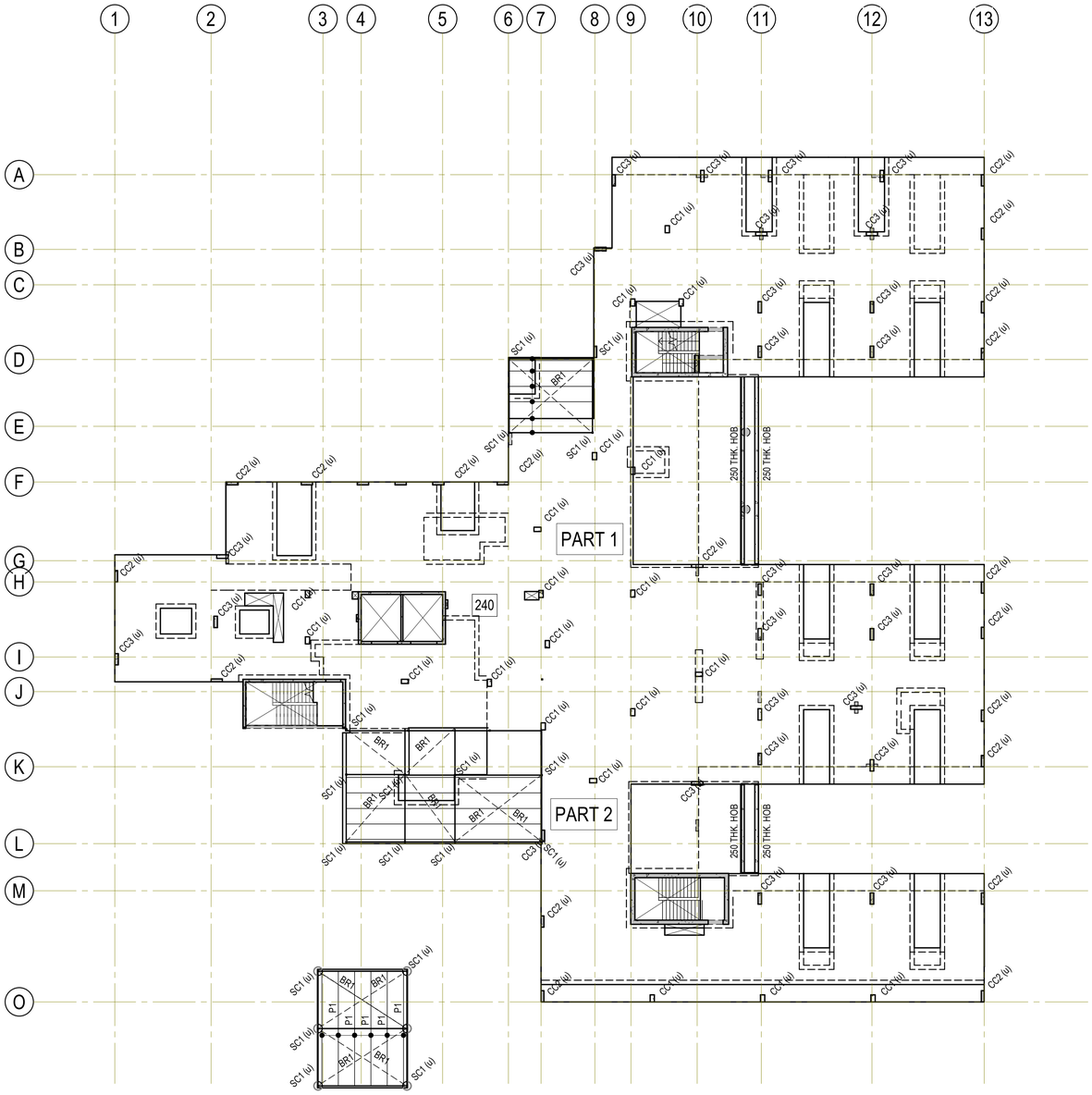

LEVEL 1 OVERALL PLAN

SCALE: 1 : 200

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Issue

No.	Date	Description	Chkd
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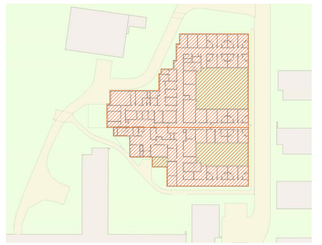
4	22.09.2023	100% DESIGN DEVELOPMENT DRAFT ISSUE	TB



KEY PLAN

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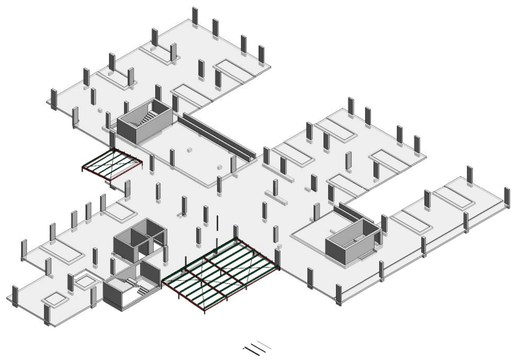

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NSW GOVERNMENT Health Infrastructure

Project

CONCORD REPATRIATION GENERAL HOSPITAL

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109 HOSPITAL ROAD, NSW 2139

for

NSW GOVERNMENT HEALTH & INFRUSTRUCTURE

Drawing Title

LEVEL 1 OVERALL PLAN

Date 25/09/2023 6:25:52 AM

Scale 1 : 200 @ A1

Drawing Reference

22071-S-07.10

Revision 4

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LEVEL 1 GA PLAN - PART 1

SCALE: 1 : 100

LEGEND

200 / PT — SLAB THICKNESS TYPICALLY SHOWN FOR POST TENSION OPTION: DOES NOT INCLUDE 40mm SACRIFICIAL LAYER.

DENOTES SLAB STEP. REFER TO PLAN FOR VARIATION.

HATCH DENOTES 50mm WET AREA SETDOWN

NOTE: (SUSPENDED SLAB)

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STEEL COLUMN SCHEDULE

MARK	SIZE	COMMENTS
SC1	89 x 89 x 5 SHS	

FRAMING SCHEDULE

MARK	SIZE	COMMENTS
SB1	200UB25.4	
P1	Z15024	
SB2	89 x 89 x 5 SHS	

CONCRETE COLUMN SCHEDULE

MARK	SIZE	VERTICAL REINFORCEMENT	TIES	CONCRETE STRENGTH (MPa)	COMMENTS
CONCRETE COLUMN					
CC1	300 x 500mm	12N20	N12-200	fc = 40mPa	FRP = 120 MIN.
CC2	200 X 800mm	14N16	N12-200	fc = 40mPa	FRP = 120 MIN (ON SIDE EXPOSED TO FIRE)
CC3	250 x 800mm	14N16	N12-200	fc = 40mPa	FRP = 120 MIN
CC4	Ø600	12N20	N12-200	fc = 40mPa	FRP = 120 MIN.

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Issue

No.	Date	Description	Chkd
1	13.02.2023	SCHEMATIC DESIGN	ZP
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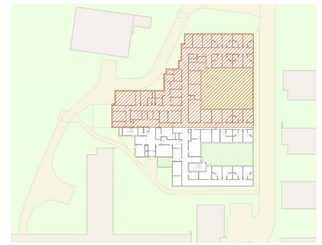

KEY PLAN

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Client
NSW GOVERNMENT Health Infrastructure

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at
109 HOSPITAL ROAD, NSW 2139
for
NSW GOVERNMENT HEALTH & INFRUSTRUCTURE

Drawing Title
LEVEL 1 GA PLAN - PART 1

Date 25/09/2023 6:25:54 AM
Scale 1 : 100 @ A1

Drawing Reference
22071-S-07.11

Revision
4

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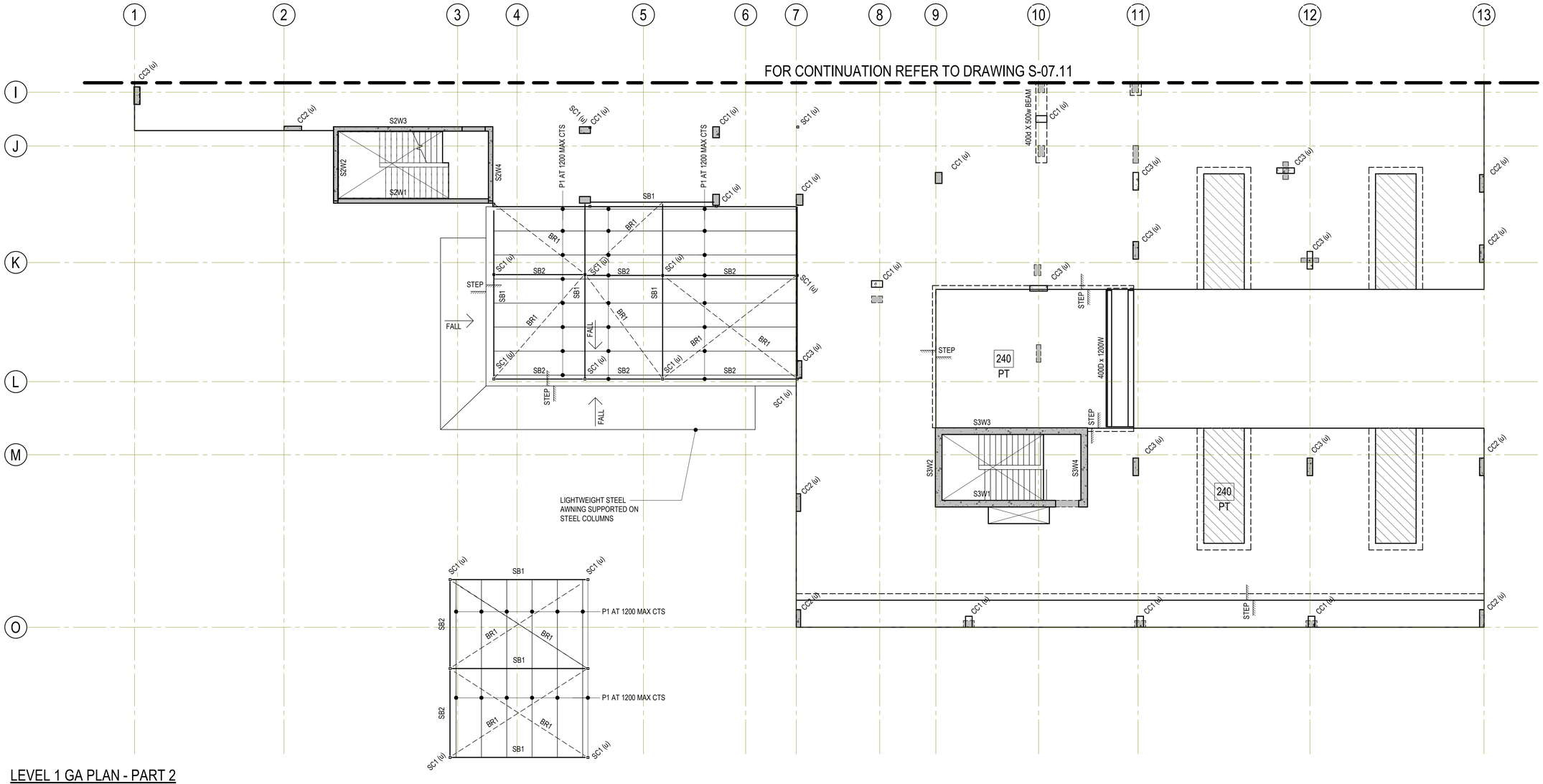

LEVEL 1 GA PLAN - PART 2

SCALE: 1 : 100

LEGEND

200 PT — SLAB THICKNESS TYPICALLY SHOWN FOR POST TENSION OPTION: DOES NOT INCLUDE 40mm SACRIFICIAL LAYER.

DENOTES SLAB STEP. REFER TO PLAN FOR VARIATION.

HATCH DENOTES 50mm WET AREA SETDOWN

NOTE: (SUSPENDED SLAB)

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CONCRETE COLUMN SCHEDULE

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CONCRETE COLUMN					
CC1	300 x 500mm	12N20	N12-200	fc = 40mPa	FRP = 120 MIN.
CC2	200 X 800mm	14N16	N12-200	fc = 40mPa	FRP = 120 MIN (ON SIDE EXPOSED TO FIRE)
CC3	250 x 800mm	14N16	N12-200	fc = 40mPa	FRP = 120 MIN
CC4	Ø600	12N20	N12-200	fc = 40mPa	FRP = 120 MIN.

STEEL COLUMN SCHEDULE

MARK	SIZE	COMMENTS
SC1	89 x 89 x 5 SHS	

FRAMING SCHEDULE

MARK	SIZE	COMMENTS
SB1	200UB25.4	
P1	Z15024	
SB2	89 x 89 x 5 SHS	

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Issue

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KEY PLAN

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Client

NSW GOVERNMENT Health Infrastructure

Project

CONCORD REPATRIATION GENERAL HOSPITAL

at

109 HOSPITAL ROAD, NSW 2139

for

NSW GOVERNMENT HEALTH & INFRUSTRUCTURE

Drawing Title

LEVEL 1 GA PLAN - PART 2

Date 25/09/2023 6:25:56 AM

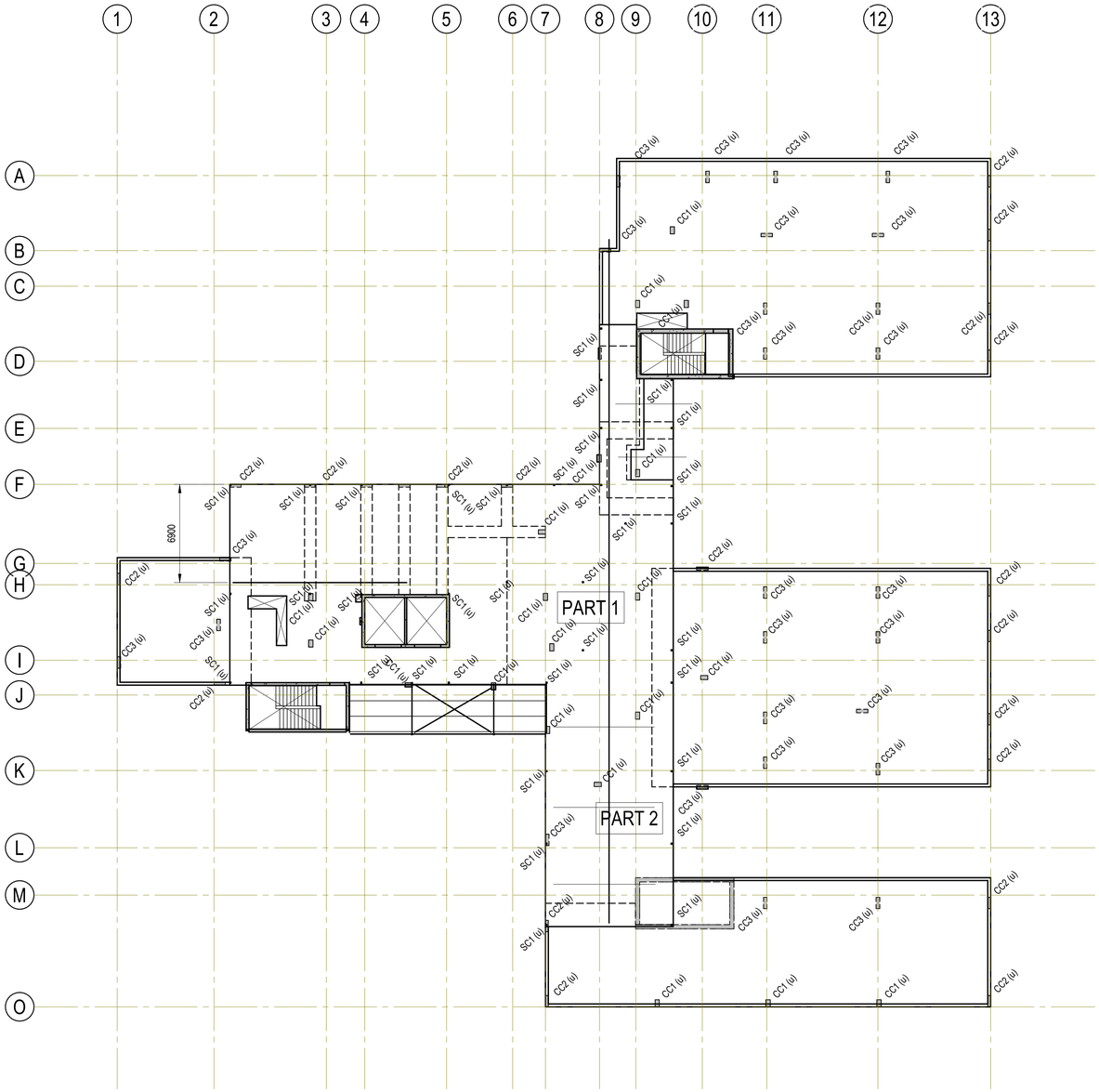
Scale 1 : 100 @ A1

Drawing Reference

22071-S-07.12

Revision

4



LEVEL 2 OVERALL PLAN

SCALE: 1 : 200

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Issue

No.	Date	Description	Chkd
1	13.02.2023	SCHEMATIC DESIGN	ZP
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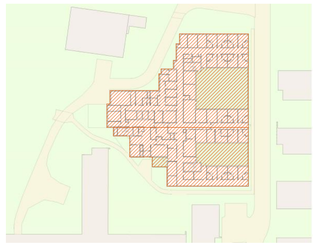
4	22.09.2023	100% DESIGN DEVELOPMENT DRAFT ISSUE	TB



KEY PLAN

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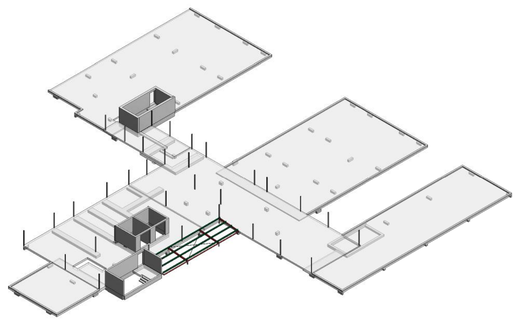

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NSW GOVERNMENT Health Infrastructure

Project
CONCORD REPATRIATION GENERAL HOSPITAL
at
109 HOSPITAL ROAD, NSW 2139

for
NSW GOVERNMENT HEALTH & INFRUSTRUCTURE

Drawing Title
LEVEL 2 OVERALL PLAN

Date 25/09/2023 6:27:09 AM
Scale 1 : 200 @ A1

Drawing Reference
22071-S-07.20

Revision
4

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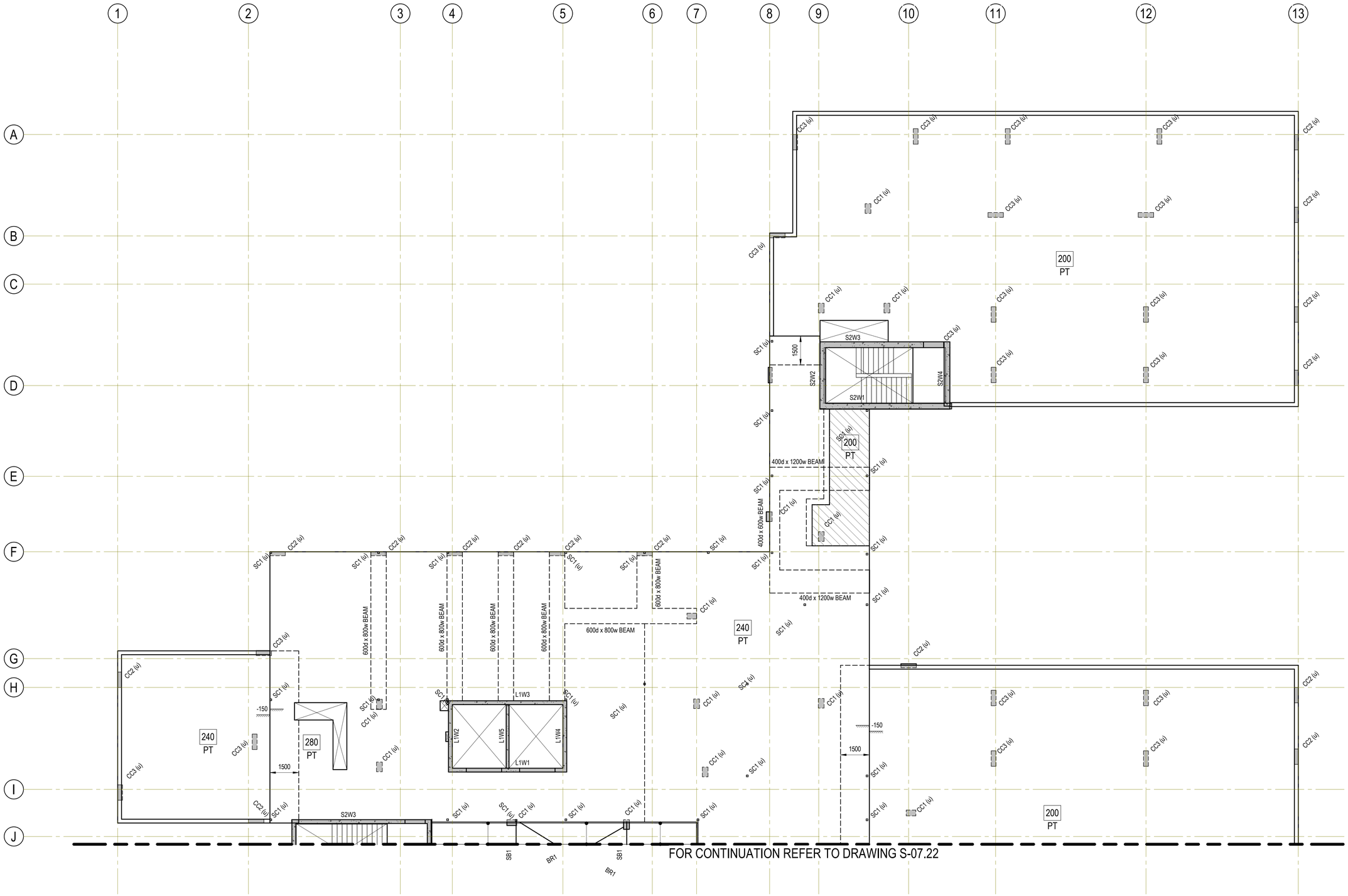

LEVEL 2 GA PLAN - PART 1

SCALE: 1 : 100

LEGEND

200 PT — SLAB THICKNESS TYPICALLY SHOWN FOR POST TENSION OPTION: DOES NOT INCLUDE 40mm SACRIFICIAL LAYER.

DENOTES SLAB STEP. REFER TO PLAN FOR VARIATION.

HATCH DENOTES 50mm WET AREA SETDOWN

NOTE: (SUSPENDED SLAB)

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STEEL COLUMN SCHEDULE

MARK	SIZE	COMMENTS
SC1	89 x 89 x 5 SHS	

FRAMING SCHEDULE

MARK	SIZE	COMMENTS
SB1	200UB25.4	
P1	Z15024	
SB2	89 x 89 x 5 SHS	

CONCRETE COLUMN SCHEDULE

MARK	SIZE	VERTICAL REINFORCEMENT	TIES	CONCRETE STRENGTH (MPa)	COMMENTS
CONCRETE COLUMN					
CC1	300 x 500mm	12N20	N12-200	fc = 40mPa	FRP = 120 MIN.
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Issue

No.	Date	Description	Chkd
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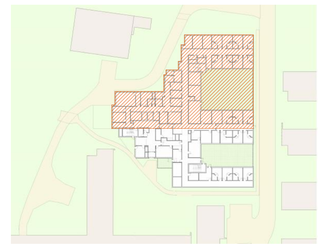

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Client
NSW GOVERNMENT Health Infrastructure

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at
109 HOSPITAL ROAD, NSW 2139
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Drawing Title
LEVEL 2 GA PLAN - PART 1

Date 25/09/2023 6:27:12 AM
Scale 1 : 100 @ A1

Drawing Reference
22071-S-07.21

Revision
4

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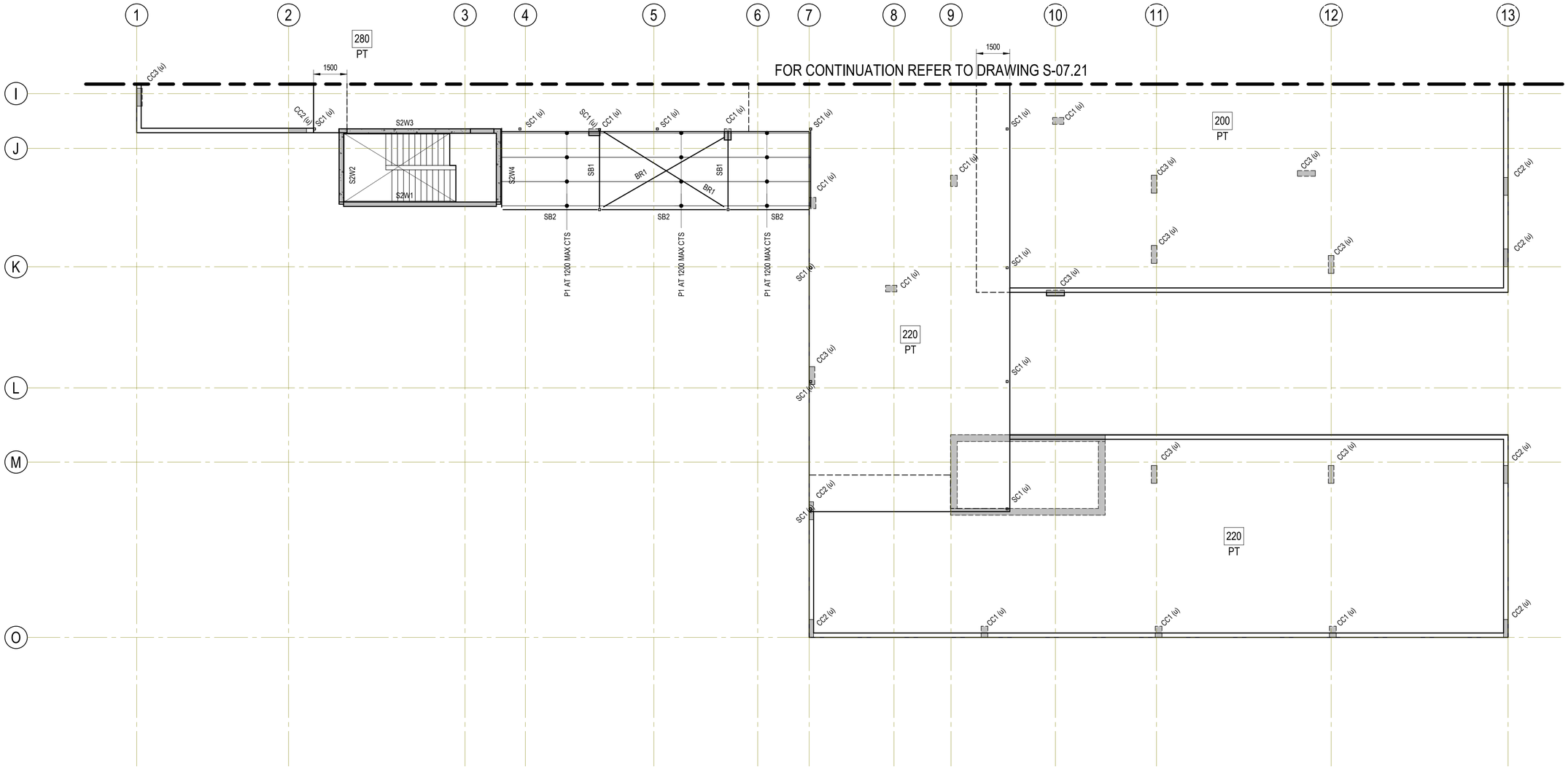

LEVEL 2 GA PLAN - PART 2

SCALE: 1 : 100

LEGEND

200 PT — SLAB THICKNESS TYPICALLY SHOWN FOR POST TENSION OPTION: DOES NOT INCLUDE 40mm SACRIFICIAL LAYER.

DENOTES SLAB STEP. REFER TO PLAN FOR VARIATION.

HATCH DENOTES 50mm WET AREA SETDOWN

NOTE: (SUSPENDED SLAB)

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CC4	Ø600	12N20	N12-200	fc = 40mPa	FRP = 120 MIN.

STEEL COLUMN SCHEDULE

MARK	SIZE	COMMENTS
SC1	89 x 89 x 5 SHS	

FRAMING SCHEDULE

MARK	SIZE	COMMENTS
SB1	200UB25.4	
P1	Z15024	
SB2	89 x 89 x 5 SHS	

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for

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Drawing Title

LEVEL 2 GA PLAN - PART 2

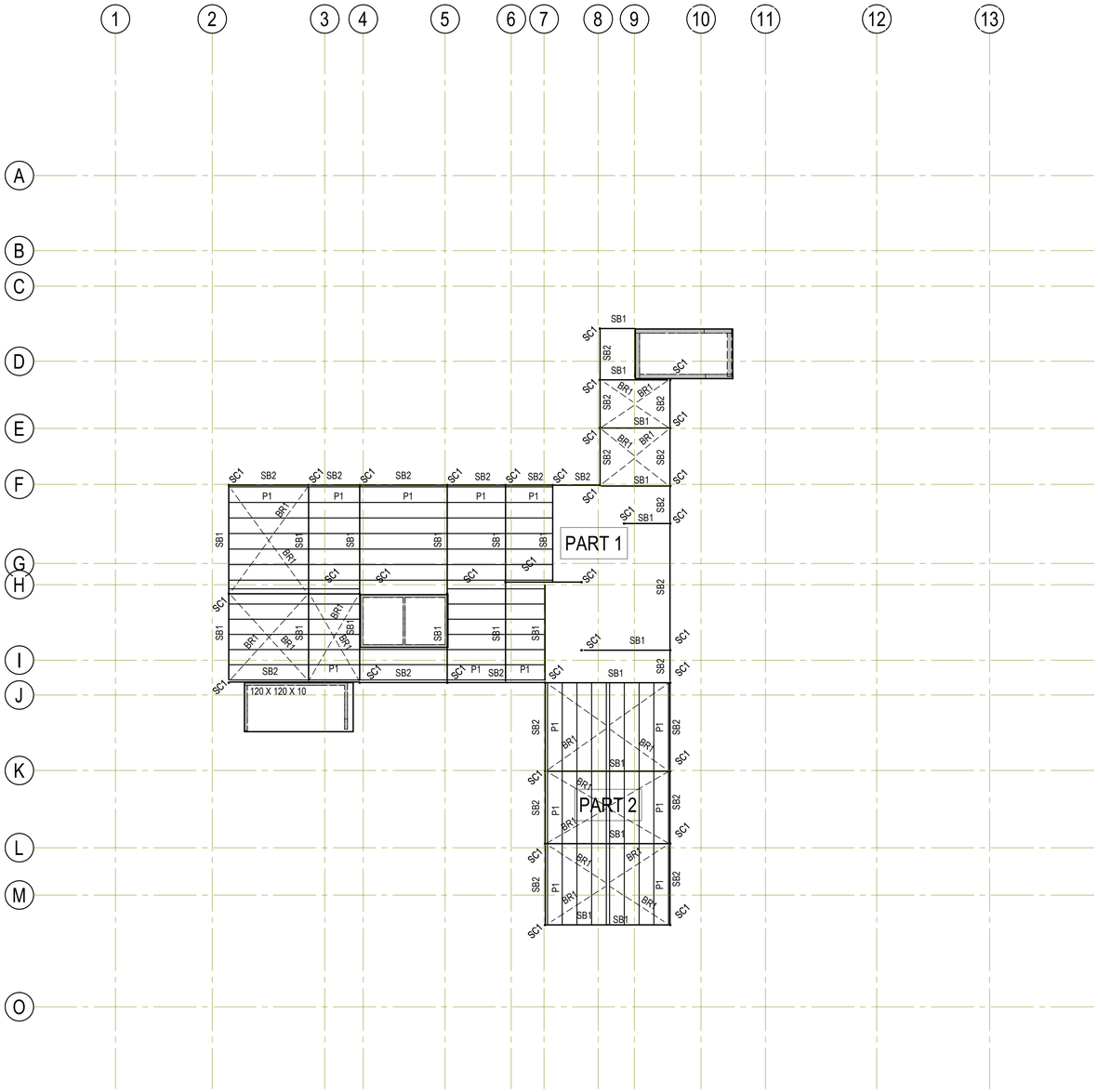
Date 25/09/2023 6:27:14 AM

Scale 1 : 100 @ A1

Drawing Reference

22071-S-07.22

Revision 4



ROOF OVERALL PLAN

SCALE: 1 : 200

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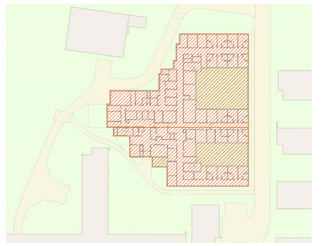
Issue

No.	Date	Description	Chkd
1	13.02.2023	SCHEMATIC DESIGN	ZP
2	15.06.2023	50% DESIGN DEVELOPMENT	TB
3	15.09.2023	80% DESIGN DEVELOPMENT	TB
4	22.09.2023	100% DESIGN DEVELOPMENT DRAFT ISSUE	TB



KEY PLAN

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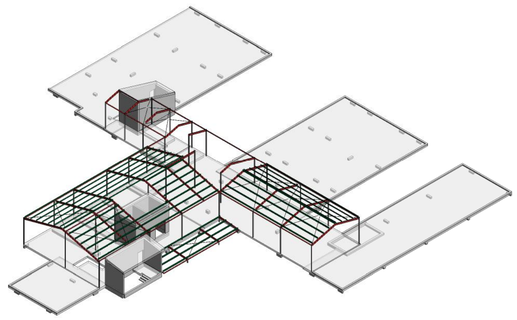

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Client
NSW GOVERNMENT Health Infrastructure

Project
CONCORD REPATRIATION GENERAL HOSPITAL
at
109 HOSPITAL ROAD, NSW 2139

for
NSW GOVERNMENT HEALTH & INFRUSTRUCTURE

Drawing Title
ROOF OVERALL PLAN

Date 25/09/2023 6:28:46 AM
Scale 1 : 200 @ A1

Drawing Reference
22071-S-07.30

Revision
4

0 10 20 30 40 50 60 70 80 90 100

ROOF GA PLAN - PART 1

SCALE: 1 : 100

NOTE: LIGHT GAUGE STEEL ROOF TRUSS SYSTEM AND ASSOCIATED STRUCTURE.
LIGHT GAUGE STEEL ROOF TRUSS SYSTEM BY D & C CONCTRACTOR. TYPICAL.
PROPRIETRY LIGHT GUAGE STEEL TRUSSES ARE TO BE DESIGNED, INSPECTED AFTER ERRECTION AND CERTIFIED BY A STRUCTURAL ENGINEER ENGAGED BY THE FABRICATOR OR BUILDER. CERTIFICATION SHALL INCLUDE ROOF BRACING AND TIE DOWN TO SUPPORTS.
THE DESIGN SHALL COMPLY WITH ASNZS 4600.
THE FABRICATOR SHALL PROVIDE LAYOUT DRAWINGS TO ACOR FOR CONFIRMATION OF ALL DESIGN ASSUMPTIONS FOR THE SUPPORTING STURCTURE (INCLUDING REACTIONS TO BE SUSTAINED BY MAIN STRUCTURE).
THE DESIGN OF THE TRUSSES TO BE COORDINATED WITH ALL SERVICE DISCIPLINES TO INCLUDE BUT NOT LIMITED TO THE FOLLOWING: POSITION AND WEIGHT OF EQUIPTMENT AND DUCTING. TYPICAL.
TRUSS DESIGN SHALL ALSO ACCOUNT FOR ALL PV PANELS AS SPECIFIED ON MECHANICAL ENGINEERS DOCUMENTATION

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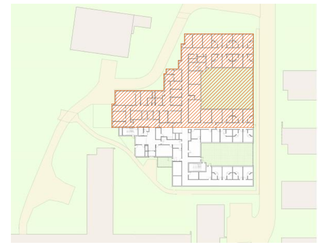

KEY PLAN

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Drawing Title
ROOF GA PLAN - PART 1

Date 25/09/2023 6:28:48 AM
Scale 1 : 100 @ A1

Drawing Reference
22071-S-07.31

Revision
4

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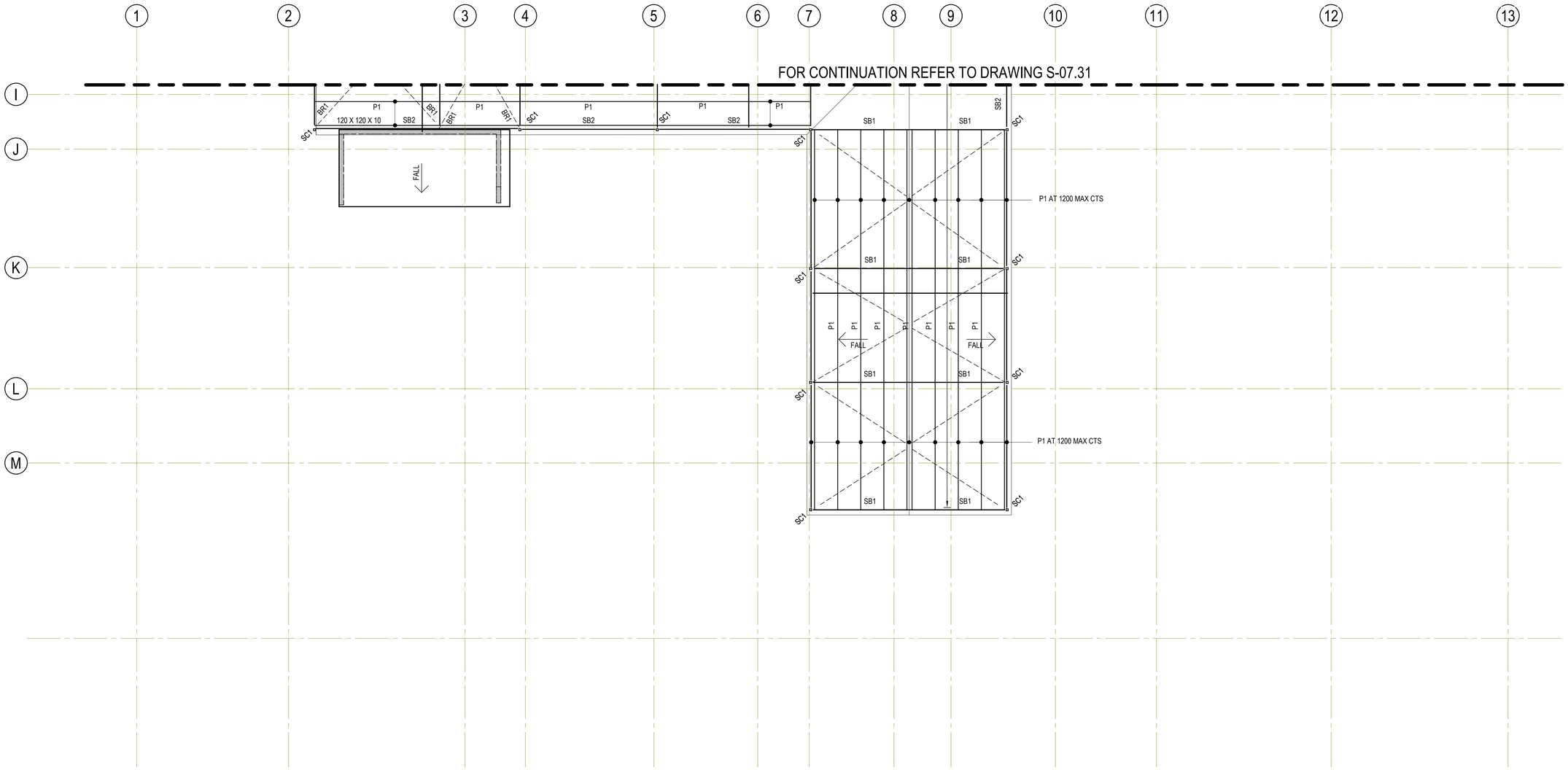

ROOF GA PLAN - PART 2

SCALE: 1 : 100

NOTE: LIGHT GAUGE STEEL ROOF TRUSS SYSTEM AND ASSOCIATED STRUCTURE.
LIGHT GAUGE STEEL ROOF TRUSS SYSTEM BY D & C CONCTRACTOR. TYPICAL.
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KEY PLAN

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Drawing Title
ROOF GA PLAN - PART 2

Date 25/09/2023 6:28:48 AM
Scale 1 : 100 @ A1

Drawing Reference
22071-S-07.32

Revision
4

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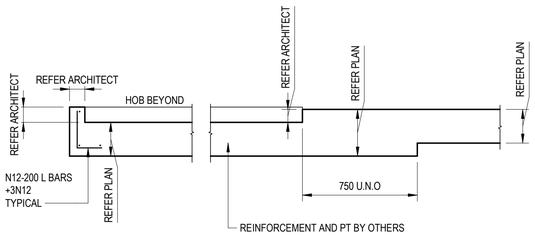
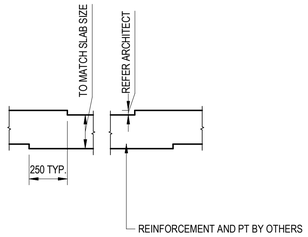
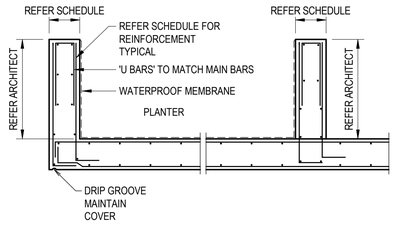


TYPICAL BALCONY DETAIL

(HOB NOT SHOWN ON PLAN, REFER TO ARCHITECTS)

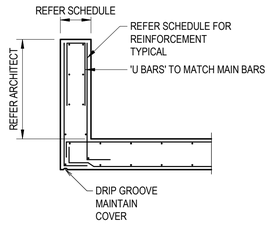


TYPICAL WET AREA DETAIL



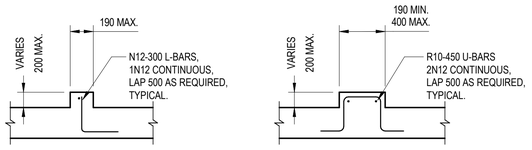
TYPICAL PLANTER DETAIL

SCALE 1:20



TYPICAL UPSTAND DETAIL

SCALE 1:20



TYPICAL HOB 'H1' DETAILS

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Drawing Title

TYPICAL SUSPENDED SLAB DETAILS - SHEET 1

Date 25/09/2023 6:28:49 AM

Scale 1 : 20 @ A1

Drawing Reference

22071-S-13.01

Revision 4

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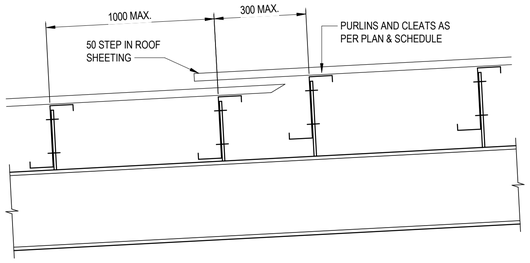
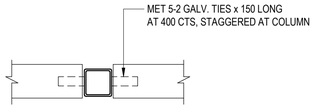
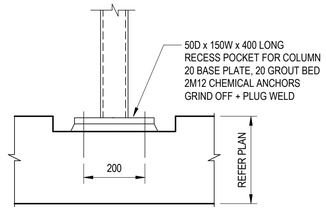


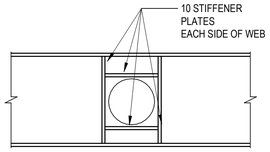
TYPICAL STEP TO ROOF SHEETING
SCALE
1:10



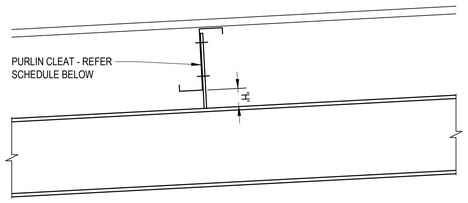
TYPICAL SHS TO BRICKWORK DETAIL
SCALE 1:10



TYPICAL COLUMN RECESS DETAIL
SCALE 1:10



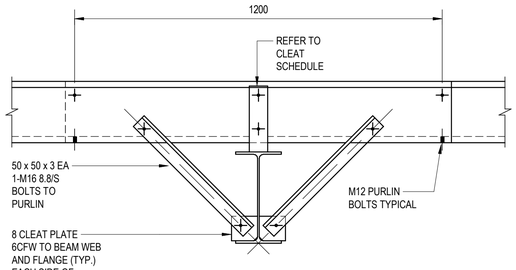
TYPICAL PENETRATION THROUGH BEAM DETAIL
SCALE 1:10



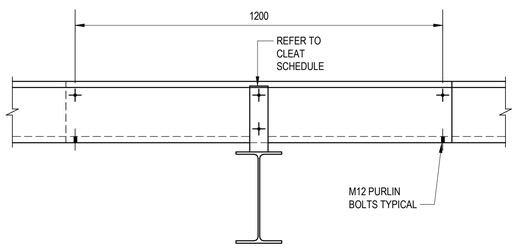
TYPICAL PURLIN CLEAT CONNECTION
SCALE
1:10

PURLIN CLEAT SCHEDULE

"H"	MIN CLEAT SIZE (SPLICED PURLIN)	MIN CLEAT SIZE (CONT PURLIN)
UPTO 50	130 x 8 PLATE	75 x 8 PLATE
UPTO 100	130 x 10 PLATE	75 x 10 PLATE
UPTO 150	130 x 12 PLATE	75 x 12 PLATE
150 + (500 MAX)	150 x 90 x 8 UA	75 x 75 x 6 EA



TYPICAL FLY-BRACE DETAIL TO BEAM (FB)
SCALE
1:10



TYPICAL ROOF PURLIN CONNECTION DETAIL
SCALE
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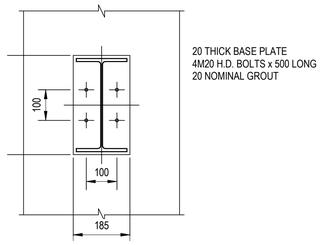
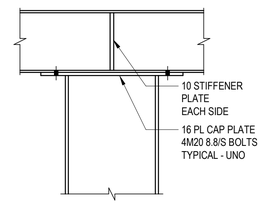
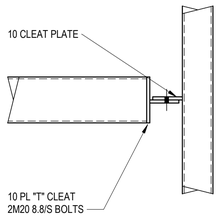


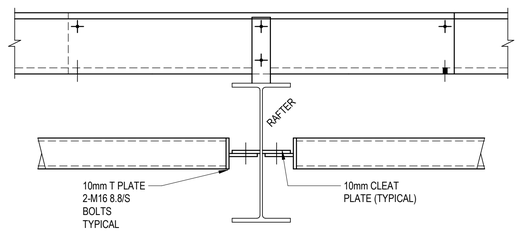
TYPICAL BEAM TO CONCRETE DETAIL
SCALE 1:10



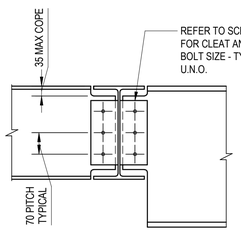
TYPICAL COLUMN CAP PLATE DETAIL
SCALE 1:10



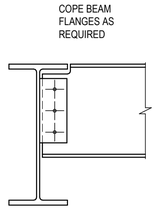
TYPICAL RHS,CHS,SHS BEAM END CONNECTION
SCALE 1:10



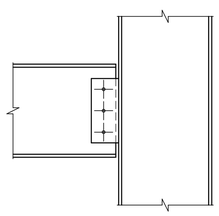
TYPICAL RHS/CHS/SHS BEAM TO RAFTER DETAIL
SCALE
1:10



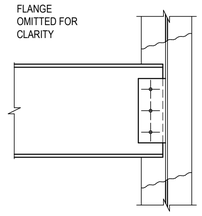
BEAM TO BEAM DETAIL



BEAM TO BEAM DETAIL



BEAM TO BEAM COLUMN



BEAM TO BEAM COLUMN

MINIMUM WEB CLEAT CONNECTION DETAILS U.N.O.
SCALE 1:10

WEB CLEAT SCHEDULE

BEAM SIZE	CONNECTION ULTIMATE SHEAR CAP.	WEB CLEAT	BOLTS
180UB OR 180 PFC	50 kN	10 PLATE	2M20 8.8/S
200UB/UC OR 200 PFC / 230 PFC	60 kN	10 PLATE	2M20 8.8/S
250UB/UC OR 250 PFC	85 kN	10 PLATE	2M20 8.8/S
310UB/UC OR 300 PFC	140 kN	10 PLATE	3M20 8.8/S
360UB OR 380 PFC	175 kN	10 PLATE	3M20 8.8/S
410UB	260 kN	10 PLATE	4M20 8.8/S
460UB	260 kN	10 PLATE	4M20 8.8/S
530UB	360 kN	10 PLATE	5M20 8.8/S
610UB	440 kN	12 PLATE	6M20 8.8/S

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Drawing Title
TYPICAL STEEL DETAILS - SHEET 1

Date 25/09/2023 6:28:49 AM
Scale 1 : 10 @ A1
Drawing Reference
22071-S-14.00
Revision
3

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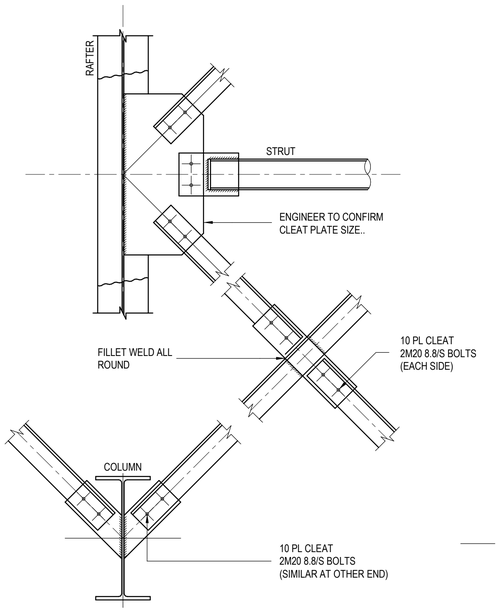
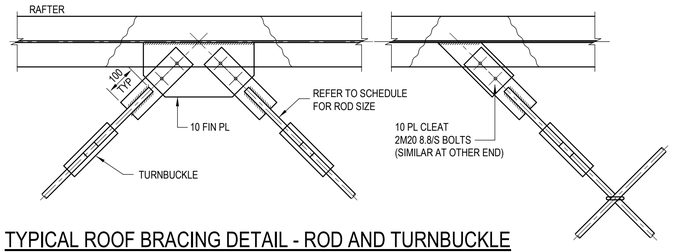


TYPICAL ROOF BRACING DETAIL - ANGLE

SCALE 1:10
(DENOTED BR ON PLAN)
BRACING TO BE HUNG FROM PURLINS AS INDICATED IN SCHEDULE

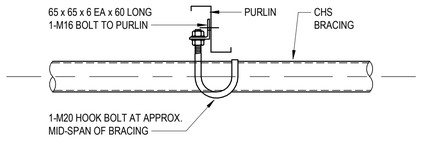
D - STEEL DETAILS 1 TO 10 SHEET 1 - SHEET 2

SCALE: 1 : 10



TYPICAL ROOF BRACING DETAIL - ROD AND TURNBUCKLE

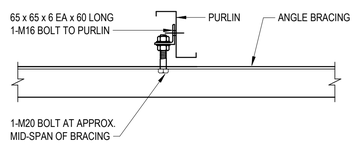
SCALE 1:10
(DENOTED BR ON PLAN)



ROOF BRACE SUPPORT DETAIL

SCALE
1:10

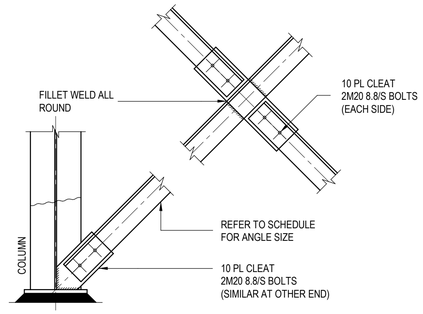
NOTES:
1. CENTRELINE OF BRACING TO BE 75 MINIMUM BELOW TOP FLANGE OF ROOF BEAMS
2. TYPICAL BRACING CONNECTION 2-M16 8.8/S BOLTS 10mm CLEAT PLATE



ROOF BRACE SUPPORT DETAIL

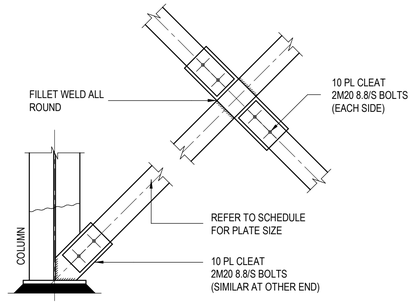
SCALE
1:10

NOTES:
1. TOP ANGLE TO LINE UP WITH TOP OF ROOF BEAMS
2. TYPICAL BRACING CONNECTION 2-M16 8.8/S BOLTS 10mm CLEAT PLATE



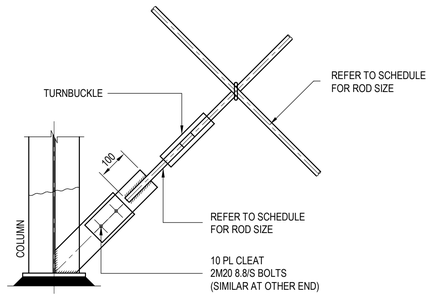
TYPICAL WALL BRACING DETAIL - ANGLE

SCALE 1:10
(DENOTED VB ON PLAN)



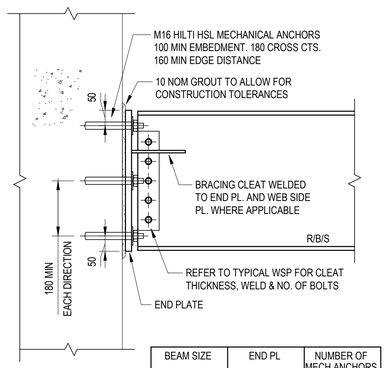
TYPICAL WALL BRACING DETAIL - PLATE

SCALE 1:10
(DENOTED VB ON PLAN)



TYPICAL WALL BRACING DETAIL - ROD AND TURNBUCKLE

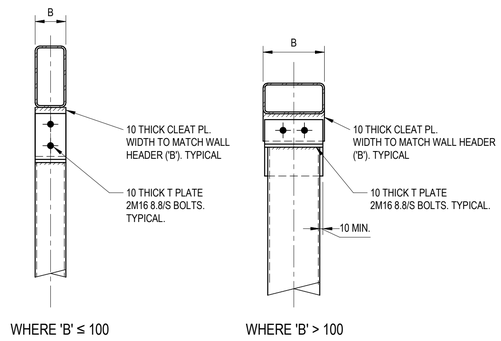
SCALE 1:10
(DENOTED VB ON PLAN)



BEAM SIZE	END PL	NUMBER OF MECH ANCHORS
200 UB	12	4
250 UB	16	4
310 UB	16	4
360 UB	16	4
410 UB	16	6
460/530 UB	16	6

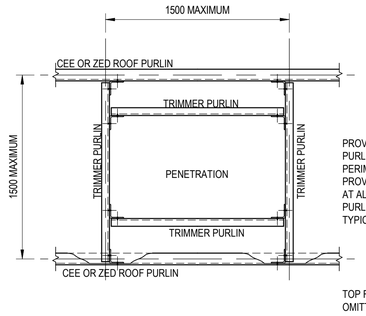
TYPICAL CONNECTION AT CONCRETE STRUCTURE

SCALE 1:10

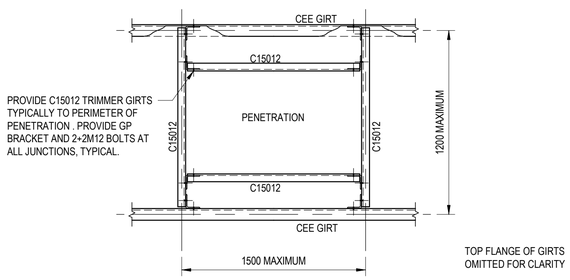


TYPICAL COLUMN TO WALL / WINDOW HEAD CONNECTION

SCALE 1:10



TYPICAL ROOF PENETRATION TRIMMER DETAIL



TYPICAL GIRT PENETRATION TRIMMER DETAIL

THESE DRAWINGS REPRESENT 100% DETAILED DESIGN OPTION ONLY

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Issue

No.	Date	Description	Chkd
1	13.02.2023	SCHEMATIC DESIGN	ZP
2	15.06.2023	50% DESIGN DEVELOPMENT	TB
3	15.09.2023	80% DESIGN DEVELOPMENT	TB
4	22.09.2023	100% DESIGN DEVELOPMENT DRAFT ISSUE	TB

Arcitect
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Nominated Architect:
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NBRS & Partners Pty Ltd VIC 51197 ABN 16 002 247 565

Client
NSW GOVERNMENT Health Infrastructure

Project
CONCORD REPATRIATION GENERAL HOSPITAL
at
109 HOSPITAL ROAD, NSW 2139

for
NSW GOVERNMENT HEALTH & INFRUSTRUCTURE

Drawing Title
TYPICAL STEEL DETAILS - SHEET 2

Date 25/09/2023 6:28:50 AM
Scale As indicated @ A1

Drawing Reference
22071-S-14.01
Revision 4

Appendix D - EI Australia – Report Ref No E25996.G03

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LIPMAN PTY LTD

Geotechnical Investigation

1H Hospital Road, Concord West NSW

E25996.G03
10 August 2023

Document Control

Report Title: Geotechnical Investigation, 1H Hospital Road, Concord West NSW

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Author	Technical Reviewer
	
Jack (Haojie) Chen **Geotechnical Engineer**	**Mike Leung** **Principal Geotechnical Engineer**

Revision	Details	Date	Amended By
	Original	10 August 2023	

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1. Introduction

1.1 Background

At the request of Mr Jacob Nielson on behalf of Lipman Pty Ltd (the Client), EI Australia (EI) has carried out a Geotechnical Investigation (GI) for the proposed development at 1H Hospital Road, Concord West NSW (the Site).

This GI report has been prepared to provide advice and recommendations to assist in the preparation of designs for the proposed development. The investigation has been carried out in accordance with the agreed scope of works outlined in EI's proposal referenced P21305.1, dated 24 March 2023, and with the Client's signed authorisation to proceed, dated 2 June 2023.

1.2 Proposed Development

The following documents, supplied by the Client, were used to assist with the preparation of this GI report:

- Approximate Borehole Location Plan prepared by ACOR Consultants Pty Ltd;
- Ground Floor Overall Plan, drawing ref.: 221192-S-07.00 Revision 1, prepared by NBRS & Partners Pty Ltd;
- Site Layout Plan, drawing ref.: 22071-A-0200 Revision 4, prepared by NBRS & Partners Pty Ltd;
- Investigation brief provided by the client.

Based on the provided documents, EI understand the following to be the proposed development:

- The development area hereafter referred to as the 'Site' is irregular in shape, currently occupied by an existing building in part, with the remaining areas comprising car park, driveways and lawns;
- The existing building will be demolished to make wat for a new building; and
- The development is proposed to comprise a three-storey building with no basement.

1.3 Objectives

The objective of the GI was to assess site surface and subsurface conditions at seven (7) borehole locations, and to provide geotechnical advice and recommendations addressing the following:

- Building foundation options, including;
  - Appropriate foundation materials for the proposed structural footings;
  - Geotechnical parameters;
  - Foundation types, serviceability bearing pressures and settlements;
  - Earthquake loading factor in accordance with AS1170.4:2007.
- Earthworks and subgrade preparation recommendations;
- The requirement for additional geotechnical works.

1.4 Scope of Works

The scope of works for the GI included:

- Preparation of a Work Health and Safety Plan;
- Review of relevant geological maps for the project area;
- Site walkover inspection by a Geotechnical Engineer to assess topographical features and site conditions;
- Scanning of proposed borehole locations for buried conductive services using a licensed service locator with reference to Dial Before You Dig (DBYD) plans;
- Auger drilling of seven boreholes (BH1M, BH2, BH3M, BH4, BH5, BH6M and BH7) by a track-mounted drill rig using solid flight augers equipped with a 'Tungsten-Carbide' (T-C) bit. The boreholes were auger drilled to depths as shown in **Table 1-1** below:

Table 1-1 Auger Drilling and Rock Coring Depths

Borehole ID	Augering	Rock Coring
	Termination Depth (m)	Termination Depth (m)
BH1M	3.00	7.60
BH2	3.00	7.24
BH3M	2.52	6.0
BH4	2.70	6.0
BH5	3.45	6.0
BH6M	2.30	7.2
BH7	3.0	6.0

- Standard Penetration Testing (SPT) was carried out (as per AS 1289.6.3.1-2004), where possible, during auger drilling of the boreholes to assess soil strength/relative densities.
- Measurements of groundwater seepage/levels, where possible, in the augered sections of the boreholes during and shortly after completion of auger drilling;
- The strength of the bedrock in the augered sections of the boreholes was assessed by observation of the auger penetration resistance using a T-C drill bit and examination of the recovered rock cuttings. It should be noted that rock strengths assessed from augered boreholes are approximate and strength variances can be expected.
- Continuation of all boreholes using NMLC diamond rock coring techniques to termination depths shown above in **Table 1-1**. The rock core photographs are presented in **Appendix A**;
- Borehole BH1M, BH3M and BH6M were converted into groundwater monitoring wells with screen depths of between 3m to 6m in all three wells to allow for future groundwater monitoring.

- Borehole BH2, BH4, BH5, and BH7 were backfilled with drilling spoils and capped with concrete upon completion;
- Soil and rock core samples were sent to STS Geotechnics Pty Ltd (STS) and SGS Australia (SGS), which are National Australian Testing Authority (NATA) accredited laboratories, for testing and storage.
- Preparation of this GI report.

EI's Geotechnical Engineer was present full-time onsite to set out the borehole locations, direct the testing and sampling, log the subsurface conditions and record groundwater levels.

1.5 Constraints

The GI was limited by the intent of the investigation and the presence of existing site structures. The discussions and advice presented in this report are intended to assist in the preparation of initial designs for the proposed development. Further geotechnical inspections should be carried out during construction to confirm the geotechnical and groundwater models, and the design parameters provided in this report.

The presence of underground services and the need to maintain vehicle thoroughfare within the investigation area precluded positioning of boreholes at locations stipulated in the Client's investigation brief. EI have relocated boreholes (where required) to as close as possible to the intended locations.

2. Site Description

2.1 Site Description and Identification

The site identification details and associated information are presented in **Table 2-1** below while the site locality is shown on **Figure 1.** An aerial photograph of the site is presented in **Plate 1** below.

Table 2-1 Summary of Site Information

Information	Detail
Street Address	1H Hospital Road, Concord West NSW
Lot and Deposited Plan (DP) Identification	Lot 2 in DP 1280788
Brief Site Description	The site was occupied by an existing single-storey building in the southern portion of the site. The remaining areas are open space comprising lawns and asphalt surfaced car park and access roadways.
Site Area	The site area is approximately 2,706m^2

Plate 1: Aerial photograph of the site (source: SIXMaps, accessed 30/5/23)

2.2 Local Land Use

The site is situated within an area of commercial (hospital) use. Current uses on surrounding land at the time of our presence on site are described in **Table 2-2** below. For the sake of this report, the site boundary adjacent to Hospital Road shall be adopted as the northern site boundary.

Table 2-2 Summary of Local Land Use

Direction Relative to Site	Land Use Description
North	Hospital Road, a two lane, asphalt-paved road.
East	Manning Concord Hospital unit 110, a double storey brick rendered facility.
South	Jara Ward unit 112, a single storey brick building with grassy areas.
West	Concord medical education centre unit 26, a single brick rendered building.

2.3 Regional Setting

The site topography and geological information for the locality is summarised in **Table 2-3** below**.**

Table 2-3 Topographic and Geological Information

Attribute	Description
Topography	The site is located at the central portion of the Concord Hospital within gently (0° to 5°), south-west dipping topography.
Regional Geology	Information on regional sub-surface conditions, referenced from the Department of Mineral Resources Geological Map Sydney 1:100,000 Geological Series Sheet 9130 (DMR 1983) indicates the site to be underlain by Quaternary Aged Holocene deposits (Qha) associated with stream alluvial and estuarine sediments, which consists of silty to peaty quartz sand, silt, and clay, Ferruginous and humic cementation in places, and common shell layers. It is expected that the soils are underlain by Hawkesbury Sandstone. Previous geotechnical site investigations by Coffey Services Australia were carried out as part of the Phase 2 redevelopment of the hospital precinct in 2016 to 2017. The Phase 2 redevelopment footprint investigated by Coffey was located west and south-west of the subject site. The borehole encountered Ashfield Shale (Rwa) and Hawkesbury Sandstone (Rh) beneath the overburden soils. Depending on location, a residual soil profile was encountered beneath the Quaternary alluvium. Shale bedrock was encountered at depths ranging from 1.2m to 2m below ground surface levels underlain by Sandstone at depths of about 8m to 10m.

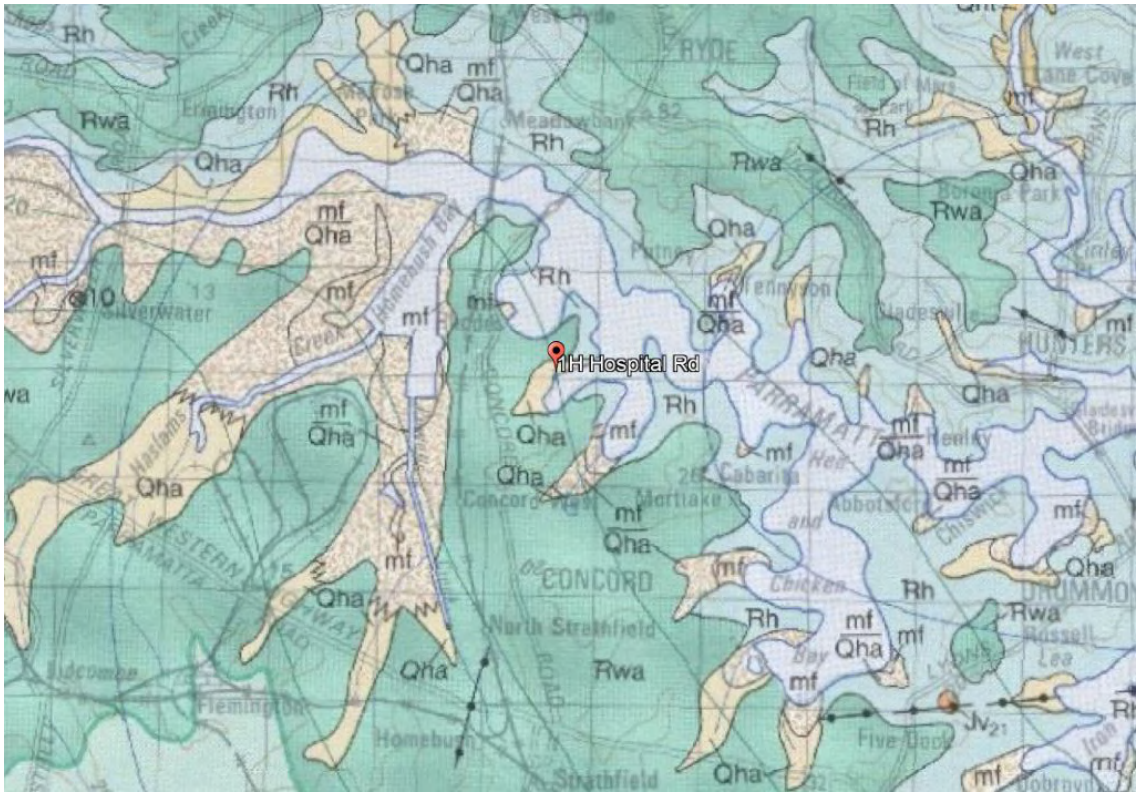


Plate 2: Excerpt of geological map showing location of site.

3. Investigation Results

3.1 Stratigraphy

For the development of a site-specific geotechnical model, the stratigraphy observed in the GI has been grouped into four geotechnical units. A summary of the subsurface conditions across the site, interpreted from the assessment results, is presented in **Table 3-1** below. More detailed descriptions of subsurface conditions at each borehole location are available on the borehole logs presented in **Appendix A**. The details of the methods of soil and rock classifications, explanatory notes and abbreviations adopted on the borehole logs are also presented in **Appendix A.**

Table 3-1 Summary of Subsurface Conditions

Unit	Material[2]	Depth to Top of Unit (m BEGL)[1]	Observed Thickness (m)	Comments
1	**Topsoil/Fill**	Surface to 0.15	0.3 to 1.6	Asphalt pavements of 100mm to 150mm thickness, underlain by well compacted Fill material comprising fine to medium grained silty sand with traces of sub-angular to sub-rounded gravels, and appeared well compacted based on our observations during drilling and SPT N value of 11 in BH6M.
2	**Residual Soil / Extremely Weathered Sandstone (Class V)**	0.3 to 1.6	1.0 to 3.6	Low to medium plasticity, stiff to hard clay, overlying extremely weathered sandstone (assess Class V Sandstone). SPT N values range from 14 to practical refusal (hammer bounding) in the overburden soils profile. The hammer bounced occurred in extremely weathered sandstone. From depths between 3.0m to 4.15m and 3.0 to 3.2m, core loss of 1150mm and 200mm was observed in BH1M and BH7 respectively. Core loss is inferred to be extremely weathered sandstone.
3a	**Class IV Sandstone**	2.52 to 4.3	0.3 to 3.11	Distinctly weathered, very low to medium strength sandstone. A layer of very low to medium strength shale was observed in BH2 from depths between 3m to 5.5m. Core losses observed in BH2, BH4M, and BH6M are inferred to be bands of decomposed or highly fractured material.
3b	**Class III Sandstone**	3.85 to 6.11	-[3]	Slightly weathered medium to high strength sandstone.

Note 1 Approximate depth and level at the time of our assessment. Depths and levels may vary across the site.
Note 2 For more detailed descriptions of the subsurface conditions, reference should be made to the borehole logs attached to **Appendix A.**
Note 3 Observed up to termination depth in all boreholes.

Table 3-2 Depth to Overburden Units and Rock Classes

Unit	Depth to top of material unit (m BEGL)						
	BH1M	BH2	BH3M	BH4	BH5	BH6M	BH7
1 – Topsoil/Fill	0.10	0.10	0.00	0.00	0.15	0.00	0.10
2 – Residual Soil/ Extremely Weathered Sandstone (Class V)	0.60	0.60	0.30	0.70	0.60	1.60	0.80
3a – Class IV Sandstone	4.15	3.00	2.52	4.30	3.55	-	4.20
3b – Class III Sandstone	6.00	6.11	4.35	5.15	3.85	4.20	4.10

3.2 Groundwater Observations

Following completion of auger drilling, groundwater monitoring wells were installed in BH1M, BH3M, and BH6M and bailed dry. The groundwater levels were then measured within the monitoring wells as per **Table 3-3** below:

Table 3-3 Groundwater Levels

Borehole ID	Groundwater Seepage Level During Auger Drilling	Monitoring Well Details		Groundwater Level After Well Development	Measurement Date
	m BEGL	Screened Zone (mBEGL)	Screen Length (m)	m BEGL	
BH1M	Not encountered	3 - 6	3.0	2.27	25-July-2023
BH3M	Not encountered	3 - 6	3.0	2.44	25-July-2023
BH6M	Not encountered	3 - 6	3.0	2.58	25-July-2023

No groundwater or significant seepage was observed during or after auger drilling of the boreholes. We note that the groundwater levels may not have become evident or stabilised in the augered boreholes within the limited observation period. Water circulation as is required for rock coring within the boreholes prevented further observations of groundwater levels within the cored section of the boreholes. No long term groundwater monitoring was carried out.

3.3 Test Results

Ten grab size soil samples and one bulk size sample were selected for laboratory testing to assess the following:

- Atterberg Limits;
- Soil Moisture Content;
- Particle Size Distribution;
- Soil aggressivity (pH, chloride and sulfate content and electrical conductivity); and
- California Bearing Ratio (CBR).

A summary of the soil test results is provided in **Table 3-4** and **Table 3-5** below. Laboratory test certificates are presented in **Appendix B**.

Table 3-4 Summary of Soil Laboratory Test Results

Test/ Sample ID		BH1M 1.5-1.65	BH7 1.5-1.8	BH5 3.0-3.45	BH4 1.5-1.85	BH5 1.5-1.68	BH3M 1.5-1.95	BH2 1.5-1.72	BH6M 1.5-1.95
Unit		2	2	2	2	2	2	2	2
Material Description [1]		Residual Soil/ Extremely Weathered Sandstone							
Aggressivity	Chloride Cl (ppm)	290	70	520	-	-	-	-	-
	Sulfate SO_4 (ppm)	160	91	170	-	-	-	-	-
	pH	5.1	5.5	4.3	-	-	-	-	-
	Electrical Conductivity (µS/cm)	240	110	480	-	-	-	-	-
	Moisture Content (%)	10.8	12.1	-	13.0	11.8	17.0	17.0	22.6
Atterberg Limits	Liquid Limit (%)	37	36	-	39	40	-	-	-
	Plastic Limit (%)	20	21	-	21	21	-	-	-
	Plasticity Index (%)	17	15	-	18	19	-	-	-
Particle Size Distribution	Gravel (%)	-	-	-	-	-	6.0	13.5	7.1
	Sand (%)	-	-	-	-	-	6.1	23.7	9.7
	Clay & Silt (%)	-	-	-	-	-	87.9	62.8	83.2

Note 1 More detailed descriptions of the subsurface conditions at each borehole location are available on the borehole logs presented in **Appendix A**.

The Atterberg Limits result on the selected clay samples indicated clays to be of medium plasticity and therefore expected to exhibit moderate shrink-swell potential.

The assessment indicated low permeability soil was present both above and below the groundwater table. In accordance with Tables 6.4.2(C) and 6.5.2(C) of AS 2159:2009 'Piling – Design and Installation', the results of the pH, chloride and sulfate content and electrical conductivity of the soil provided the following exposure classifications:

- 'Moderate' for buried concrete structural elements; and
- 'Non-Aggressive' for buried steel structural elements.

Table 3-5 Summary of CBR Test Results

Test/ Sample ID	BH6_CBR
Depth (m BEGL)	1.5-1.6
Unit	1
Material Description [1]	FILL: Sandy Clay, low to medium plasticity
CBR (4-day Soaked) (%)	8.0
Maximum Dry Density (t/m^3)	1.784
Optimum Moisture Content OMC (%)	16.4
Field Moisture Content FMC (%)	14.8
Moisture deviation from OMC	1.6% Dry

Note 1 More detailed descriptions of the subsurface conditions at each borehole location are available on the borehole logs presented in **Appendix A**.

Bulk samples of the Unit 1 silty clay fill material from BH6 was tested for standard compaction and four day soaked CBR with 9kg surcharge, yielding a CBR value of 8%.

Twenty-eight selected rock core samples were tested by STS Geotechnics Pty Ltd to estimate the Point Load Strength Index (Is_{50}) values to assist with rock strength assessment. The results of the testing are summarised on the laboratory test report and replicated in the borehole logs.

4. Recommendations

4.1 Geotechnical Considerations

Based on the results of the assessment, we consider the following to be the main geotechnical considerations for the proposed development:

- Foundation design for building loads;
- Earthworks and subgrade preparation;
- Design subgrade CBR value to inform pavement thickness design.

4.2 Site Preparation

At the time of preparing this report, the design subgrade levels for the building and subgrade levels for pavements are not known. It is assumed that the proposed building and pavements will be constructed at grade with minimal cut/fill operations.

Based on subsurface conditions encountered in all boreholes, the materials expected to be encountered within the depth of excavation / stripping for site preparation may include topsoil and fill comprising silty sand and clayey sand. Fill materials comprising sandy clay was encountered to a depth of 1.6m BEGL at the location of BH6M, although it may not be encountered during site preparation works considering that BH6M is located outside the proposed building footprint. Excavation of topsoil and fill may be readily achieved using excavators fitted with excavation buckets and if needed fitted with tiger teeth.

Following removal of all vegetation and trees (including their root balls), demolition of the existing structures, slabs and pavements, all grass, topsoil, root affected soils and any deleterious fill (if present) or contaminated soil should be stripped. Based on the results of the investigation, topsoil/root affected soil should be stripped to a nominal depth. We note that it is difficult to accurately assess the depth of topsoil and root affected soils. If considered to be an important contractual issue, we recommend that a number of shallow test pits be excavated across the site to more accurately confirm the topsoil/root affected soil stripping depth or alternatively a geotechnical inspection could be carried out after initial stripping to confirm the depth. Stripped topsoil and root affected soils should be stockpiled separately as they are considered unsuitable for reuse as engineered fill.

4.3 Foundations

At the time of preparing this report, the design building loads are not known.

The most competent foundation stratum at the site is the underlying sandstone bedrock, and in view of the relatively shallow bedrock depths and shallow groundwater levels, we recommend that the proposed building be supported on pile footings founded into the underlying sandstone bedrock. However, the option of piled stiffened raft slab footings is also provided.

We note that only one groundwater measurement visit was carried out post site investigation in the three installed groundwater monitoring wells on 25 July 2023. We recommend that additional groundwater studies may be required, including pump out testing and groundwater level measurement to understand the groundwater regime to inform recommendations on groundwater control during pile hole drilling.

4.3.1 Pile Footings

The proposed building may be supported on deep foundations, such as piles, founded into sandstone bedrock.

The recommended bearing pressures and shaft adhesion for foundation bored piles are presented in **Table 4-1**.

Table 4-1 Summary of foundation parameters for bored piles

Rock Class	Serviceability End Bearing Pressure (kPa)[3]	Ultimate Shaft Adhesion - Compression (kPa)[2]
Class V Sandstone	700	100
Class IV Sandstone	2000	500
Class III Sandstone	4000	1000

Notes:

1 More detailed descriptions of subsurface conditions are available on the borehole logs presented in **Appendix A.**

2 Side adhesion values given assume there is intimate contact between the pile and foundation material and should achieve a clean socket roughness category R2 or better. Design engineer to check both 'piston pull-out' and 'cone liftout' mechanics in accordance with AS4678-2002 Earth Retaining Structures.

3 To adopt these parameters we have assumed that:

- Footings have a nominal socket of at least 0.3m, into the relevant founding material;
- For piles, there is intimate contact between the pile and foundation material (a clean socket roughness category of R2 or better);
- Potential soil and groundwater aggressivity will be considered in the design of piles and footings;
- Piles should be drilled in the presence of a Geotechnical Engineer prior to pile construction to verify that ground conditions meet design assumptions. Where groundwater ingress is encountered during pile excavation, concrete is to be placed as soon as possible upon completion of pile excavation. Pile excavations should be pumped dry of water prior to pouring concrete, or alternatively a tremmie system could be used;
- The bases of all pile, pad and strip footing excavations are cleaned of loose and softened material and water is pumped out prior to placement of concrete;
- The concrete is poured on the same day as drilling, inspection and cleaning.
- The allowable bearing pressures given above are based on serviceability criteria of settlements at the footing base/pile toe of less than or equal to 1% of the minimum footing dimension (or pile diameter).

The shaft adhesion for uplift in sandstone bedrock may adopt 50% of that in compression for the socket length in excess of 0.5m into the material.

It must be noted that all footings should be founded on similar materials and rock class to minimise the impact of differential settlement.

At least the initial drilling of piles should be completed in the presence of a geotechnical engineer to verify that ground conditions meet design assumptions.

Where groundwater ingress is encountered during pile excavation, concrete is to be placed as soon as possible upon completion of pile excavation. Pile excavations should be pumped dry of water and sludge and cleaned using a cleaning bucket prior to pouring concrete. The use of a tremmie pipe to place concrete from the base of the open pile hole is recommended. Concrete must be poured on the same day as drilling, inspection and drilling.

The aggressivity of natural soils and groundwater (if encountered) should be taken into consideration in the design.

4.3.2 Piled Stiffened Raft Slab

Raft slabs are well suited to uniform slab conditions and building loads. Further detailed evaluation of expected performance including the evaluation of allowable bearing pressures and settlements would be required once design loads, founding level, and column layout are better known.

In the case of a piled stiffened raft slab, the piles are designed to their ultimate capacity and act as settlement reducers to the stiffened raft slab.

The subgrade preparation below any raft slabs will be important in the final performance of the raft. Detailed analysis of a piled raft would be required to estimate the settlements and the contact pressures below the raft. Further discussion regarding sub-grade preparation is provided in **Section 4.4** below. It is also recommended that a 150mm thick layer of good quality granular material such as recycled concrete or crushed rock be placed and compacted over the prepared surface, particularly at heavily loaded areas. This layer helps confine the sandy soils from disturbances and improve the compacted and density of the surface soils.

4.4 Subgrade Preparation and Engineered Fill

4.4.1 Subgrade Preparation for slabs and pavements

Earthworks recommendations provided in this report should be complemented by reference to AS3798-2007.

- Considering that the depth of existing fill materials are relatively shallow (within 0.6m of the existing ground surface) across the proposed building footprint, and the history and compaction control of that existing fill is not known, it is therefore recommended that the fill should be fully excavated down to surface of the residual soils, and stockpiled separately for further suitability assessment for potential re-use as engineered fill. Such excavation may need to be carried out with the excavation sides battered at an angle of no steeper than 1 Vertical to 3 Horizontal. The new fill must be 'keyed-in' the sides of these batters.
- The exposed subgrade at the base of the excavation should be proof rolled with a smooth drum roller (say 12 tonne) used in static or non-vibratory mode of operation. Caution is required when proof rolling near existing infrastructures and utilities (where present). The purpose of the proof rolling is to detect any soft or heaving areas, and to allow for some further improvement in strength or compaction.
- The final pass should be undertaken in the presence of an experienced geotechnician or geotechnical engineer, to detect any unstable or soft subgrade areas, and to allow for some further improvement in strength/compaction.
- If dry conditions prevail at the time of construction then any exposed alluvial clay subgrade may become desiccated or have shrinkage cracks prior to pouring any concrete slabs. If this occurs, the subgrade must be watered and rolled until the cracks disappear.
- Unstable subgrade detected during proof rolling should be locally excavated down to a sound base and replaced with engineered fill or further advice should be sought. Any fill placed to raise site levels should also be engineered fill, as per the specifications below.
- Where a raft slab is adopted, the geotechnical engineer would also need to carry out a series of Dynamic Cone Penetrometer (DCP) tests to assess the consistency of the subgrade materials. We expect that a capping layer of well graded crushed rock or recycled concrete (maximum particle size limited to 40mm) will be required to achieve adequate compaction. This granular layer will be required below the entire raft slab and would be of about 150mm thick.
- The performance of raft (including piled raft) slabs are also dependent on the whole of the design and construction team being familiar with the sensitivity of the situation. It is essential that any services which have to be placed in the subgrade are carefully positioned and an appropriate construction schedule/sequence is provided to the geotechnical engineer for approval at the planning stage.
- Disturbance of the subgrade must be minimised and kept outside the zone of influence of column or wall loads. A documented Inspection and Test Plan (ITP) should be prepared prior to construction with appropriate "hold" points in the Quality System.

4.4.2 Engineered Fill Specifications

Any fill used to backfill unstable subgrade areas, raise surface levels or backfill service trenches should be engineered fill. Materials preferred for use as engineered fill are well-graded granular materials, such as ripped or crushed sandstone, free of deleterious substances and having a maximum particle size not exceeding 75 mm. such fill should be compacted in layers not greater than 200 mm loose thickness, to a minimum density of 98% of SMDD for cohesive soils, or minimum density index of 75% for cohesionless soils.

Density tests should be regularly carried out on the fill to confirm the above specifications are achieved. The frequency of density testing should be at least one test per layer per material type per 1000 m^2 or 1 test per 200m^3 distributed reasonably evenly throughout full depth and area or 1 test per lot per layer, whichever requires the most tests, commensurate to Type 2 earthworks per Table 8.1 of AS3798-2007. We recommend that at least Level 2 control of fill compaction, as defined in AS3798-2007, be adhered to on this Site. Preferably, the geotechnical testing authority (GTA) should be engaged directly on behalf of the client and not by the earthworks subcontractor.

We recommend that the engineered fill layers extend a horizontal distance of at least 1m beyond the design geometry. The roller must extend over the edge of each placed layer in order to seal the batter surface. On completion of filling, the excess under-compacted edge fill should be trimmed back to the design geometry.

The ‘tying in’ of engineered fill to temporary cut batter slopes can be achieved by locally benching the cut slopes in no greater than 0.4m high steps. This can be carried out progressively as the height of engineered fill increases.

For backfilling confined excavations such as service trenches, a similar compaction to engineered fill should be adhered to, but if light compaction equipment is used then the layer thickness should be limited to 100mm loose thickness.

During construction of the fill, platform runoff should be enhanced by providing suitable falls to reduce ponding of water on the surface of the fill. Ponding of water may lead to softening of the fill and subsequent delays in the earthworks program. A poorly drained subgrade may become un-trafficable when wet. We recommend that if soil softening occurs, the subgrade be over-excavated to below the affected soil, and then replaced with engineered fill as specified above.

4.5 Pavement Subgrade

The design of new pavements will depend on subgrade preparation, subgrade drainage, the nature and composition of fill excavated or imported to the site, as well as vehicle loadings and use. Various alternative types of construction could be used for the pavements. Concrete construction would undoubtedly be the best in areas where heavy vehicles manoeuvre such as trucks turning and manoeuvring. Flexible pavements may have a lower initial cost, but maintenance will be higher. These factors should be considered when making the final choice.

Based on the laboratory test results, the samples collected of the existing sandy clay from BH6M returned a CBR value 8%. Additional CBR testing of subgrade materials will be required where the subgrade materials and conditions differ to that tested across proposed pavement areas.

Further soaked CBR tests may be carried out on representative samples of the subgrade to obtain a large population of values to enable a proper statistical analysis to be performed and possibly an increase in the design CBR value. However, it should be borne in mind that even with more test values being obtained there will still be isolated pavement areas where the risk of potential failure and higher maintenance will occur due to the subgrade having a lower CBR value than the statistical characteristic value opted for design purposes.

We recommend that in situ density tests be completed on the proof rolled and prepared subgrade to confirm that at least 98% Standard Maximum Dry Density (SMDD) has been achieved. If the existing fill is removed and replaced with imported fill, the CBR of the imported material may be taken into account. These design values should be confirmed by inspection and Dynamic Cone Penetration (DCP) testing of the subgrade following proof rolling.

All upper (base) course should be crushed rock to RMS QA specification 3051 (2013) unbound base and compacted to at least 100% of SMDD. All lower (sub-base) course should be crushed rock to RMS QA specification 3051 (2013) unbound base or ripped/crushed sandstone with CBR greater than 40%, maximum particle size of 60mm, well graded and Plastic Index less than 10. All lower course material should be compacted to an average of no less than 100% of SMDD, but with a minimum acceptance value of 98% of SMDD.

Concrete pavements should have a sub-base layer of at least 100mm thickness of crushed rock to RMS QA specification 3051 (2013) unbound base material (or equivalent good quality and durable fine crushed rock) which is compacted to at least 100% SMDD. Concrete pavements should be designed with an effective shear transmission of all joints by way of either doweled or keyed joints.

Careful attention to subsurface and surface drainage is required in view of the effect of moisture on the clay soils. Pavement levels will need to be graded to promote rapid removal of surface water so ponding does not occur on the surface of pavements. The drainage trenches should be excavated with a uniform longitudinal fall to appropriate discharge points so as to reduce the risk of water ponding. The capacity of the stormwater collection system from the pavement should be checked and upgraded if necessary. In order to protect the pavement edge, subsoil drains should be provided along the perimeter of all proposed new external pavement areas, particularly in those areas of cut, with invert levels of at least 200mm below subgrade level.

The long-term successful performance of the pavements is dependent on the satisfactory completion of the earthworks. In order to achieve this, the quality assurance programme should not be limited to routine compaction density testing only. Other important factors associated with the earthworks includes subgrade preparation, selection of fill materials, control of moisture content and drainage, etc.

5. Further Geotechnical Inputs

Below is a summary of the recommended additional work that may need to be carried out:

- Additional CBR tests to inform pavement thickness design, if required;
- Classification of all excavated material transported off site; and
- Geotechnical inspections of all new footings/piles by an experienced geotechnical professional before concrete or steel are placed to verify their bearing capacity and the in-situ nature of the founding strata.

We recommend that a meeting be held after initial structural design has been completed to confirm that our recommendations have been correctly interpreted. We also recommend a meeting at the commencement of construction to discuss the primary geotechnical issues and inspection requirements.

6. Statement of Limitations

This report has been prepared for the exclusive use of Craig Butler and Lipman Pty Ltd who is the only intended beneficiary of EI's work. The scope of the assessment carried out for the purpose of this report is limited to those agreed with Craig Butler and Lipman Pty Ltd

No other party should rely on the document without the prior written consent of EI, and EI undertakes no duty, or accepts any responsibility or liability, to any third party who purports to rely upon this document without EI's approval.

EI has used a degree of care and skill ordinarily exercised in similar investigations by reputable members of the geotechnical industry in Australia as at the date of this document. No other warranty, expressed or implied, is made or intended. Each section of this report must be read in conjunction with the whole of this report, including its appendices and attachments.

The conclusions presented in this report are based on a limited investigation of conditions, with specific sampling and test locations chosen to be as representative as possible under the given circumstances.

EI's professional opinions are reasonable and based on its professional judgment, experience, training and results from analytical data. EI may also have relied upon information provided by the Client and other third parties to prepare this document, some of which may not have been verified by EI.

EI's professional opinions contained in this document are subject to modification if additional information is obtained through further investigation, observations, or validation testing and analysis during construction. In some cases, further testing and analysis may be required, which may result in a further report with different conclusions.

We draw your attention to the document "Important Information", which is included in **Appendix D** of this report. The statements presented in this document are intended to advise you of what your realistic expectations of this report should be. The document is not intended to reduce the level of responsibility accepted by EI, but rather to ensure that all parties who may rely on this report are aware of the responsibilities each assumes in so doing.

Should you have any queries regarding this report, please do not hesitate to contact EI.

References

AS1289.6.3.1:2004, *Methods of Testing Soils for Engineering Purposes,* Standards Australia.

AS1726:2017, *Geotechnical Site Investigations*, Standards Australia.

AS2159:2009, *Piling – Design and Installation*, Standards Australia.

AS3600:2009, *Concrete Structures,* Standards Australia

AS3798-2007, Guidelines on Earthworks for Commercial and Residential Developments

Safe Work Australia Excavation Work Code of Practice, dated January 2020 – WorkCover NSW

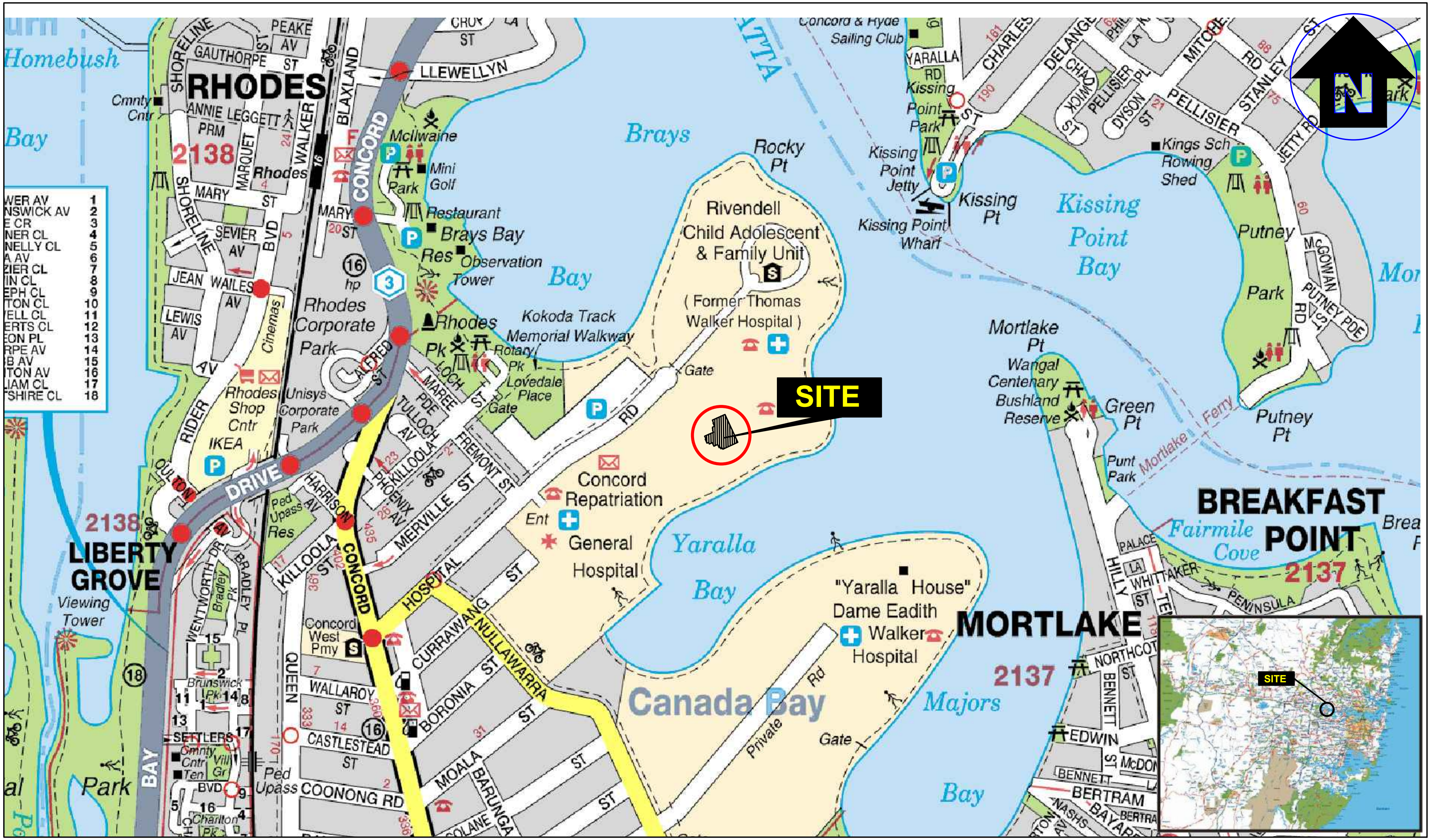
NSW Department of Finance and Service, Spatial Information Viewer, maps.six.nsw.gov.au.

NSW Department of Mineral Resources (1983) Sydney 1:100,000 Geological Series Sheet 9130 (Edition 1). Geological Survey of New South Wales, Department of Mineral Resources.

Abbreviations

AHD	Australian Height Datum
AS	Australian Standard
BEL	Bulk Excavation Level
BEGL	Below Existing Ground Level
BH	Borehole
DBYD	Dial Before You Dig
DP	Deposited Plan
EI	EI Australia
GI	Geotechnical Investigation
NATA	National Association of Testing Authorities, Australia
RL	Reduced Level
SPT	Standard Penetration Test
T-C	Tungsten-Carbide
UCS	Unconfined Compressive Strength

Figures



Drawn:	J.O.	**Lipman Pty Ltd** Geotechnical Investigation 1H Hospital Road, Concord, NSW Site Locality Plan	Figure: 1
Approved:	M.L.		
Date:	8-8-2023		
Scale:	Not To Scale		Project: E25996.G03

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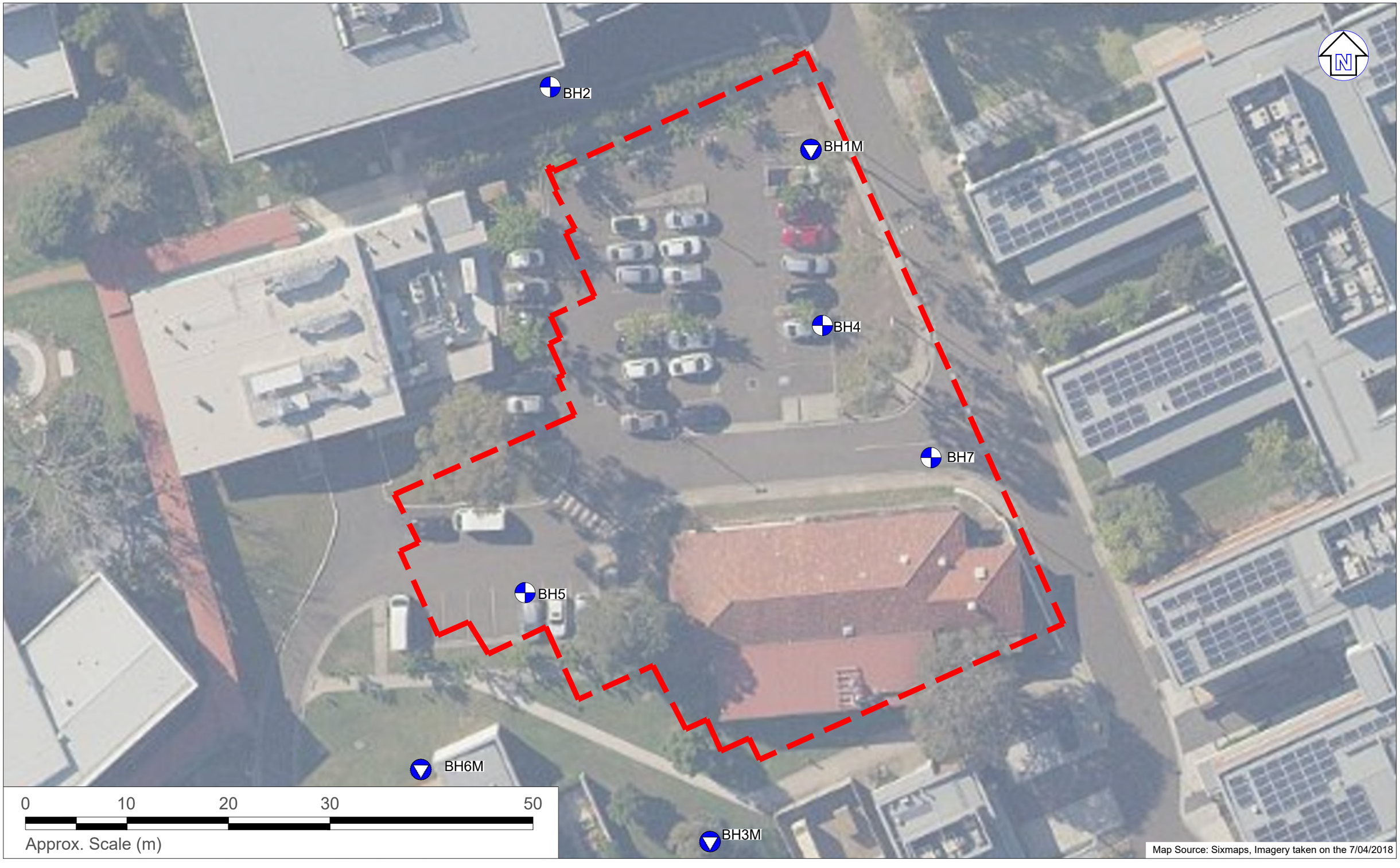

LEGEND (Note: All locations are approximate)

- Site boundary
- Borehole locations
- Monitoring Well locations

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Drawn:	J.O.
Approved:	M.L.
Date:	8-8-2023

Lipman Pty Ltd
Geotechnical Investigation
1H Hospital Road, Concord, NSW
Borehole Location Plan

Figure: 2

Project: E25996.G03

Appendix A – Borehole Logs And Explanatory Notes

BOREHOLE LOG

BH ID: BH1M

Location	1H Hospital Road, Concord West, NSW		**Started**	24 May 2023	
Client	Lipman Pty Ltd		**Completed**	24 May 2023	
Job No.	E25996.G03		**Logged By**	JO	**Date** 24 May 2023
Sheets	1 of 2		**Review By**	ML	**Date** 08 August 2023
Drilling Contractor	Geosense Drilling Engineers	**Surface RL** -	**Northing**	6254460.6730 (MGA 2020 Zone 56)	
Plant	Comacchio Geo 205	**Inclination** 90°	**Easting**	323863.8164 (MGA 2020 Zone 56)	

METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	SAMPLE RECOVERY	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / REL. DENSITY	MATERIAL ORIGIN & OBSERVATIONS
AD/T	7/25/2023 7:10:00 AM			0			ASPHALT: 100mm thick	-	-	ASPHALT
				0.00			FILL: Silty SAND: fine to medium grained, dark brown with sub-angular to sub-rounded gravels, appears well compacted.	D	-	FILL
		BH1M_0.50-0.95 SPT 0.50-0.95 8,15,30 N=45		0.10						
				0.60			Silty CLAY: low to medium plasticity, pale grey-orange	M < PL	H	RESIDUAL SOIL
		BH1M_1.50-1.65 SPT 1.50-1.65 18/150 mm HB N=R		1						
				1.65			SANDSTONE: fine to medium grained, pale grey-orange, extremely weathered.	-	-	WEATHERED ROCK
				2						
				3			*Log continued on next page.*			
				3.00						
				4						
				5						
				6						
				7						
				8						
				9						
				10						

BOREHOLE LOG

BH ID: BH1M

Location	1H Hospital Road, Concord West, NSW			**Started**	24 May 2023
Client	Lipman Pty Ltd			**Completed**	24 May 2023
Job No.	E25996.G03			**Logged By**	JO **Date** 24 May 2023
Sheets	2 of 2			**Review By**	ML **Date** 08 August 2023
Drilling Contractor	Geosense Drilling Engineers	**Surface RL**	-	**Northing**	6254460.6730 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	323863.8164 (MGA 2020 Zone 56)

METHOD	Flush Return	TCR %	RQD %	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	WEATHERING	ESTIMATED STRENGTH Is(50) ▼ - Axial ▽ - Diametral (VL 0-1, L 0-3, M 1, H 3, VH 10, EH)	DISCONTINUITIES & ADDITIONAL DATA	FRACTURE SPACING (30, 100, 300, 1000, 3000)
				0			*Log continued from previous page.*				
				1							
				2							
				3			NO CORE: 1150mm thick	-			
	0% Water	0	0	4							
NMLC				4.15			SANDSTONE: fine to medium grained, pale grey-orange, thinly to medium bedded	DW	▼		
		100	57	5				SW	▼		
	90% Water			6					▼	5.91: JT 45° PR SM CN	
		100	92	7				FR	▼	7.43: JT 1° PR SM CN	
				8			Terminated at 7.60m. Target Depth Reached.				
				9							
				10							

BOREHOLE LOG

BH ID: BH1M

Location	1H Hospital Road, Concord West, NSW			**Started**	24 May 2023
Client	Lipman Pty Ltd			**Completed**	24 May 2023
Job No.	E25996.G03			**Logged By**	JO **Date** 24 May 2023
Sheets	1 of 1			**Review By**	ML **Date** 08 August 2023
Drilling Contractor	Geosense Drilling Engineers	**Surface RL**	-	**Northing**	6254460.6730 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	323863.8164 (MGA 2020 Zone 56)

WATER	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION
7/25/2023 7:10:00 AM ▼	BH1M_0.50-0.95 SPT 0.50-0.95 8,15,30 N=45	0.00			ASPHALT: 100mm thick	-
		0.10			FILL: Silty SAND: fine to medium grained, dark brown with sub-angular to sub-rounded gravels, appears well compacted.	D
		0.60			Silty CLAY: low to medium plasticity, pale grey-orange	M < PL
	BH1M_1.50-1.65 SPT 1.50-1.65 18/150 mm HB N=R	1.65			SANDSTONE: fine to medium grained, pale grey-orange, extremely weathered.	-
0% Water		3.00			NO CORE: 1150mm thick	
90% Water		4.15			SANDSTONE: fine to medium grained, pale grey-orange, thinly to medium bedded	
		7.60			Terminated at 7.60m. Target Depth Reached.	

BACKFILL DETAILS	STANDPIPE DETAILS
Grout 0.00m - 0.10m	Well Stickup =0.0m
Sand 0.10m - 2.50m	0.0m - 3.0m PVC casing (50mm Ø)
Bentonite 2.50m - 3.00m	
Sand 3.00m - 7.60m	3.0m - 6.0m PVC screen (50mm Ø)

CORE PHOTOGRAPH OF BOREHOLE: BH1M

Project	Proposed Redevelopment			**Depth Range**	3.0m to 7.60m BEGL		
Location	1H Hospital Road, Concord West, NSW			**Contractor**	Geosense Drilling Engineers Pty Ltd		
Position	See Figure 2	**Surface RL**	≈ -	**Drill Rig**	Comacchio GEO 205		
Job No.	E25669.G03	**Inclination**	-90°	**Logged**	JO	**Date**	24 / 05 / 2023
Client	Lipman Pty Ltd	**Box**	1 of 1	**Checked**	KX	**Date**	16 / 06 / 2023

BOREHOLE LOG

BH ID: BH2

Location	1H Hospital Road, Concord West, NSW		**Started**	24 May 2023	
Client	Lipman Pty Ltd		**Completed**	24 May 2023	
Job No.	E25996.G03		**Logged By**	JO	**Date** 24 May 2023
Sheets	1 of 2		**Review By**	ML	**Date** 08 August 2023
Drilling Contractor	Geosense Drilling Engineers	**Surface RL** -	**Northing**	6254491.6526 (MGA 2020 Zone 56)	
Plant	Comacchio Geo 205	**Inclination** 90°	**Easting**	323813.7977 (MGA 2020 Zone 56)	

METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	SAMPLE RECOVERY	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / REL. DENSITY	MATERIAL ORIGIN & OBSERVATIONS
AD/T	GWNE	BH2_0.50-0.95 SPT 0.50-0.95 4,6,8 N=14		0.00 0.10			ASPHALT: 100mm thick			ASPHALT
							FILL: Silty SAND: fine to medium grained, dark brown with sub-angular to sub-rounded gravels, appears well compacted.	D	-	FILL
				0.60			Silty CLAY: low to medium plasticity, brown	M < PL	St	RESIDUAL SOIL
		BH2_1.50-1.72 SPT 1.50-1.72 7,8/75 mm HB N=R		1.72			SANDSTONE: fine to medium grained, pale grey-orange, extremely weathered.	-	-	WEATHERED ROCK
				3.00			*Log continued on next page.*			

BOREHOLE LOG

BH ID: BH2

Location	1H Hospital Road, Concord West, NSW			**Started**	24 May 2023
Client	Lipman Pty Ltd			**Completed**	24 May 2023
Job No.	E25996.G03			**Logged By**	JO **Date** 24 May 2023
Sheets	2 of 2			**Review By**	ML **Date** 08 August 2023
Drilling Contractor	Geosense Drilling Engineers	**Surface RL**	-	**Northing**	6254491.6526 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	323813.7977 (MGA 2020 Zone 56)

METHOD	Flush Return	TCR %	RQD %	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	WEATHERING	ESTIMATED STRENGTH Is(50) ▼ - Axial ▽ - Diametral (VL 0-1, L 0-3, M 1, H 3, VH 10, EH)	DISCONTINUITIES & ADDITIONAL DATA	FRACTURE SPACING (30, 100, 300, 1000, 3000)
				0			*Log continued from previous page.*				
NMLC	90% Water	78	31	3			SHALE: dark grey-brown, very thinly bedded	DW	▼	3.10-3.15: CS	
				4.24			NO CORE: 360mm thick	-			
		67	15	4.60			SHALE: dark grey-brown, thinly bedded	SW	▼		
				5.50			SANDSTONE: fine to medium grained, pale grey			5.50-5.59: CS	
				5.58			NO CORE: 530mm thick	-			
		100	96	6.11			SANDSTONE: fine to medium grained, pale grey, medium bedded	FR	▼		
				7			Terminated at 7.24m. Target Depth Reached.				
				10							

CORE PHOTOGRAPH OF BOREHOLE: BH2

Project	Proposed Redevelopment			**Depth Range**	3.0m to 7.24m BEGL		
Location	1H Hospital Road, Concord West, NSW			**Contractor**	Geosense Drilling Engineers Pty Ltd		
Position	See Figure 2	**Surface RL**	≈ -	**Drill Rig**	Comacchio GEO 205		
Job No.	E25669.G03	**Inclination**	-90°	**Logged**	JO	**Date**	24 / 05 / 2023
Client	Lipman Pty Ltd	**Box**	1-2 of 2	**Checked**	KX	**Date**	16 / 06 / 2023

BOREHOLE LOG

BH ID: BH3M

Location	1H Hospital Road, Concord West, NSW		**Started**	23 May 2023	
Client	Lipman Pty Ltd		**Completed**	23 May 2023	
Job No.	E25996.G03		**Logged By**	JO	**Date** 23 May 2023
Sheets	1 of 2		**Review By**	ML	**Date** 08 August 2023
Drilling Contractor	Geosense Drilling Engineers	**Surface RL** -	**Northing**	6254391.6565 (MGA 2020 Zone 56)	
Plant	Comacchio Geo 205	**Inclination** 90°	**Easting**	323860.6592 (MGA 2020 Zone 56)	

METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	SAMPLE RECOVERY	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / REL. DENSITY	MATERIAL ORIGIN & OBSERVATIONS
AD/T	7/25/2023 7:15:00 AM ▼	BH9M_0.50-0.95 SPT 0.50-0.95 4,6,8 N=14		0.00			FILL: Clayey SAND: fine to medium grained, dark brown, appears well compacted.	D	-	FILL
				0.30			Silty CLAY: low to medium plasticity, orange-brown	M < PL	St	RESIDUAL SOIL
		BH9M_1.50-1.95 SPT 1.50-1.95 6,7,12 N=19		1.80			From 1.80m, pale grey-orange		VSt	
				2.52			*Log continued on next page.*			

BOREHOLE LOG

BH ID: BH3M

Location	1H Hospital Road, Concord West, NSW			**Started**	23 May 2023
Client	Lipman Pty Ltd			**Completed**	23 May 2023
Job No.	E25996.G03			**Logged By**	JO **Date** 23 May 2023
Sheets	2 of 2			**Review By**	ML **Date** 08 August 2023
Drilling Contractor	Geosense Drilling Engineers	**Surface RL**	-	**Northing**	6254391.6565 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	323860.6592 (MGA 2020 Zone 56)

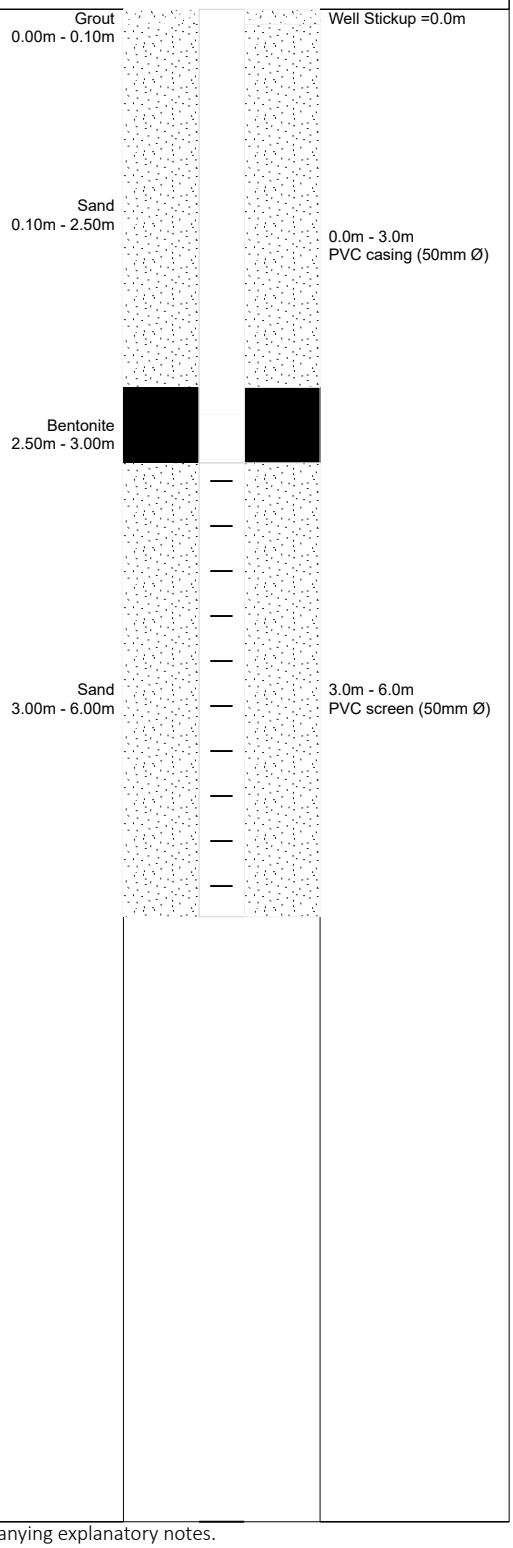
METHOD	Flush Return	TCR %	RQD %	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	WEATHERING	ESTIMATED STRENGTH Is(50) ▼ - Axial ▽ - Diametral (VL 0-1, L 0-3, M 1, H 3, VH 10, EH)	DISCONTINUITIES & ADDITIONAL DATA	FRACTURE SPACING (30, 100, 300, 1000, 3000)
				0			*Log continued from previous page.*				
NMLC	90%	100	26	3			SANDSTONE: fine to medium grained with iron staining and pale grey clay seams, very thinly bedded	DW			
		100	70	3.74			SANDSTONE: fine to medium grained, pale grey-brown mottled orange, very thinly bedded, with shale laminations				
				4.50			From 4.50m, pale grey-brown, thinly bedded	FR			
				6			Terminated at 6.00m. Target Depth Reached.				
				10							

BOREHOLE LOG

BH ID: BH3M

Location	1H Hospital Road, Concord West, NSW			**Started**	23 May 2023
Client	Lipman Pty Ltd			**Completed**	23 May 2023
Job No.	E25996.G03			**Logged By**	JO **Date** 23 May 2023
Sheets	1 of 1			**Review By**	ML **Date** 08 August 2023
Drilling Contractor	Geosense Drilling Engineers	**Surface RL**	-	**Northing**	6254391.6565 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	323860.6592 (MGA 2020 Zone 56)

WATER	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION
7/25/2023 7:15:00 AM ▼	BH9M_0.50-0.95 SPT 0.50-0.95 4,6,8 N=14	0.00			FILL: Clayey SAND: fine to medium grained, dark brown, appears well compacted.	D
		0.30			Silty CLAY: low to medium plasticity, orange-brown	M < PL
	BH9M_1.50-1.95 SPT 1.50-1.95 6,7,12 N=19	1.80			From 1.80m, pale grey-orange	
90%		2.52			SANDSTONE: fine to medium grained with iron staining and pale grey clay seams, very thinly bedded	
		3.74			SANDSTONE: fine to medium grained, pale grey-brown mottled orange, very thinly bedded, with shale laminations	
		4.50			From 4.50m, pale grey-brown, thinly bedded	
		6.00			Terminated at 6.00m. Target Depth Reached.	



CORE PHOTOGRAPH OF BOREHOLE: BH3M

Project	Proposed Redevelopment			**Depth Range**	2.52m to 6.0m BEGL		
Location	1H Hospital Road, Concord West, NSW			**Contractor**	Geosense Drilling Engineers Pty Ltd		
Position	See Figure 2	**Surface RL**	≈ -	**Drill Rig**	Comacchio GEO 205		
Job No.	E25669.G03	**Inclination**	-90°	**Logged**	JO	**Date**	23 / 05 / 2023
Client	Lipman Pty Ltd	**Box**	1 of 1	**Checked**	KX	**Date**	16 / 06 / 2023

BOREHOLE LOG

BH ID: BH4

Location	1H Hospital Road, Concord West, NSW			**Started**	23 May 2023
Client	Lipman Pty Ltd			**Completed**	23 May 2023
Job No.	E25996.G03			**Logged By**	JO **Date** 23 May 2023
Sheets	1 of 2			**Review By**	ML **Date** 08 August 2023
Drilling Contractor	Geosense Drilling Engineers	**Surface RL**	-	**Northing**	6254416.9818 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	323885.7601 (MGA 2020 Zone 56)

METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	SAMPLE RECOVERY	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / REL. DENSITY	MATERIAL ORIGIN & OBSERVATIONS
AD/T	GWNE	BH4_0.50-0.95 SPT 0.50-0.95 8,6,12 N=18		0.00			FILL: Silty SAND: fine to medium grained, dark brown trace sub-angular to sub-rounded gravels, appears well compacted.	D	-	FILL
				0.70			Silty CLAY: low to medium plasticity, pale grey-orange	M < PL	VSt	RESIDUAL SOIL
		BH4_1.50-1.85 SPT 1.50-1.85 14,16,3/50 mm HB N=R		1.85			SANDSTONE: fine to medium grained, pale grey-orange extremely weathered.	-	-	WEATHERED ROCK
				2.70			*Log continued on next page.*			

BOREHOLE LOG

BH ID: BH4

Location	1H Hospital Road, Concord West, NSW			**Started**	23 May 2023
Client	Lipman Pty Ltd			**Completed**	23 May 2023
Job No.	E25996.G03			**Logged By**	JO **Date** 23 May 2023
Sheets	2 of 2			**Review By**	ML **Date** 08 August 2023
Drilling Contractor	Geosense Drilling Engineers	**Surface RL**	-	**Northing**	6254416.9818 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	323885.7601 (MGA 2020 Zone 56)

METHOD	Flush Return	TCR %	RQD %	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	WEATHERING	ESTIMATED STRENGTH Is(50) ▼ - Axial ▽ - Diametral (VL 0-1, L 0-3, M 1, H 3, VH 10, EH)	DISCONTINUITIES & ADDITIONAL DATA	FRACTURE SPACING (30, 100, 300, 1000, 3000)
				0			*Log continued from previous page.*				
				1							
				2							
NMLC	90% Water	96	28	3			SANDSTONE: fine to medium grained, pale grey with iron staining and clay seams, very thinly to thinly bedded	DW	▼		
				3.40			NO CORE: 900mm thick	-			
				4							
				4.30			SANDSTONE: fine to medium grained, pale grey with iron staining and clay seams, thinly to medium bedded	SW	▼	4.34-4.41: XWS	
		100	78	5				FR	▼		
				6			Terminated at 6.00m. Target depth reached.				
				7							
				8							
				9							
				10							

CORE PHOTOGRAPH OF BOREHOLE: BH4

Project	Proposed Redevelopment			**Depth Range**	2.70m to 6.0m BEGL		
Location	1H Hospital Road, Concord West, NSW			**Contractor**	Geosense Drilling Engineers Pty Ltd		
Position	See Figure 2	**Surface RL**	≈ -	**Drill Rig**	Comacchio GEO 205		
Job No.	E25669.G03	**Inclination**	-90°	**Logged**	JO	**Date**	23 / 05 / 2023
Client	Lipman Pty Ltd	**Box**	1 of 1	**Checked**	KX	**Date**	16 / 06 / 2023

BOREHOLE LOG

BH ID: BH5

Location	1H Hospital Road, Concord West, NSW		**Started**	23 May 2023	
Client	Lipman Pty Ltd		**Completed**	23 May 2023	
Job No.	E25996.G03		**Logged By**	JO	**Date** 23 May 2023
Sheets	1 of 2		**Review By**	ML	**Date** 08 August 2023
Drilling Contractor	Geosense Drilling Engineers	**Surface RL** -	**Northing**	6254415.7362 (MGA 2020 Zone 56)	
Plant	Comacchio Geo 205	**Inclination** 90°	**Easting**	323823.2479 (MGA 2020 Zone 56)	

METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	SAMPLE RECOVERY	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / REL. DENSITY	MATERIAL ORIGIN & OBSERVATIONS
AD/T	GWNE	BH4_0.50-0.60 BH4_0.50-0.95 SPT 0.50-0.95 4,10,16 N=26		0.00 0.15 0.60 1 1.40 2 3			ASPHALT: 150mm thick	-	-	ASPHALT
							FILL: Silty SAND: fine to medium grained, brown with sub-angular to sub-rounded gravels, appears well compacted.	D	-	FILL
							Sandy CLAY: low to medium plasticity, pale grey-orange, sand is fine to medium grained	M < PL	VSt	RESIDUAL SOIL
		BH4_1.50-1.68 SPT 1.50-1.68 10,3/35 mm HB N=R					Silty CLAY: low to medium plasticity, pale grey-orange		H	
		BH4_3.00-3.45 SPT 3.00-3.45 20,16,19 N=35								
				3.45			*Log continued on next page.*			
				4 5 6 7 8 9 10						

BOREHOLE LOG

BH ID: BH5

Location	1H Hospital Road, Concord West, NSW			**Started**	23 May 2023
Client	Lipman Pty Ltd			**Completed**	23 May 2023
Job No.	E25996.G03			**Logged By**	JO **Date** 23 May 2023
Sheets	2 of 2			**Review By**	ML **Date** 08 August 2023
Drilling Contractor	Geosense Drilling Engineers	**Surface RL**	-	**Northing**	6254415.7362 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	323823.2479 (MGA 2020 Zone 56)

METHOD	Flush Return	TCR %	RQD %	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	WEATHERING	ESTIMATED STRENGTH Is(50) ▼ - Axial ▽ - Diametral (VL 0-1, L 0-3, M 1, H 3, VH 10, EH)	DISCONTINUITIES & ADDITIONAL DATA	FRACTURE SPACING (30, 100, 300, 1000, 3000)
				0			*Log continued from previous page.*				
				1							
				2							
				3							
NMLC	90% GWNE	100	92	4			SANDSTONE: fine to medium grained, pale grey-orange, thinly to medium bedded	DW			
				5				SW - FR			
				6			Terminated at 6.00m. Target Depth Reached.				
				7							
				8							
				9							
				10							

CORE PHOTOGRAPH OF BOREHOLE: BH5

Project	Proposed Redevelopment			**Depth Range**	3.45m to 6.0m BEGL		
Location	1H Hospital Road, Concord West, NSW			**Contractor**	Geosense Drilling Engineers Pty Ltd		
Position	See Figure 2	**Surface RL**	≈ -	**Drill Rig**	Comacchio GEO 205		
Job No.	E25669.G03	**Inclination**	-90°	**Logged**	JO	**Date**	23 / 05 / 2023
Client	Lipman Pty Ltd	**Box**	1 of 1	**Checked**	KX	**Date**	16 / 06 / 2023

BOREHOLE LOG

BH ID: BH6M

Location	1H Hospital Road, Concord West, NSW		**Started**	22 May 2023	
Client	Lipman Pty Ltd		**Completed**	22 May 2023	
Job No.	E25996.G03		**Logged By**	JO	**Date** 22 May 2023
Sheets	1 of 2		**Review By**	ML	**Date** 08 August 2023
Drilling Contractor	Geosense Drilling Engineers	**Surface RL** -	**Northing**	6254392.3215 (MGA 2020 Zone 56)	
Plant	Comacchio Geo 205	**Inclination** 90°	**Easting**	323853.4352 (MGA 2020 Zone 56)	

METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	SAMPLE RECOVERY	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / REL. DENSITY	MATERIAL ORIGIN & OBSERVATIONS
AD/T	7/25/2023 7:20:00 AM	BH12M_0.50-0.95 SPT 0.50-0.95 4,5,6 N=11		0.00			FILL: Sandy CLAY: low to medium plasticity, brown-orange, with sub-angular to sub-rounded gravels, appears well compacted.	D	-	FILL
		BH12M_1.50-1.95 SPT 1.50-1.95 3,5,7 N=12		1.60			Silty CLAY: low to medium plasticity, pale grey-orange	M < PL	St	RESIDUAL SOIL
				2.30			*Log continued on next page.*			

BOREHOLE LOG

BH ID: BH6M

Location	1H Hospital Road, Concord West, NSW			**Started**	22 May 2023
Client	Lipman Pty Ltd			**Completed**	22 May 2023
Job No.	E25996.G03			**Logged By**	JO **Date** 22 May 2023
Sheets	2 of 2			**Review By**	ML **Date** 08 August 2023
Drilling Contractor	Geosense Drilling Engineers	**Surface RL**	-	**Northing**	6254392.3215 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	323853.4352 (MGA 2020 Zone 56)

METHOD	Flush Return	TCR %	RQD %	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	WEATHERING	ESTIMATED STRENGTH Is(50) ▼ - Axial ▽ - Diametral (VL 0-1, L 0-3, M 1, H 3, VH 10, EH)	DISCONTINUITIES & ADDITIONAL DATA	FRACTURE SPACING (30, 100, 300, 1000, 3000)
				0			*Log continued from previous page.*				
				1							
				2							
NMLC	0%	46	25	2.43			SANDSTONE: fine to medium grained, pale grey, thinly to medium bedded	DW		2.43-2.73: CZ	
				2.73			NO CORE: 1470mm thick	-			
				3							
				4							
				4.20			SANDSTONE: fine to medium grained, pale grey-orange, medium bedded	FR			
		100	100	5							
				6							
				7							
							Terminated at 7.20m. Target depth reached.				
				8							
				9							
				10							

BOREHOLE LOG

BH ID: BH6M

Location	1H Hospital Road, Concord West, NSW			**Started**	22 May 2023
Client	Lipman Pty Ltd			**Completed**	22 May 2023
Job No.	E25996.G03			**Logged By**	JO **Date** 22 May 2023
Sheets	1 of 1			**Review By**	ML **Date** 08 August 2023
Drilling Contractor	Geosense Drilling Engineers	**Surface RL**	-	**Northing**	6254392.3215 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	323853.4352 (MGA 2020 Zone 56)

WATER	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION
7/25/2023 7:20:00 AM	BH12M_0.50-0.95 SPT 0.50-0.95 4,5,6 N=11	0.00			FILL: Sandy CLAY: low to medium plasticity, brown-orange, with sub-angular to sub-rounded gravels, appears well compacted.	D
	BH12M_1.50-1.95 SPT 1.50-1.95 3,5,7 N=12	1.60			Silty CLAY: low to medium plasticity, pale grey-orange	M < PL
0%		2.30			SANDSTONE: fine to medium grained, pale grey, thinly to medium bedded	
		2.73			NO CORE: 1470mm thick	
		4.20			SANDSTONE: fine to medium grained, pale grey-orange, medium bedded	
		7.20			Terminated at 7.20m. Target depth reached.	

BACKFILL DETAILS

Grout 0.00m - 0.10m

Sand 0.10m - 2.50m

Bentonite 2.50m - 3.00m

Sand 3.00m - 7.20m

STANDPIPE DETAILS

Well Stickup =0.0m

0.0m - 3.0m PVC casing (50mm Ø)

3.0m - 6.0m PVC screen (50mm Ø)

CORE PHOTOGRAPH OF BOREHOLE: BH6M

Project	Proposed Redevelopment			**Depth Range**	2.3m to 7.2m BEGL		
Location	1H Hospital Road, Concord West, NSW			**Contractor**	Geosense Drilling Engineers Pty Ltd		
Position	See Figure 2	**Surface RL**	≈ -	**Drill Rig**	Comacchio GEO 205		
Job No.	E25669.G03	**Inclination**	-90°	**Logged**	JO	**Date**	22 / 05 / 2023
Client	Lipman Pty Ltd	**Box**	1 of 1	**Checked**	KX	**Date**	16 / 06 / 2023

BOREHOLE LOG

BH ID: BH7

Location	1H Hospital Road, Concord West, NSW	**Started**	24 May 2023		
Client	Lipman Pty Ltd	**Completed**	24 May 2023		
Job No.	E25996.G03	**Logged By**	JO	**Date**	24 May 2023
Sheets	1 of 2	**Review By**	ML	**Date**	08 August 2023
Drilling Contractor	Geosense Drilling Engineers	**Surface RL**	-	**Northing**	6254445.9364 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	323879.7716 (MGA 2020 Zone 56)

METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	SAMPLE RECOVERY	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / REL. DENSITY	MATERIAL ORIGIN & OBSERVATIONS
AD/T	GWNE	BH7_0.50-0.95 SPT 0.50-0.95 5,5,13 N=18		0.00 0.10			ASPHALT: 100mm thick	-	-	ASPHALT
							FILL: Silty SAND: fine to medium grained, dark brown with sub-angular to sub-rounded gravels, appears well compacted.	D	-	FILL
				0.80 1			Silty CLAY: low to medium plasticity, brown-orange trace sub-angular to sub-rounded gravels	M < PL	VSt	RESIDUAL SOIL
		BH7_1.50-1.80 SPT 1.50-1.80 8,21/150 mm HB N=R		1.60 2			SANDSTONE: fine to medium grained, pale grey, extremely weathered.	-	-	WEATHERED ROCK
				3			*Log continued on next page.*			
				3.00 4 5 6 7 8 9 10						

BOREHOLE LOG

BH ID: BH7

Location	1H Hospital Road, Concord West, NSW			**Started**	24 May 2023
Client	Lipman Pty Ltd			**Completed**	24 May 2023
Job No.	E25996.G03			**Logged By**	JO **Date** 24 May 2023
Sheets	2 of 2			**Review By**	ML **Date** 08 August 2023
Drilling Contractor	Geosense Drilling Engineers	**Surface RL**	-	**Northing**	6254445.9364 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	323879.7716 (MGA 2020 Zone 56)

METHOD	Flush Return	TCR %	RQD %	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	WEATHERING	ESTIMATED STRENGTH Is(50) ▼ - Axial ▽ - Diametral (VL 0-1, L 0-3, M 1, H 3, VH 10, EH)	DISCONTINUITIES & ADDITIONAL DATA	FRACTURE SPACING (30, 100, 300, 1000, 3000)
				0			*Log continued from previous page.*				
				1							
				2							
				3			NO CORE: 200mm thick	-			
NMLC	90% Water	93	60	3.20			SANDSTONE: fine to medium grained, pale grey-brown, thinly to medium bedded	SW	▼	3.20-3.25: XWS	
				4					▼		
				5				FR	▼		
				6			Terminated at 6.00m. Target Depth Reached.				
				7							
				8							
				9							
				10							

CORE PHOTOGRAPH OF BOREHOLE: BH7

Project	Proposed Redevelopment			**Depth Range**	3.0m to 6.0m BEGL		
Location	1H Hospital Road, Concord West, NSW			**Contractor**	Geosense Drilling Engineers Pty Ltd		
Position	See Figure 2	**Surface RL**	≈ -	**Drill Rig**	Comacchio GEO 205		
Job No.	E25669.G03	**Inclination**	-90°	**Logged**	JO	**Date**	24 / 05 / 2023
Client	Lipman Pty Ltd	**Box**	1 of 1	**Checked**	KX	**Date**	16 / 06 / 2023

EXPLANATION OF NOTES, ABBREVIATIONS & TERMS USED ON BOREHOLE AND TEST PIT LOGS

DRILLING/EXCAVATION METHOD

HA	Hand Auger	**ADH**	Hollow Auger	**NQ**	Diamond Core - 47 mm
DT	Diatube Coring	**RT**	Rotary Tricone bit	**NMLC**	Diamond Core - 52 mm
NDD	Non-destructive digging	**RAB**	Rotary Air Blast	**HQ**	Diamond Core - 63 mm
AD*	Auger Drilling	**RC**	Reverse Circulation	**HMLC**	Diamond Core - 63 mm
***V**	V-Bit	**PT**	Push Tube	**EX**	Tracked Hydraulic Excavator
***T**	TC-Bit, e.g. AD/T	**WB**	Washbore	**HAND**	Excavated by Hand Methods

PENETRATION RESISTANCE

L	**Low Resistance**	Rapid penetration/ excavation possible with little effort from equipment used.
M	**Medium Resistance**	Penetration/ excavation possible at an acceptable rate with moderate effort from equipment used.
H	**High Resistance**	Penetration/ excavation is possible but at a slow rate and requires significant effort from equipment used.
R	**Refusal/Practical Refusal**	No further progress possible without risk of damage or unacceptable wear to equipment used.

These assessments are subjective and are dependent on many factors, including equipment power and weight, condition of excavation or drilling tools and experience of the operator.

WATER

Standing Water Level — **Partial water loss**

Water Seepage — **Complete Water Loss**

GWNO	GROUNDWATER NOT OBSERVED - Observation of groundwater, whether present or not, was not possible due to drilling water, surface seepage or cave-in of the borehole/ test pit.
GWNE	GROUNDWATER NOT ENCOUNTERED - Borehole/ test pit was dry soon after excavation. However, groundwater could be present in less permeable strata. Inflow may have been observed had the borehole/ test pit been left open for a longer period.

SAMPLING AND TESTING

SPT	Standard Penetration Test to AS1289.6.3.1-2004
4,7,11 N=18	4,7,11 = Blows per 150mm. N = Blows per 300mm penetration following a 150mm seating drive
30/80mm	Where practical refusal occurs, the blows and penetration for that interval are reported, N is not reported
RW	Penetration occurred under the rod weight only, N<1
HW	Penetration occurred under the hammer and rod weight only, N<1
HB	Hammer double bouncing on anvil, N is not reported
Sampling	
DS	Disturbed Sample
ES	Sample for environmental testing
BDS	Bulk disturbed Sample
GS	Gas Sample
WS	Water Sample
U50	Thin walled tube sample - number indicates nominal sample diameter in millimetres
Testing	
FP	Field Permeability test over section noted
FVS	Field Vane Shear test expressed as uncorrected shear strength (sv= peak value, sr= residual value)
PID	Photoionisation Detector reading in ppm
PM	Pressuremeter test over section noted
PP	Pocket Penetrometer test expressed as instrument reading in kPa
WPT	Water Pressure tests
DCP	Dynamic Cone Penetrometer test
CPT	Static Cone Penetration test
CPTu	Static Cone Penetration test with pore pressure (u) measurement

GEOLOGICAL BOUNDARIES

———— = Observed Boundary (position known)

– – – – – – – – – – = Observed Boundary (position approximate)

– –?– –?– –?– – = Boundary (interpreted or inferred)

ROCK CORE RECOVERY

TCR=Total Core Recovery (%)

$$= \frac{\textit{Length of core recovered}}{\textit{Length of core run}} \times 100$$

RQD = Rock Quality Designation (%)

$$= \frac{\sum \textit{Axial lengths of core} > 100mm}{\textit{Length of core run}} \times 100$$

METHOD OF SOIL DESCRIPTION USED ON BOREHOLE AND TEST PIT LOGS

FILL

COUBLES or BOULDERS

GRAVEL (GP or GW)

ORGANIC SOILS (OL, OH or Pt)

SILT (ML or MH)

CLAY (CL, CI or CH)

SAND (SP or SW)

Combinations of these basic symbols may be used to indicate mixed materials such as sandy clay

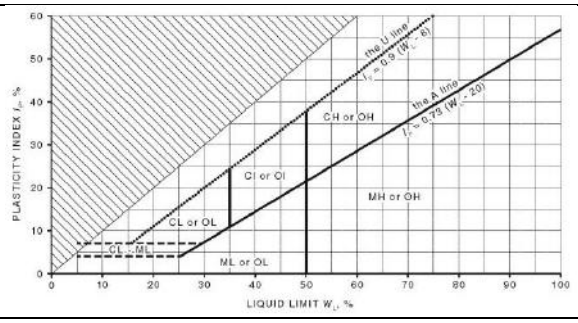
CLASSIFICATION AND INFERRED STRATIGRAPHY

Soil is broadly classified and described in Borehole and Test Pit Logs using the preferred method given in AS 1726:2017, Section 6.1 – Soil description and classification.

PARTICLE SIZE CHARACTERISTICS

Fraction	Components	Sub Division	Size mm
Oversize	BOULDERS		>200
	COBBLES		63 to 200
Coarse grained soil	GRAVEL	Coarse	19 to 63
		Medium	6.7 to 19
		Fine	2.36 to 6.7
	SAND	Coarse	0.6 to 2.36
		Medium	0.21 to 0.6
		Fine	0.075 to 0.21
Fine grained soil	SILT		0.002 to 0.075
	CLAY		<0.002

PLASTICITY PROPERTIES



GROUP SYMBOLS

Major Divisions		Symbol	Description
COARSE GRAINED SOILS More than 65% of soil excluding oversize fraction is greater than 0.075mm	GRAVEL More than 50% of coarse fraction is >2.36mm	GW	Well graded gravel and gravel-sand mixtures, little or no fines, no dry strength.
		GP	Poorly graded gravel and gravel-sand mixtures, little or no fines, no dry strength.
		GM	Silty gravel, gravel-sand-silt mixtures, zero to medium dry strength.
		GC	Clayey gravel, gravel-sand-clay mixtures, medium to high dry strength.
	SAND More than 50% of coarse fraction is <2.36 mm	SW	Well graded sand and gravelly sand, little or no fines, no dry strength.
		SP	Poorly graded sand and gravelly sand, little or no fines, no dry strength.
		SM	Silty sand, sand-silt mixtures, zero to medium dry strength.
		SC	Clayey sand, sandy-clay mixtures, medium to high dry strength.
FINE GRAINED SOILS More than 35% of soil excluding oversized fraction is less than 0.075mm	Liquid Limit less < 50%	ML	Inorganic silts of low plasticity, very fine sands, rock flour, silty or clayey fine sands, zero to medium dry strength.
		CL, CI	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, medium to high dry strength.
		OL	Organic silts and organic silty clays of low plasticity, low to medium dry strength.
	Liquid Limit > than 50%	MH	Inorganic silts of high plasticity, high to very high dry strength.
		CH	Inorganic clays of high plasticity, high to very high dry strength.
		OH	Organic clays of medium to high plasticity, medium to high dry strength.
Highly Organic soil		PT	Peat muck and other highly organic soils.

MOISTURE CONDITION

Symbol	Term	Description
D	Dry	Non- cohesive and free-running.
M	Moist	Soils feel cool, darkened in colour. Soil tends to stick together.
W	Wet	Soils feel cool, darkened in colour. Soil tends to stick together, free water forms when handling.

Moisture content of cohesive soils shall be described in relation to plastic limit (PL) or liquid limit (LL) for soils with higher moisture content as follows: Moist, dry of plastic limit (w < PL); Moist, near plastic limit (w ≈ PL); Moist, wet of plastic limit (w < PL); Wet, near liquid limit (w ≈ LL), Wet, wet of liquid limit (w > LL),

CONSISTENCY

Symbol	Term	Undrained Shear Strength (kPa)	SPT "N" #
VS	Very Soft	≤ 12	≤ 2
S	Soft	>12 to ≤ 25	>2 to ≤ 4
F	Firm	>25 to ≤ 50	>4 to 8
St	Stiff	>50 to ≤ 100	>8 to 15
VSt	Very Stiff	>100 to ≤ 200	>15 to 30
H	Hard	>200	>30
Fr	Friable	-	

DENSITY

Symbol	Term	Density Index %	SPT "N" #
VL	Very Loose	≤ 15	0 to 4
L	Loose	>15 to ≤ 35	4 to 10
MD	Medium Dense	>35 to ≤ 65	10 to 30
D	Dense	>65 to ≤ 85	30 to 50
VD	Very Dense	>85	Above 50

In the absence of test results, consistency and density may be assessed from correlations with the observed behaviour of the material. # SPT correlations are not stated in AS1726:2017, and may be subject to corrections for overburden pressure, moisture content of the soil, and equipment type.

MINOR COMPONENTS

Term	Assessment Guide	Proportion by Mass
Add 'Trace'	Presence just detectable by feel or eye but soil properties little or no different to general properties of primary component	Coarse grained soils: ≤ 5% Fine grained soil: ≤ 15%
Add 'With'	Presence easily detectable by feel or eye but soil properties little or no different to general properties of primary component	Coarse grained soils: 5 - 12% Fine grained soil: 15 - 30%
Prefix soil name	Presence easily detectable by feel or eye in conjunction with the general properties of primary component	Coarse grained soils: >12% Fine grained soil: >30%

TERMS FOR ROCK MATERIAL STRENGTH AND WEATHERING

CLASSIFICATION AND INFERRED STRATIGRAPHY

Rock is broadly classified and described in Borehole and Test Pit Logs using the preferred method given in AS1726 – 2017, Section 6.2 – Rock identification, description and classification.

ROCK MATERIAL STRENGTH CLASSIFICATION

Symbol	Term	Point Load Index, $Is_{(50)}$ (MPa) #	Field Guide
VL	Very Low	0.03 to 0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with knife; too hard to cut a triaxial sample by hand. Pieces up to 30 mm can be broken by finger pressure.
L	Low	0.1 to 0.3	Easily scored with a knife; indentations 1 mm to 3 mm show in the specimen with firm blows of pick point; has dull sound under hammer. A piece of core 150 mm long by 50 mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
M	Medium	0.3 to 1	Readily scored with a knife; a piece of core 150 mm long by 50 mm diameter can be broken by hand with difficulty.
H	High	1 to 3	A piece of core 150 mm long by 50 mm diameter cannot be broken by hand but can be broken with pick with a single firm blow; rock rings under hammer.
VH	Very High	3 to 10	Hand specimen breaks with pick after more than one blow; rock rings under hammer.
EH	Extremely High	>10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.

 # Rock Strength Test Results

▼ Point Load Strength Index, $Is_{(50)}$, Axial test (MPa)

● Point Load Strength Index, $Is_{(50)}$, Diametral test (MPa)

Relationship between rock strength test result ($Is_{(50)}$) and unconfined compressive strength (UCS) will vary with rock type and strength, and should be determined on a site-specific basis. However UCS is typically 20 x $Is_{(50)}$.

ROCK MATERIAL WEATHERING CLASSIFICATION

Symbol		Term	Field Guide
RS		Residual Soil	Soil developed on extremely weathered rock; the mass structure and substance fabric are no longer evident; there is a large change in volume but the soil has not been significantly transported.
XW		Extremely Weathered	Rock is weathered to such an extent that it has soil properties - i.e. it either disintegrates or can be remoulded, in water.
DW	HW	Distinctly Weathered	Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores. In some environments it is convenient to subdivide into Highly Weathered and Moderately Weathered, with the degree of alteration typically less for MW.
	MW		
SW		Slightly Weathered	Rock slightly discoloured but shows little or no change of strength relative to fresh rock.
FR		Fresh	Rock shows no sign of decomposition or staining.

ABBREVIATIONS AND DESCRIPTIONS FOR ROCK MATERIAL AND DEFECTS

CLASSIFICATION AND INFERRED STRATIGRAPHY
Rock is broadly classified and described in Borehole and Test Pit Logs using the preferred method given in AS1726 – 2017, Section 6.2 – Rock identification, description and classification.

DETAILED ROCK DEFECT SPACING

Defect Spacing

Spacing/width (mm)	Descriptor	Symbol
<20	Extremely Close	EC
20-60	Very Close	VC
60-200	Close	C
200-600	Medium	M
600-2000	Wide	W
2000-6000	Very Wide	VW

Bedding Thickness (Stratification)

Term	Spacing (mm)
Thinly laminated	<6
Laminated	6 – 20
Very thinly bedded	20 – 60
Thinly bedded	60 – 200
Medium bedded	200 – 600
Thickly bedded	600 – 2,000
Very thickly bedded	> 2,000

ABBREVIATIONS AND DESCRIPTIONS FOR DEFECT TYPES

Defect Type	Abbr.	Description
Joint	JT	Surface of a fracture or parting, formed without displacement, across which the rock has little or no tensile strength. May be closed or filled by air, water or soil or rock substance, which acts as cement.
Bedding Parting	BP	Surface of fracture or parting, across which the rock has little or no tensile strength, parallel or sub-parallel to layering/ bedding. Bedding refers to the layering or stratification of a rock, indicating orientation during deposition, resulting in planar anisotropy in the rock material.
Contact	CO	The surface between two types or ages of rock.
Sheared Surface	SSU	A near planar, curved or undulating surface which is usually smooth, polished or slickensided.
Sheared Seam/ Zone (Fault)	SS/SZ	Seam or zone with roughly parallel almost planar boundaries of rock substance cut by closely spaced (often <50 mm) parallel and usually smooth or slickensided joints or cleavage planes.
Crushed Seam/ Zone (Fault)	CS/CZ	Seam or zone composed of disoriented usually angular fragments of the host rock substance, with roughly parallel near-planar boundaries. The brecciated fragments may be of clay, silt, sand or gravel sizes or mixtures of these.
Extremely Weathered Seam/ Zone	XWS/XWZ	Seam of soil substance, often with gradational boundaries, formed by weathering of the rock material in places.
Infilled Seam	IS	Seam of soil substance, usually clay or clayey, with very distinct roughly parallel boundaries, formed by soil migrating into joint or open cavity.
Vein	VN	Distinct sheet-like body of minerals crystallised within rock through typically open-space filling or crack-seal growth.

NOTE: Defects size of <100mm SS, CS and XWS. Defects size of >100mm SZ, CZ and XWZ.

ABBREVIATIONS AND DESCRIPTIONS FOR DEFECT SHAPE AND ROUGHNESS

Shape	Abbr.	Description	Roughness	Abbr.	Description
Planar	PR	Consistent orientation	Polished	POL	Shiny smooth surface
Curved	CU	Gradual change in orientation	Slickensided	SL	Grooved or striated surface, usually polished
Undulating	UN	Wavy surface	Smooth	SM	Smooth to touch. Few or no surface irregularities
Stepped	ST	One or more well defined steps	Rough	RO	Many small surface irregularities (amplitude generally <1mm). Feels like fine to coarse sandpaper
Irregular	IR	Many sharp changes in orientation	Very Rough	VR	Many large surface irregularities, amplitude generally >1mm. Feels like very coarse sandpaper

Orientation: **Vertical Boreholes –** The dip (inclination from horizontal) of the defect.
Inclined Boreholes – The inclination is measured as the acute angle to the core axis.

ABBREVIATIONS AND DESCRIPTIONS FOR DEFECT COATING

Coating	Abbr.	Description
Clean	CN	No visible coating or infilling
Stain	SN	No visible coating but surfaces are discoloured by staining, often limonite (orange-brown)
Veneer	VNR	A visible coating of soil or mineral substance, usually too thin to measure (< 1 mm); may be patchy

DEFECT APERTURE

Aperture	Abbr.	Description
Closed	CL	Closed.
Open	OP	Without any infill material.
Infilled	-	Soil or rock i.e. clay, silt, talc, pyrite, quartz, etc.

Appendix B – Laboratory Certificates

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Jacky Ong
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	jacky.ong@eiaustralia.com.au
Project	**E25996.G03 1H Hospital Road, Concord NSW**
Order Number	**E25996.G03**
Samples	3

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE248316 R0**
Date Received	30/5/2023
Date Reported	6/6/2023

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

SIGNATORIES

Shane MCDERMOTT

Inorganic/Metals Chemist

Soluble Anions (1:5) in Soil/Solids by Ion Chromatography [AN245] Tested: 6/6/2023

PARAMETER	UOM	LOR	BH1M_1.5-1.65 SOIL - 23/5/2023 SE248316.001	BH7_1.5-1.8 SOIL - 24/5/2023 SE248316.002	BH5_3-3.45 SOIL - 23/5/2023 SE248316.003
Chloride	mg/kg	0.25	**290**	**70**	**520**
Sulfate	mg/kg	5	**160**	**91**	**170**

pH in soil (1:5) [AN101] Tested: 5/6/2023

PARAMETER	UOM	LOR	BH1M_1.5-1.65 SOIL - 23/5/2023 SE248316.001	BH7_1.5-1.8 SOIL - 24/5/2023 SE248316.002	BH5_3-3.45 SOIL - 23/5/2023 SE248316.003
pH	pH Units	0.1	**5.1**	**5.5**	**4.3**

Conductivity and TDS by Calculation - Soil [AN106] Tested: 5/6/2023

PARAMETER	UOM	LOR	BH1M_1.5-1.65 SOIL - 23/5/2023 SE248316.001	BH7_1.5-1.8 SOIL - 24/5/2023 SE248316.002	BH5_3-3.45 SOIL - 23/5/2023 SE248316.003
Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	**240**	**110**	**480**

Moisture Content [AN002] Tested: 2/6/2023

PARAMETER	UOM	LOR	BH1M_1.5-1.65 SOIL - 23/5/2023 SE248316.001	BH7_1.5-1.8 SOIL - 24/5/2023 SE248316.002	BH5_3-3.45 SOIL - 23/5/2023 SE248316.003
% Moisture	%w/w	1	**9.9**	**11.4**	**12.6**

METHOD SUMMARY

SE248316 R0

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode and is calibrated against 3 buffers purchased commercially. For soils, sediments and sludges, an extract with water (or 0.01M CaCl2) is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
AN106	Conductivity and TDS by Calculation: Conductivity is measured by meter with temperature compensation and is calibrated against a standard solution of potassium chloride. Conductivity is generally reported as µmhos /cm or µS/cm @ 25°C. For soils, an extract of as received sample with water is made at a ratio of 1:5 and the EC determined and reported on the extract, or calculated back to the as-received sample. Salinity can be estimated from conductivity using a conversion factor, which for natural waters, is in the range 0.55 to 0.75. Reference APHA 2510 B.
AN245	Anions by Ion Chromatography: A water sample is injected into an eluent stream that passes through the ion chromatographic system where the anions of interest ie Br, Cl, NO2, NO3 and SO4 are separated on their relative affinities for the active sites on the column packing material. Changes to the conductivity and the UV-visible absorbance of the eluent enable identification and quantitation of the anions based on their retention time and peak height or area. APHA 4110 B

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
**	Indicative data, theoretical holding time exceeded.	NVL	Not validated.	LOR	Limit of Reporting.
***	Indicates that both * and ** apply.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

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Atterberg Limits and Linear Shrinkage Report

Project: E25996.G03 - 1H Hospital Road, Concord — Project No.: 31380

Client: EI Australia Pty Ltd — Report No.: 23/1820

Address: Suite 6.01, 55 Miller Street, Pyrmont NSW 2009 — Report Date: 22/06/2023

Test Method: AS1289.3.1.2, 3.2.1, 2.1.1 — Page: 1 of 1

Sampling Procedure: Samples Supplied By Client (Not covered under NATA Scope of Accreditation)

STS / Sample No.	7694D-L/2	7694D-L/4	7694D-L/5	7694D-L/7		
Sample Location	BH 01M	BH 04	BH 07	BH 05		
Material Description	Silty Sandy Clay, brown trace of gravel	Silty Clay, grey orange brown trace of gravel	Silty Clay, light grey trace of gravel	Silty Clay, light grey brown trace of gravel		
Depth (m)	1.50 - 1.65	1.50 - 1.85	1.50 - 1.80	1.50 - 1.68		
Sample Date	29/05/2023	29/05/2023	29/05/2023	29/05/2023		
Sample History	Oven Dried	Oven Dried	Oven Dried	Oven Dried		
Method of Preparation	Dry Sieved	Dry Sieved	Dry Sieved	Dry Sieved		
Liquid Limit (%)	**37**	**39**	**36**	**40**		
Plastic Limit (%)	**20**	**21**	**21**	**21**		
Plasticity Index	**17**	**18**	**15**	**19**		
Linear Shrinkage (%)	**N/A**	**N/A**	**N/A**	**N/A**		
Mould Size (mm)	N/A	N/A	N/A	N/A		
Crumbing	N/A	N/A	N/A	N/A		
Curling	N/A	N/A	N/A	N/A		

Remarks:

Approved Signatory.....

Technician: BV

Orlando Mendoza - Laboratory Manager

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Moisture Content of Soil and Aggregate Samples

Project: E25996.G03 - 1H Hospital Road, Concord — Project No.: 31380

Client: EI Australia Pty Ltd — Report No.: 23/1819

Address: Suite 6.01, 55 Miller Street, Pyrmont NSW 2009 — Report Date: 22/06/2023

Test Method: AS1289.2.1.1 — Page: 1 of 2

Sampling Procedure: Samples Supplied By Client (Not covered under NATA Scope of Accreditation)

STS / Sample No.	7694D-L/2	7694D-L/3	7694D-L/4	7694D-L/5	7694D-L/6	7694D-L/7
Sample Location	BH 01M	BH 02	BH 04	BH 07	BH 03M	BH 05
Material Description	Silty Sandy Clay, brown trace of gravel	Silty Clay, grey orange brown with sand and gravel	Silty Clay, grey orange brown trace of gravel	Silty Clay, light grey trace of gravel	Silty Clay, pale grey orange brown trace of sand and gravel	Silty Clay, light grey brown trace of gravel
Depth (mm)	1.50 - 1.65	1.50 - 1.725	1.50 - 1.685	1.50 - 1.80	1.5 - 1.95	1.50 - 1.68
Sample Date	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023	29/05/2023
Moisture Content (%)	**10.8**	**17.0**	**13.0**	**12.1**	**17.0**	**11.8**

Remarks:

Approved Signatory..... .....

Technician: BV — Orlando Mendoza - Laboratory Manager

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Moisture Content of Soil and Aggregate Samples

Project: E25996.G03 - 1H Hospital Road, Concord — Project No.: 31380

Client: EI Australia Pty Ltd — Report No.: 23/1819

Address: Suite 6.01, 55 Miller Street, Pyrmont NSW 2009 — Report Date: 22/06/2023

Test Method: AS1289.2.1.1 — Page: 2 of 2

Sampling Procedure: Samples Supplied By Client (Not covered under NATA Scope of Accreditation)

STS / Sample No.	7694D-L/8					
Sample Location	BH 06M					
Material Description	Silty Clay, pale grey orange brown trace of sand and gravel					
Depth (mm)	1.50 - 1.95					
Sample Date	29/05/2023					
Moisture Content (%)	**22.6**					

Remarks:

Approved Signatory..... .....

Technician: BV — Orlando Mendoza - Laboratory Manager

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California Bearing Ratio Determination Report

Project: E25996.G03 - 1H Hospital Road, Concord
Client: EI Australia Pty Ltd
Address: Suite 6.01, 55 Miller Street, Pyrmont NSW 2009
Test Method: AS1289.6.1.1, 5.1.1, 2.1.1
No. of Days Soaked: 4

Project No.: 31380
Report No.: 23/1822
Report Date: 22/06/2023
Page: 1 of 1
Compactive Effort: Standard
Target Compaction (%): 100
Surcharge (Kg): 9

Sampling Procedure: Samples Supplied By Client (Not covered under NATA Scope of Accreditation)

STS / Sample No.		7694D-L/1					
Sample Location		BH 6					
Material Description		Silty Clay, orange red brown wih sand and gravel					
Depth of Sample (m)		1.50 - 1.60					
Sample Date		29/05/2023					
Oversize on Wet Basis +19mm (%)		3.0					
Field Moisture Content (%)		14.8					
Optimum Moisture Content (%)		16.4					
Maximum Dry Density (t/m³)		1.784					
Dry Density (t/m³)	Before Soaking	1.785					
	After Soaking	1.765					
Relative Compaction (%)	Before Soaking	100					
	After Soaking	99					
Moisture Content (%)	Before Soaking	16.6					
	After Soaking	20.5					
Moisture Ratio Before Soaking (%)		101.5					
Moisture Content after test (%)	Top 30mm	20.1					
	Entire Depth	19.5					
Swell after Soaking (%)		1.1					
CBR Value (%)		**8.0**					
Penetration (mm)		**2.5**					

Remarks: +19mm material excluded from test

Approved Signatory.....

Technician: BV

Orlando Mendoza - Laboratory Manager

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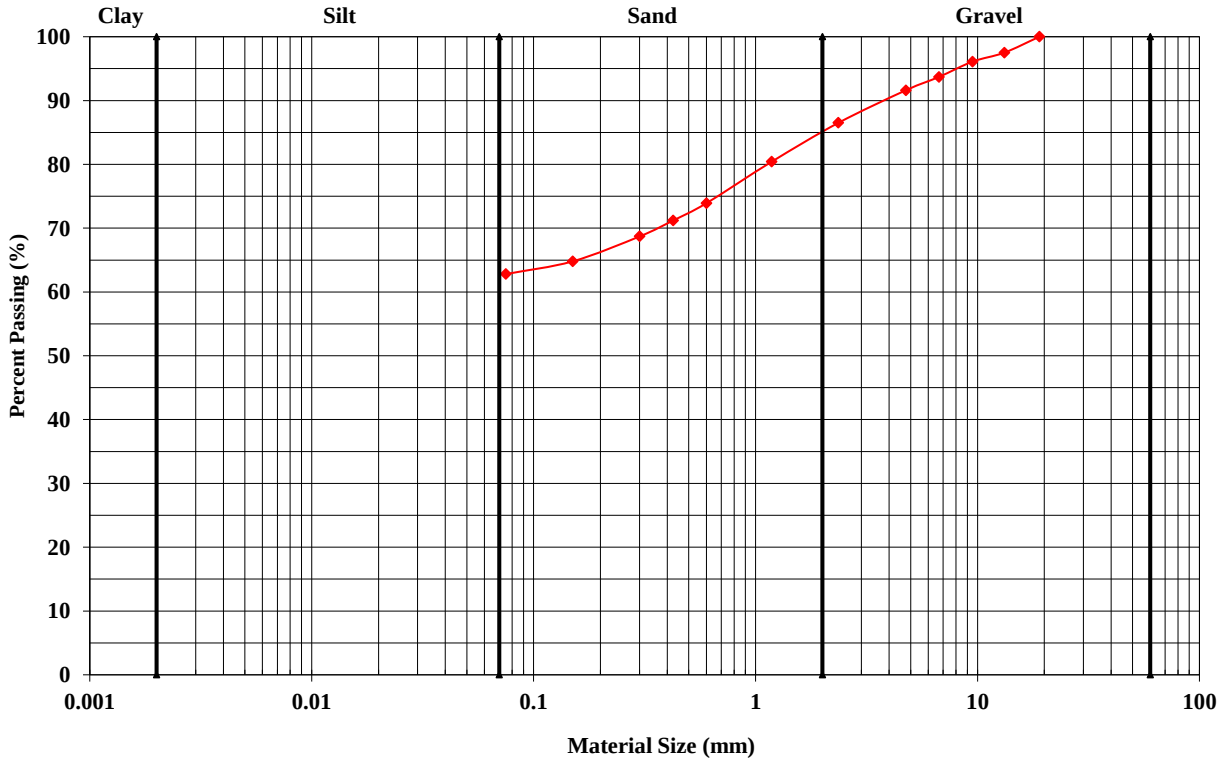
Particle Size Distribution

Project: 1H Hospital Road, Concord
Client: EI Australia Pty Ltd
Address: Suite 6.01, 55 Miller Street, Pyrmont NSW 2009
Test Method: AS1289.3.6.1, 2.1.1
Sampling Procedure: Samples Supplied By Client (Not covered under NATA Scope of Accreditation)
Material Description: Silty Clay, grey orange brown, with sand and gravel

STS / Sample No.: 7694D-L/3
Sample Location: BH 02
Depth (m): 1.50 - 1.72
Date Sampled: 29/5/23

Project No.: 31380
Report No.: 23/1821
Report Date: 22/06/2023
Page: 1 of 3
Client Project No: E25996.G03



Sieve Size (mm)	Percent Passing (%)
19.0	100.0
13.2	97.5
9.5	96.1
6.7	93.7
4.75	91.6
2.36	86.5
1.18	80.4
0.60	73.9
0.425	71.2
0.30	68.7
0.15	64.8
0.075	62.8

Remarks:

Approved Signatory.....

Technician: BV

Orlando Mendoza - Laboratory Manager

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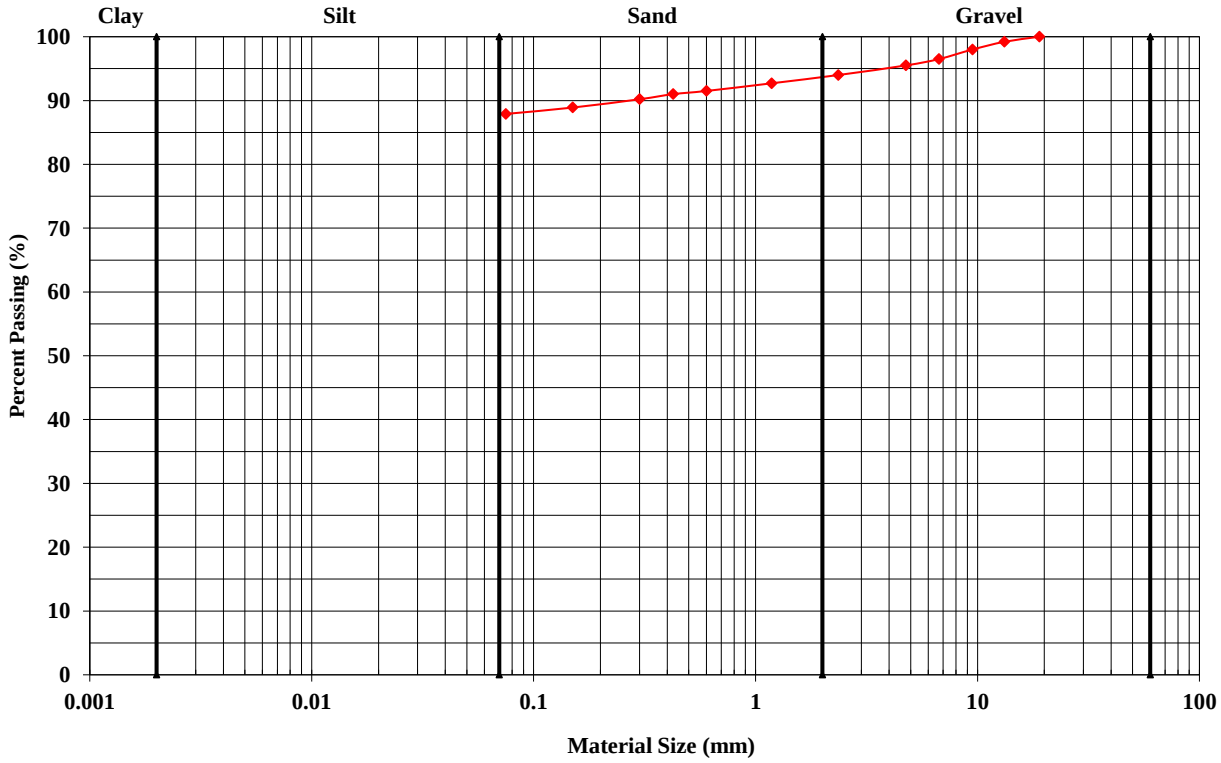
Particle Size Distribution

Project: 1H Hospital Road, Concord
Client: EI Australia Pty Ltd
Address: Suite 6.01, 55 Miller Street, Pyrmont NSW 2009
Test Method: AS1289.3.6.1, 2.1.1
Sampling Procedure: Samples Supplied By Client (Not covered under NATA Scope of Accreditation)
Material Description: Silty Clay, pale grey orange brown, trace of sand and gravel

STS / Sample No.: 7694D-L/6
Sample Location: BH 03M
Depth (m): 1.50 - 1.95
Date Sampled: 29/5/23

Project No.: 31380
Report No.: 23/1821
Report Date: 22/06/2023
Page: 2 of 3
Client Project No: E25996.G03



Sieve Size (mm)	Percent Passing (%)
19.0	100.0
13.2	99.2
9.5	98.0
6.7	96.5
4.75	95.5
2.36	94.0
1.18	92.7
0.60	91.5
0.425	91.0
0.30	90.2
0.15	88.9
0.075	87.9

Remarks:

Technician: BV

Approved Signatory.....

Orlando Mendoza - Laboratory Manager

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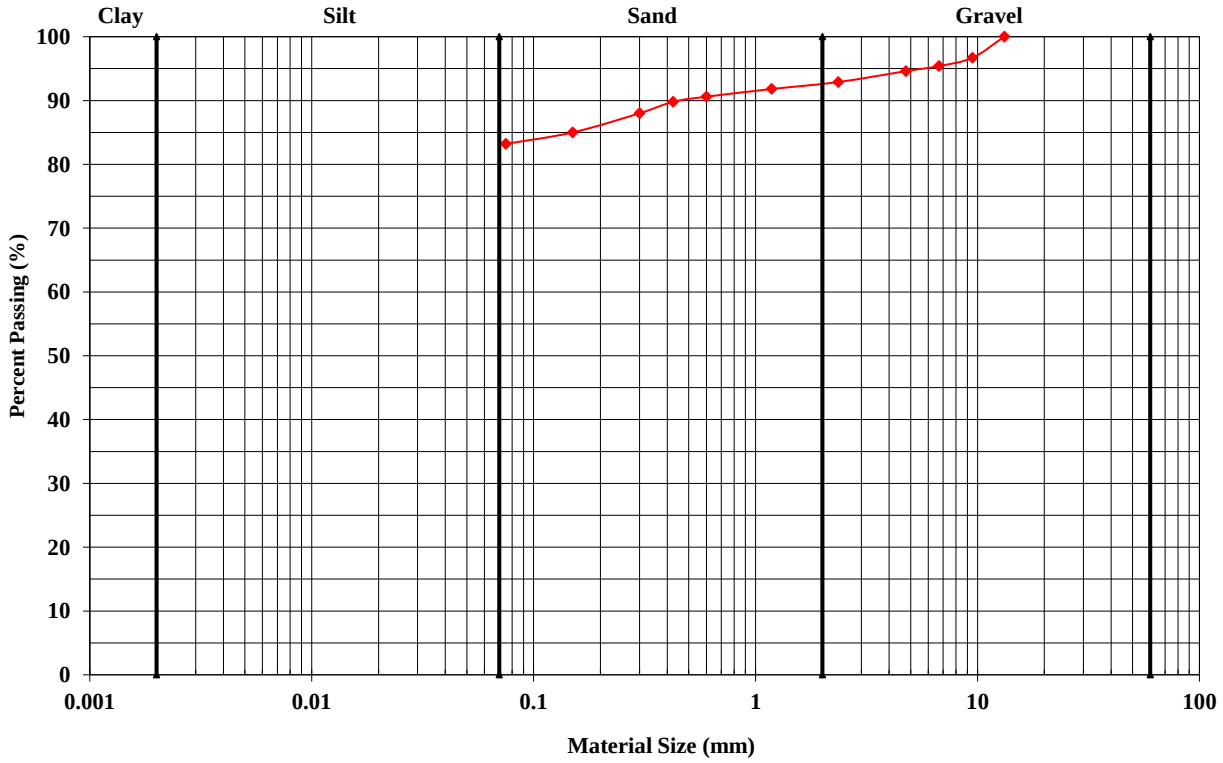
Particle Size Distribution

Project: 1H Hospital Road, Concord
Client: EI Australia Pty Ltd
Address: Suite 6.01, 55 Miller Street, Pyrmont NSW 2009
Test Method: AS1289.3.6.1, 2.1.1
Sampling Procedure: Samples Supplied By Client (Not covered under NATA Scope of Accreditation)
Material Description: Silty Clay, pale grey orange brown, trace of sand and gravel

STS / Sample No.: 7694D-L/8
Sample Location: BH 06M
Depth (m): 1.50 - 1.95
Date Sampled: 29/5/23

Project No.: 31380
Report No.: 23/1821
Report Date: 22/06/2023
Page: 3 of 3
Client Project No: E25996.G03



Sieve Size (mm)	Percent Passing (%)
13.2	100.0
9.5	96.7
6.7	95.4
4.75	94.6
2.36	92.9
1.18	91.8
0.60	90.6
0.425	89.8
0.30	88.0
0.15	85.0
0.075	83.2

Remarks:

Technician: BV

Approved Signatory.....

Orlando Mendoza - Laboratory Manager

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NATA Accredited for Compliance with ISO/IEC 17025 - Testing No. 2750

Point Load Strength Index Report

Project: E25996.G03, 1H Hospital Road, CONCORD, NSW
Client: EI AUSTRALIA
Address: Suite 6.01, 55 Miller Street, PYRMONT
Test Method: AS 4133.4.1
Sampling Procedure: Samples Supplied By Client (Not covered under NATA Scope of Accreditation)

Project No.: 31380/7694D-L
Report No.: 23/1844
Report Date: 23/06/2023
Page: 1 OF 2

Borehole / Sample No.	Depth (m)	Date Sampled	Date Tested	Test Type	Is (MPa)	$Is_{(50)}$ (MPa)	Rock Type	Failure Type	Moisture
BH1M	4.18	29/05/2023	22-23/06/2023	A	**0.2**	**0.2**	SH	3	M
BH1M	5.34	29/05/2023	22-23/06/2023	A	**1.4**	**1.3**	SS	3	M
BH1M	6.07	29/05/2023	22-23/06/2023	A	**1.7**	**1.7**	SS	3	M
BH1M	7.03	29/05/2023	22-23/06/2023	A	**1.6**	**1.6**	SS	3	M
BH2	3.33	29/05/2023	22-23/06/2023	A	**0.06**	**0.059**	SH	3	M
BH2	4.11	29/05/2023	22-23/06/2023	A	**0.3**	**0.31**	SS	3	M
BH2	5.13	29/05/2023	22-23/06/2023	A	**1.1**	**1.1**	SS	3	M
BH2	6.26	29/05/2023	22-23/06/2023	A	**2.9**	**2.8**	SS		
BH4	2.91	29/05/2023	22-23/06/2023	A	**0.3**	**0.3**	SS	3	M
BH4	3.32	29/05/2023	22-23/06/2023	A	**0.14**	**0.14**	SS	3	M
BH4	4.48	29/05/2023	22-23/06/2023	A	**0.49**	**0.51**	SS	3	W
BH4	5.42	29/05/2023	22-23/06/2023	A	**1.2**	**1.3**	SS	3	M
BH7	3.40	29/05/2023	22-23/06/2023	A	**2.6**	**2.7**	SS	3	M
BH7	4.15	29/05/2023	22-23/06/2023	A	**1.1**	**1.1**	SS	3	M
BH7	4.51	29/05/2023	22-23/06/2023	A	**2.2**	**2.2**	SS	3	M
BH7	5.05	29/05/2023	22-23/06/2023	A	**1.5**	**1.5**	SS	3	
BH3M	2.83	29/05/2023	22-23/06/2023	A	**0.25**	**0.25**	SS	3	M
BH3M	3.40	29/05/2023	22-23/06/2023	A	**1.5**	**1.6**	SH	3	M
BH3M	4.03	29/05/2023	22-23/06/2023	A	**0.12**	**0.12**	SH	3	M
BH3M	4.50	29/05/2023	22-23/06/2023	A	**2.7**	**2.7**	SS	3	M
BH5	3.66	29/05/2023	22-23/06/2023	A	**1.2**	**1.3**	SS	3	M
BH5	4.05	29/05/2023	22-23/06/2023	A	**0.98**	**1**	SS	3	M
BH5	4.79	29/05/2023	22-23/06/2023	A	**0.84**	**0.83**	SS	3	M
BH5	5.36	29/05/2023	22-23/06/2023	A	**1.4**	**1.4**	SS	3	M

Failure Type
1 = Fracture through bedding or weak plane
2 = Fracture along bedding
3 = Fracture through rock mass
4 = Fracture influenced by natural defect or drilling
5 = Partial fracture or chip (invalid result)

Test Type
A = Axial
D = Diametrial
I = Irregular
C = Cube

Moisure Condition
W = Wet
M = Moist
D = Dry

Rock Type
SS = Sandstone
ST = Siltstone
SH = Shale
YS = Claystone
IG = Igneous

Remarks:

Approved Signatory.....

Technician: FV

Fernando Velasquez Senior Geotechnician

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Point Load Strength Index Report

Project: E25996.G03, 1H Hospital Road, CONCORD, NSW
Client: EI AUSTRALIA
Address: Suite 6.01, 55 Miller Street, PYRMONT
Test Method: AS 4133.4.1
Sampling Procedure: Samples Supplied By Client (Not covered under NATA Scope of Accreditation)

Project No.: 31380/7694D-L
Report No.: 23/1844
Report Date: 23/06/2023

Borehole / Sample No.	Depth (m)	Date Sampled	Date Tested	Test Type	Is (MPa)	$Is_{(50)}$ (MPa)	Rock Type	Failure Type	Moisture
BH6M	4.24	29/06/2023	22-23/06/2	A	**1.6**	**1.6**	SS	3	M
BH6M	5.12	29/06/2023	22-23/06/2	A	**2.2**	**2.1**	SS	3	M
BH6M	5.90	29/06/2023	22-23/06/2	A	**1.3**	**1.3**	SS	3	M
BH6M	6.63	29/06/2023	22-23/06/2	A	**0.85**	**0.85**	SS	3	M

Failure Type
1 = Fracture through bedding or weak plane
2 = Fracture along bedding
3 = Fracture through rock mass
4 = Fracture influenced by natural defect or drilling
5 = Partial fracture or chip (invalid result)

Test Type
A = Axial
D = Diametrial
I = Irregular
C = Cube

Moisure Condition
W = Wet
M = Moist
D = Dry

Rock Type
SS = Sandstone
ST = Siltstone
SH = Shale
YS = Claystone
IG = I

Remarks:

Approved Signatory.....

Technician: FV

Fernando Velasquez Senior Geotechnician

Appendix C – Vibration Limits

German Standard DIN 4150 – Part 3: 1999 provides guideline levels of vibration velocity for evaluating the effects of vibration in structures. The limits presented in this standard are generally considered to be conservative.

The DIN 4150 values (maximum levels measured in any direction at the foundation, OR, maximum levels measured in (x) or (y) directions, in the plane of the uppermost floor), are summarised in **Table A** below.

It should be noted that peak vibration velocities higher than the minimum figures in **Table A** for low frequencies may be quite 'safe', depending on the frequency content of the vibration and the actual conditions of the structures.

It should also be noted that these levels are 'safe limits', up to which no damage due to vibration effects has been observed for the particular class of building. 'Damage' is defined by DIN 4150 to include even minor non-structural cracking in cement render, the enlargement of cracks already present, and the separation of partitions or intermediate walls from load bearing walls. Should damage be observed at vibration levels lower than the 'safe limits', then it may be attributed to other causes. DIN 4150 also states that when vibration levels higher than the 'safe limits' are present, it does not necessarily follow that damage will occur. Values given are only a broad guide.

Table A DIN 4150 – Structural Damage – Safe Limits for Building Vibration

Group	Type of Structure	Peak Vibration Velocity (mm/s)			
		At Foundation Level at a Frequency of:			Plane of Floor of Uppermost Storey
		Less than 10 Hz	10 Hz to 50 Hz	50 Hz to 100 Hz	All Frequencies
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
2	Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Group 1 and 2 and have intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8

Note: For frequencies above 100 Hz, the higher values in the 50 Hz to 100 Hz column should be used.

Appendix D – Important Information

Important Information

SCOPE OF SERVICES

The geotechnical report ("the report") has been prepared in accordance with the scope of services as set out in the contract, or as otherwise agreed, between the Client And EI Australia ("EI"). The scope of work may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

RELIANCE ON DATA

EI has relied on data provided by the Client and other individuals and organizations, to prepare the report. Such data may include surveys, analyses, designs, maps and plans. EI has not verified the accuracy or completeness of the data except as stated in the report. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations ("conclusions") are based in whole or part on the data, EI will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to EI.

GEOTECHNICAL ENGINEERING

Geotechnical engineering is based extensively on judgment and opinion. It is far less exact than other engineering disciplines. Geotechnical engineering reports are prepared for a specific client, for a specific project and to meet specific needs, and may not be adequate for other clients or other purposes (e.g. a report prepared for a consulting civil engineer may not be adequate for a construction contractor). The report should not be used for other than its intended purpose without seeking additional geotechnical advice. Also, unless further geotechnical advice is obtained, the report cannot be used where the nature and/or details of the proposed development are changed.

LIMITATIONS OF SITE INVESTIGATION

The investigation programme undertaken is a professional estimate of the scope of investigation required to provide a general profile of subsurface conditions. The data derived from the site investigation programme and subsequent laboratory testing are extrapolated across the site to form an inferred geological model, and an engineering opinion is rendered about overall subsurface conditions and their likely behaviour with regard to the proposed development. Despite investigation, the actual conditions at the site might differ from those inferred to exist, since no subsurface exploration program, no matter how comprehensive, can reveal all subsurface details and anomalies. The engineering logs are the subjective interpretation of subsurface conditions at a particular location and time, made by trained personnel. The actual interface between materials may be more gradual or abrupt than a report indicates.

SUBSURFACE CONDITIONS ARE TIME DEPENDENT

Subsurface conditions can be modified by changing natural forces or man-made influences. The report is based on conditions that existed at the time of subsurface exploration. Construction operations adjacent to the site, and natural events such as floods, or ground water fluctuations, may also affect subsurface conditions, and thus the continuing adequacy of a geotechnical report. EI should be kept appraised of any such events, and should be consulted to determine if any additional tests are necessary.

VERIFICATION OF SITE CONDITIONS

Where ground conditions encountered at the site differ significantly from those anticipated in the report, either due to natural variability of subsurface conditions or construction activities, it is a condition of the report that EI be notified of any variations and be provided with an opportunity to review the recommendations of this report. Recognition of change of soil and rock conditions requires experience and it is recommended that a suitably experienced geotechnical engineer be engaged to visit the site with sufficient frequency to detect if conditions have changed significantly.

REPRODUCTION OF REPORTS

 Where information from the accompanying report is to be included in contract documents or engineering specification for the project, the entire report should be included in order to minimize the likelihood of misinterpretation from logs.

REPORT FOR BENEFIT OF CLIENT

The report has been prepared for the benefit of the Client and no other party. EI assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of EI or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own inquiries and obtain independent advice in relation to such matters.

OTHER LIMITATIONS

EI will not be liable to update or revise the report to take into account any events or emergent circumstances or fact occurring or becoming apparent after the date of the report.